

# RESULTS OF THE COGNITIVE INTERVIEWING STUDY TO EXAMINE PROPOSED BROAD ENVIRONMENT AND ASSISTIVE DEVICE UTILIZATION QUESTIONS FOR THE MODEL DISABILITY SURVEY

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This report presents findings of a cognitive interviewing study which evaluated the performance of proposed questions for the World Health Organization's (WHO) Model Disability Survey (MDS). This study examined the constructs captured by each question, and determined whether question ordering impacts respondent interpretation, thereby impacting the constructs captured by each question. The specific research questions for the overall cognitive interviewing study were:

1. What constructs are the functioning questions capturing?
  - a. Are respondents adding appraisal into their reasoning?
  - b. Are the functioning questions acting like performance or capacity?
  - c. Do 'problem' functioning questions act differently than 'difficulty' capacity questions?
2. Does question ordering impact the construct captured by the functioning questions? If, so in what ways?
3. What constructs are the broad environment questions capturing?
4. Does question ordering impact the construct captured by the broad environment questions? If, so in what ways?

While the overall cognitive interviewing study investigated all of the above research questions, this report focuses specifically on the Broad Environment (BE) and Assistive Aid/Device Utilization (AA) sections of the MDS. Here, two of the above research questions are addressed: Research Question 3 (the examination of what the broad environment and assistive device utilization questions capture) and Research Question 4 (the examination of whether section ordering, specifically the placement of health condition questions prior to the functioning section, impacts respondent interpretation of these broad environment questions). The evaluation of the Functioning and Capacity sections of the MDS are reported on elsewhere (Miller and Scanlon, 2015). Furthermore, Miller and Scanlon (2015) also details the methodology used in this cognitive interviewing project.

This report combines the data and findings from both the National Center for Health Statistics' Questionnaire Design Research Lab (QDRL) and the University of Michigan's Institute for Social Research's (ISR) cognitive interviewing samples. Both institutions worked in concert to insure that the methodologies used in each organization's evaluation effort were consistent so that a joint analysis was possible.

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## METHODS

### *Cognitive Interviewing*

The aim of a cognitive interviewing study is to investigate how well survey questions perform when asked of respondents, that is, if respondents understand the questions according to their intended design and if they can provide accurate answers based on that intent. As a qualitative method, the primary benefit of cognitive interviewing is that it provides rich, contextual insight into the ways in which respondents 1) interpret a question, 2) consider and weigh out relevant aspects of their lives and, finally, 3) formulate a response based on that consideration. As such, cognitive interviewing provides in-depth understanding of the ways in which a question operates, the kind of phenomena that it captures, and how it ultimately serves the scientific goal. Findings of a cognitive interviewing project typically lead to recommendations for improving a survey question, or results can be used in post-survey analysis to assist in data interpretation.

Cognitive interviewing studies are performed by conducting in-depth, semi-structured interviews with a small, purposive sample. Respondents are not selected through a random process, but rather are selected for specific characteristics that may be relevant to the type of questions being examined. The typical interview structure consists of respondents first answering the evaluated question and then answering a series of follow-up probe questions that reveal what respondents were thinking and their rationale for that specific response. Through this semi-structured design, various types of question-response problems, such as interpretive errors or recall accuracy, are uncovered—problems that often go unnoticed in traditional survey interviews. By asking respondents to provide textual verification and the process by which they formulated their answer, elusive errors are revealed.

The general process for analyzing cognitive interview data involves synthesis and reduction—beginning with a large amount of textual data and ending with conclusions that are meaningful and serve the ultimate purpose of the study. For analysis of cognitive interviews, reduction and synthesis can be conceptualized within five incremental steps—conducting interviews, producing summaries, comparing across respondents, comparing across subgroups of respondents, and reaching conclusions. These steps are iterative; varying levels of analysis typically occur throughout the qualitative research process. As each step is completed, data are reduced such that meaningful content is systematically extracted to produce a summary that details a question’s performance. In doing so, it is possible to understand the ways in which a question is interpreted by various groups of respondents, the processes through which respondents formulate their responses, as well as any difficulties which respondents might experience when attempting to answer the question.

### *WHO MDS Cognitive Interviewing Study*

For this report, two of the study’s four analytic purposes are considered:

- 1) To examine what domains the broad environment and assistive device utilization questions capture.
- 2) To examine whether section ordering, specifically the placement of Health Condition Section prior to the Broad Environment section, impacts respondent interpretation of the environment questions, thereby impacting the constructs captured by each question.

In order to study the ordering effects, two versions of the questionnaire were created using identical questions, but with different organization of the sections. The orders of the two versions are presented below:

|                         |                         |
|-------------------------|-------------------------|
| <u>Version A</u>        | <u>Version B</u>        |
| Broad Environment       | Health Conditions       |
| Assistive Devices/Aides | Capacity                |
| Functioning             | Assistive Devices/Aides |
| Health Conditions       | Broad Environment       |
| Capacity                | Functioning             |

Because of the length of the questionnaire, not all questions proposed for the Model Disability Survey could be examined. The QDRL and the ISR chose a sub-set of questions from the full proposed MDS that covered a wide range of domains of interest. For the broad environment questions, these domains included healthcare facilities, commercial facilities, personal dwellings, and transportation.

Sixty face-to-face cognitive interviews were conducted by the QDRL and the ISR throughout June 2014. Each organization conducted 30 interviews. Thirty one respondents were placed in the sample examining the performance of Version A, while 29 respondents were placed in the sample examining Version B. Interviews lasted one hour. During the interview, respondents were asked a survey item and were then asked to explain their answer. The types of follow-up questions asked by interviewers depended on respondents’ interpretation of the questions as well as their health status and physical abilities. However, typical follow-up questions included, “How so?” and “Why do you say that?”

### *Respondents*

The demographic breakdown of respondents appears in the tables below. Respondents were recruited through newspaper advertisements, flyers and by contacting previous respondents who met the criteria of this study. A screening process was employed over the telephone to determine the caller’s eligibility for participation. Because questions focused primarily on respondents’ abilities and physical conditions, particular effort was made to recruit individuals with a variety of health conditions.

**Table 1: Distribution of Respondents’ Races by Questionnaire Version (QDRL ONLY)<sup>3</sup>**

|              | <b>Version A</b> | <b>Version B</b> |
|--------------|------------------|------------------|
| <b>Asian</b> | 1                | 0                |
| <b>Black</b> | 5                | 7                |
| <b>White</b> | 9                | 9                |

<sup>3</sup> Only the QDRL at NCHS collected the self-identified race of the respondents. Additionally, NCHS collected ethnicity, with all 30 respondents indicating that they were “non-Hispanic.” Neither race nor ethnicity is available for the ISR respondents.

**Table 2: Distribution of Respondents' Ages by Testing Organization and Questionnaire Version**

| Age                | Version A |     | Version B |     |
|--------------------|-----------|-----|-----------|-----|
|                    | QDRL      | ISR | QDRL      | ISR |
| <b>18-29</b>       | 0         | 2   | 2         | 3   |
| <b>30-49</b>       | 3         | 4   | 1         | 1   |
| <b>50-64</b>       | 4         | 8   | 4         | 5   |
| <b>65 and Over</b> | 8         | 2   | 9         | 4   |
| <b>Missing</b>     | 0         | 0   | 0         | 1   |

**Table 3: Distribution of Respondents' Genders by Testing Organization and Questionnaire Version**

| Gender             | Version A |     | Version B |     |
|--------------------|-----------|-----|-----------|-----|
|                    | QDRL      | ISR | QDRL      | ISR |
| <b>Female</b>      | 6         | 8   | 9         | 7   |
| <b>Male</b>        | 9         | 8   | 6         | 6   |
| <b>Transgender</b> | 0         | 0   | 0         | 1   |

**Table 4: Distribution of Respondents' Educational Attainment by Testing Organization and Questionnaire Version**

| Educational Attainment | Version A |     | Version B |     |
|------------------------|-----------|-----|-----------|-----|
|                        | QDRL      | ISR | QDRL      | ISR |
| <b>High School</b>     | 1         | 3   | 1         | 4   |
| <b>Some College</b>    | 4         | 4   | 4         | 2   |
| <b>College Degree</b>  | 2         | 6   | 5         | 6   |
| <b>Graduate Degree</b> | 8         | 3   | 6         | 2   |

### *Method of analysis*

Analysis of interviews was performed in the manner briefly above, and detailed in Miller et al (2014). After an interview was conducted, transcripts or summary notes were written for each question. Transcripts were created from video-recordings of interviews, which also ensured the accuracy of summaries and soundness of study conclusions. Summary notes included the way in which a respondent interpreted and processed individual questions, what experiences or perceptions the respondent included as they formulated their answer, and any response difficulties experienced by the respondent.

After all interviews and summaries were completed, these notes and transcripts were compared to identify common patterns of interpretation and response difficulties for each question. Emergent interpretations were coded and analyzed both within and across the two questionnaire versions. To examine potential ordering effects, themes identified in a specific question were compared to the same question in the other version. For example, themes identified in the Version A health facility broad environment question were compared to the themes identified in the Version B health facility broad environment question.

In addition to the themes that emerged within the various questions, each respondent was assigned a disability status based on the holistic information captured by the cognitive interview. A full explanation of the assignment protocol is included in Appendix A. Briefly, respondents were either assigned to one of four conditions (“physically disability,” “mentally disability,” “both” or “no disability”) based not only on their survey answers, but also their responses to probe questions in the Health Conditions, Functioning, and Capacity Sections of the questionnaires.

A data entry and analysis software application (Q-Notes) was used to conduct analysis. Q-Notes, developed by the QDRL, ensures systematic and transparent analysis across all cognitive interviews as well as provides an audit trail depicting the way in which findings are generated from the raw interview data. Because of time limitations, not all questions were asked of all respondents. Additionally, some of the narrative explanations were less complete than others. Findings of this study are based on complete narratives; incomplete cases were excluded.

The next section of this report presents the findings. First overall, cross-question themes are discussed, followed by a question-by-question analysis. Each question’s analysis includes a discussion of the constructs captured by the question, the differences observed across the questionnaire versions, and the difference observed across disability statuses.

## SUMMARY OF FINDINGS

The Broad Environment and Assistance Aid/Device Utilization questions demonstrated the following characteristics which indicate problems with question performance:

1. Respondents interpreted both what the questions were asking about, and how they should judge their responses to the questions in a wide variety of ways.
2. Respondents expressed confusion over the questions’ key terms and constructs—particularly those respondents without a physical disability.
3. Respondents with a physical disability and respondents without a physical disability tended to *interpret* the questions differently, but not necessarily *answer* the questions differently. Thus a response of “very hard” to a question about one’s healthcare facility meant two very different things to two different respondents.
4. The framing effects of the rest of the MDS survey clearly impacted both how respondents interpreted what the questions were asking about, and how they should judge their responses to these questions. Thus, this section *could not function as a stand-alone module*.

The great inconsistency with which the respondents answered these questions indicates that these two sections do not capture any concept (or set of concepts) effectively or well—regardless of the intent of the questions. Instead, they place an undue burden on the respondents that could have clear methodological consequences—including drop-outs, item and unit non-response, and the loss of data validity due to response errors.

Besides the problematic nature of these two sections, there are three cross-question themes that deserve additional discussion: the overall response pattern respondents used to answer both the broad

environment and assistance aid questions, the interpretative variability surrounding the term “accessibility,” and the cross-version differences due to the framing effects of presenting the question sections in different orders.

### Overall Complex Response Process

While there are some differences in how the respondents answered the various Broad Environment (BE) and Assistive Aid/Device Utilization (AA) questions, the questions are all structured similarly and the respondents tended to follow the same response pattern across all of them. This response process is illustrated in Figure 1:

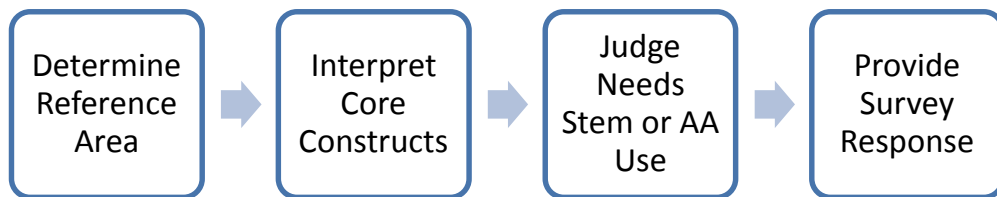


Figure 1: Overall Response Process for Both the Broad Environment and Assistive Aid/Device Utilization Questions

Generally speaking, respondents first identified a *reference area*—a geographic boundary within which they would limit their consideration of the questions’ core construct. For example, in the question asking “...how easy or hard does your natural environment of the place you usually live—its temperature, terrain, and climate—make it for you to do the things you need or want to do?” (Question BE6), a respondent might determine that “the place” he “normally lives” is his interior living space. Thus, by deciding that the interior of his home was the reference area, he would continue to answer the question *only thinking about this area*.

After determining this reference area, respondents then interpreted the core construct. In other words, they had to decide what, exactly, the question was asking about. For example, and using the same question as above about the “natural environment of the place you usually live,” the core construct here is “natural environment.” The respondents conceptualized this construct in a variety of ways—for instance some thought about the temperature of “the place [they] usually” lived, some thought about the physical terrain (i.e. the presence or absence of hills), while others thought only about the built (and not *natural*) environment. Some people even considered the other people who lived in their area to be the “natural environment.”

Once they determined how they were defining the construct, they had to determine whether or not their natural environment made their lives easy or hard—in other words, whether it satisfied their needs and wants. Just like interpreting the core construct, there was variation in this judgement step as well—with respondents using more than one way to determine whether or not their natural environment made their lives easy or hard. In the “natural environment” example, some respondents judged their environment on how it helped or hindered their physical movement, while others judged it on how “convenient” they thought it was. Still others judged it on how their environment might affect their health. Note that throughout this report, the phrase “...need or want to do” in the Broad Environment section is referred to as the “needs stem.”

In a few cases the respondents also considered a *reference person*—determining whether or not the question was about themselves or some other people. For instance, in the question asking “...how easy or hard does the transportation you use make it for you to do the things you need or want to do?” (Question BE4), some respondents only thought about themselves, while other respondents thought about hypothetical people (as in, “someone who is disabled might have a hard time on the metro”) or people they knew (as in, “my brother says he doesn’t have a hard time using the bus”).

Each step in the response process requires respondents to decide how they are going to interpret or judge the constructs under question—the various ways the respondents decided to do these are called *patterns of interpretation* or *patterns of judgment*. Throughout this report, these decisions are illustrated as cognitive schema (see, for instance, Figure 2 below, on page 11). These schema are constructed of the various cognitive pathways respondents used to navigate these decision points. For example, Figure 2 shows the cognitive schema that emerged around the respondents’ interpretations of the construct “healthcare facility,” in response to the question “...how easy or hard does your healthcare facility make it for you to do the things you need or want to do?” (Question BE1).

One of the most important aspects of these cognitive schemae are that they may serve as a proxy for the cognitive burden and complexity of a survey question: Questions that have a great number of patterns of interpretation or judgment are more likely to be complex and burdensome; questions with a smaller number of interpretative patterns are more likely to be simple and easy to answer. A more complex question not only has less *construct validity* than simple questions (as respondents will answer the question based on a greater number of interpretations), but also has a greater likelihood of inducing *response error* (if some of those many patterns of interpretation are “out-of-scope,” or measuring aspects of a construct that the survey designers do not want to be measured).

The questions in the two MDS sections reported here on are all very complex and cognitively burdensome—particularly the Broad Environment questions. Consider their syntax: respondents are asked to 1) interpret a construct, 2) determine the geographic confines (the “reference area”) of that construct, 3) judge whether or not the construct helped them do things they “need or want to do,” 4) place that judgment on a 1 to 5 response scale. Each of these decisions can (and did) have multiple patterns of interpretation or judgment, leading to an extremely high number of possible cognitive pathways a respondent could use to answer the survey question.

### **Variation Around the Term “Accessible”**

Across both the Broad Environment and the Assistive Aid questions, respondents used the term “accessibility” (as well as its other forms, such as “accessible”) to explain what they thought the question was asking about to explain how they conceptualized their answers. In fact respondents generally understood the questions, particularly the Broad Environment ones, as *asking whether or not a location or service was accessible*—even though the words “accessible” or “accessibility” were not used in any of the questions’ texts.

However, respondents used, and understood, “accessibility” as a gloss for two *very separate* constructs: convenience and physical accessibility. Respondents who applied the former interpretation considered whether or not something was easy to get to, easy to use, or easy to obtain. For example; in response to the question about their healthcare facility (“...how easy or hard does your healthcare facility make it for you to do the things you need or want to do?”), one respondent explained that she was thinking about how “accessible” her doctor’s office was, understanding accessible as something that is close to her

subway line. On the other hand, the respondents who applied the latter interpretation considered whether or not something could be physically entered, physically traveled to, or physically used. In most cases, these respondents understood accessible to mean that it had handicap modifications, or was ADA<sup>4</sup>-compliant. For instance, another respondent who was answering the question about healthcare facilities determined that the medical complex he usually went to was “accessible” because there were handicap ramps and elevators that he could use.

Importantly, respondents did not always carry their interpretation of “accessability” from one question to another. Thus, while in the question about healthcare facilities one respondent thought about whether or not their doctor’s office was ADA compliant and had things like accessible parking and entrance ramps, this same respondent went on to consider whether or not she had family events that were convenient to attend in the next question (“...how easy or hard does the places you socialization and engage in community activities make it for you to do the things you want or need to do?”). In fact, a few respondents changed their interpretation of “accessability” within a single question—at least two respondents thought about ADA compliance for half of the items on the showcard for Question AA3 and AA4 (“...do you use any of these mobility or self-care aids?” and “...do you need any of these mobility or self-care aids?”, respectively) but thought about convenience for the other half of the items.

All of this is to say that while the term “accessability” might on the surface seem like a straight-forward term to disability researchers within the context of a health and disability survey, this is not necessarily the case for the survey respondents.

### **Cross-Questionnaire Differences**

As detailed above, one version of the questionnaire (Version A) presented the Broad Environment questions first, unframed by anything else (the Assistive Aid questions were framed by the Broad Environment questions). The other version (Version B) presented the Broad Environment questions later in the survey, thus framing them with both the Health Condition and Capacity questions. Cross-questionnaire analysis was performed in order to answer Research Question 4 above—whether or not framing impacts interpretation. In short: It does.

While differences in interpretations and patterns of judgment across the questionnaires are described for each question below, two overall trends emerged from the cross-questionnaire analysis—1) framing reduces variation in interpretation, and 2) framing causes respondents to consider physical locations closer to their selves and their homes.

*Fewer and More Disability-Focused Interpretations with Framing; Wider and Less Disability-Focused Interpretations without Framing:* The first of these two trends is relatively simple: respondents who received Version A (and thus received the Broad Environment questions immediately, without the benefit of the framing provided by the Health Condition and Capacity sections) had a much wider range of interpretations of constructs, a wider range of patterns of judgment, and were much less likely to consider disability than did the respondents who received Version B. Again, respondents do not necessarily know they are answering a survey (or a question set, if the MDS is to be included in existing national surveys) focused on disability or health. Thus, when presented with broad (and often vague)

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<sup>4</sup> The Americans with Disabilities Act (ADA) is a federal law that mandates that certain public buildings have modifications that enable persons with disabilities to use the facilities.



questions to start off with, they will reach for whatever interpretation they can—leading to the wide interpretative variation observed across Version A.

In Version B, however, the respondents understood the general purpose of the survey by the time they reached the Broad Environment questions, and as a result had a much tighter set of interpretations. Specifically, these respondents who received the framed Version B were much more likely to interpret and judge the environment questions through a “disability lens” (interpreting “accessability,” for instance as physical accesability, and not convenience) than were those respondents who received the unframed Version A of the questionnaire.

*Responses Based Closer to the Respondents’ Living Spaces with Framing; Responses Based Further Afield without Framing:* The second trend follows the previous one where the unframed Version A produced wider interpretations as compared to Version B, which was framed by the Health Conditions and Capacity sections. That pattern is acute in very specific cognitive domain: the reference area. Since a number of questions asked respondents to consider geography (i.e. “your neighborhood” in the third Broad Environment question or “natural environment” in the sixth), they often had to determine a reference geography within which the construct the question asked about would occur. Across the Broad Environment questions, these reference geographies ranged from one’s living space to one’s metropolitan area. In the analysis, the following levels of geography were applied to the respondents’ answers:

- |    |                                  |  |
|----|----------------------------------|--|
| 1. | Living Space                     |  |
| 2. | Building or Property             |  |
| 3. | Respondent’s Street or Neighbors |  |
| 4. | Respondent’s Neighborhood        |  |
| 5. | Respondent’s Town or City        |  |
| 6. | Respondent’s Region              |  |

This set of geographies exists on a continuum, and goes from the closest to the respondent’s home or self (living space) to the furthest afield (the region as a whole).

Overall, respondents who received the unframed Version A were much more likely to consider not only a wider set of geographies, but also to consider ones that were further from the self. On the other hand, respondents who received Version B not only had a tighter interpretation of the geography, but also tended to consider areas closer to their home.

## FINDINGS BY QUESTION

All questions in the Broad Environment (BE) section use the following answer categories, which were presented to the respondents on a show card:

1. Very Easy
- 2.
- 3.
- 4.
5. Very Hard
6. Does Not Apply

Each of the question analyses detailed below includes a description and discussion of the range of interpretations of both the core construct (i.e. the subject matter of the question) and the judgment of the “needs stem” (the “need or want to do...” phrase found in all of the Broad Environment questions). Following this, each question write-up also includes a disability analysis and a cross-questionnaire analysis. The former will explore the variation in how the question functioned across the various respondent disability classifications detailed in Appendix A. The latter will explore the differences between how the question preformed in Version A (where the BE questions were unframed by any other section) and in Version B (where the BE questions were framed by the Health Condition and Capacity Sections). Additionally, reference *areas* and reference *people* are discussed when appropriate.

**Question BE1: Using the scale on show card X, how easy or hard does your health care facility make it for you to do the things you need or want to do?**

Question BE1 was problematic for several reasons: the respondents not only expressed a lot of confusion (particularly over the term “health care facility”), but also interpreted both the core construct and the phrase “need or want to do” in a wide variety of ways. Overall, nearly half of the sample indicated in one way or another that they did not understand the question or requested clarification. Respondents interpreted “health care facility” in four separate ways—by thinking about a single facility, multiple facilities, their healthcare providers, or long-term care arrangements. Additionally, respondents based their judgment of the healthcare facilities’ satisfaction of their needs or wants on either convenience (such as travel time or ability to schedule an appointment quickly) or, less frequently, on physical accessibility to the facilities.

*Core Construct Interpretations:* The interpretation of the core construct of “health care facility,” varied a lot across the respondents. The response schema showing the various patterns of interpretation the respondents used to arrive at their conception of a “health care facility” is shown below in Figure 2.

Many respondents immediately considered either their healthcare provider (instead of a location or facility) or a single healthcare facility location. For instance, one respondent who answered “1 very easy” to Q BE1 thought of her healthcare provider and explained, “I was thinking about Kaiser as the big...not just the facility I go to. The whole [thing]” Another respondent (who also answered “1 very easy), who illustrates the “single location” pattern of interpretation, simply said, “I’m thinking about the VA hospital.” A number of the respondents in the ISR sample followed this pattern, thinking about the university hospital as their “health care facility.”

Other respondents expressed (often times explicitly) confusion over which healthcare facility they should be answering about. For example, one respondent who received Version A explained that she was not sure what he was supposed to be thinking about:

Are you talking about a doctor’s office? My hospital? Facility...what’s the facility? I go to various doctor’s offices...I have no idea what you want from me.

Eventually, these respondents chose one of three patterns of interpretation: they focused on a single location, they answered based on some combination of multiple health care locations and providers, or they considered the care they received in their place of residence because of long-term care needs. For instance, the woman quoted above ended up thinking about both her hospital and her doctor’s office, and answered with a “4” response, explaining that she could not always get an appointment quickly, she would prefer more magazines in the waiting area, and that it sometimes requires multiple calls to get her prescriptions renewed. Additionally, a few respondents were unable to decide on a pattern of interpretation and simply indicated that they could not answer the question because they did not understand what it was asking about.

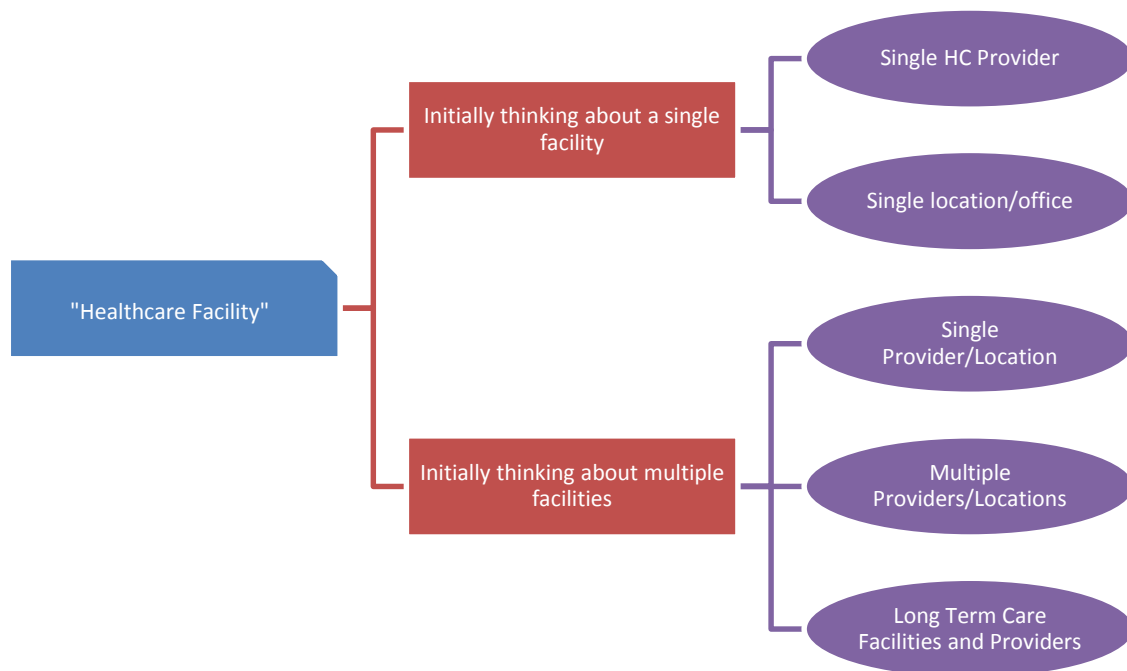


Figure 2: Cognitive Schema of the Interpretation of Question BE1

*Judgment of the Needs Stem:* After determining what healthcare facility (or provider) they were considering, respondents moved on to interpret “needs and wants.” In this question (as well as all the other Broad Environment questions), respondents typically did not distinguish between necessity (“needs”) and desire (“wants”). Generally, respondents understood the needs stem to mean healthcare services, such as check-ups, medical treatments, and prescription refills. One woman did not think of the help her healthcare facility gave her, but rather how her health insurance company either aided or prevented her from getting the care she needed:

Because it’s like the things I need to do I get a note of what I need to do. But when it comes down to actually helping me do these things all you get is a piece of paper. Say for

example, with my insurance I was covered through everything. Once I fell injured myself and my teeth, they switched me over to a different insurance that doesn't cover me fully....It's like I didn't give you the right to do that.

Those respondents who interpreted the needs stem as health care services largely based their responses on the ideas of accessibility, availability of services, and hassle. This included parking availability, elevator access, physical proximity to their place of residence, transportation difficulties in getting to the facility, amount of paperwork, and insurance transparency.

A few respondents viewed this construct to be unrelated to the actual health care services. For instance, a female respondent said that she desired “reading material and a television” at her facility, but did not mention her facility’s ability to provide medical services.

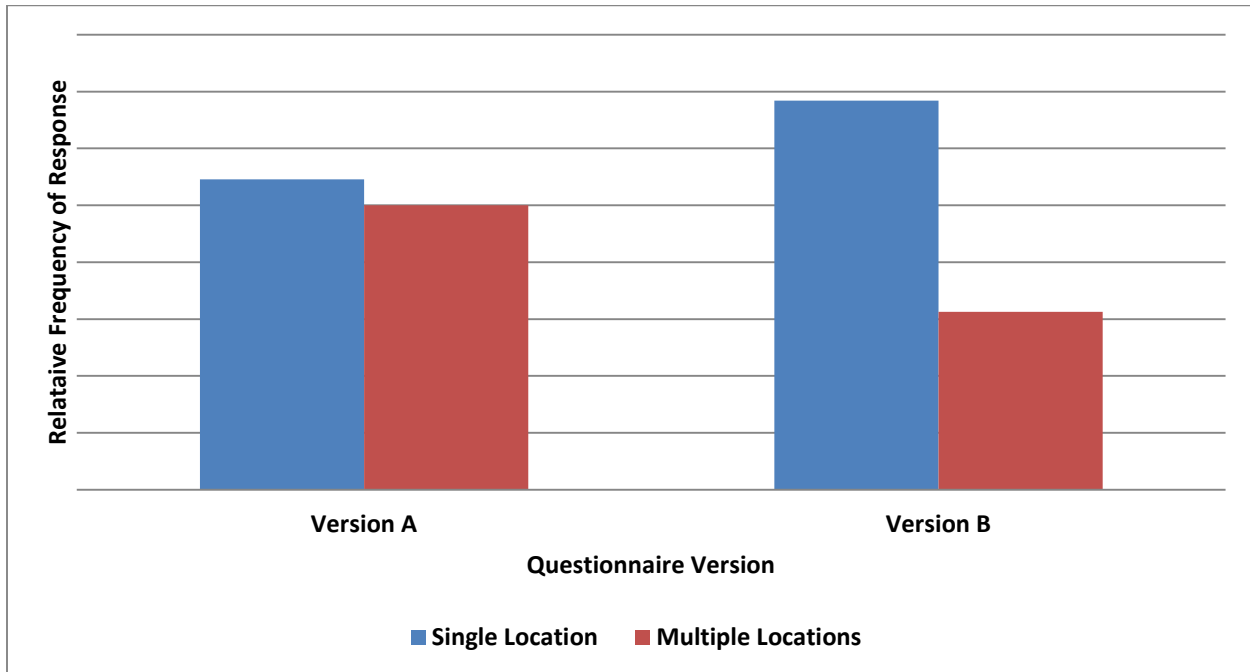
*Disability Analysis:* Across both versions of the survey, the disabled population was more likely to answer Q BE1 using a negative answer category than the non-disabled population. In particular, the respondents categorized as “physically disabled” (again, see Appendix A) were more likely to report difficulty with their health care facility, independent of the questionnaire version.

There is no major difference between the physically disabled or not physically disabled respondents in how they interpret “health care facilities” (though there is a difference between the versions, as explained below). Additionally, there appears to be no correspondence between disability status and whether or not respondents expressed difficulty with the question. However, a difference did emerge as the respondents moved to the judgment phase. Those respondents who were coded as physically disabled were more likely to base their judgment on physical accessibility criterion--such as handicapped parking availability. Respondents who were not coded as physically disabled mainly considered convenience—such as scheduling, transportation, and physical proximity with relation to their residence—when judging their survey response.

*Cross-Questionnaire Analysis:* While the actual survey responses across the two versions appear similar, as noted above, this question does not consistently capture any one interpretation of “health care facility.” Across both questionnaire versions, some respondents were not able to provide an answer because they were unable to generate a construct for “health care facility;” in other cases respondents gave a middle-of-the-road response due to the same reasoning. In particular, more respondents in Version A (the version without the framing) struggled in determining a definition for “health care facility” than those in Version B. In fact, 17 out of the 31 Version A respondents verbally expressed confusion compared to only 8 out of 29 Version B respondents. The fact that so many more Version A respondents expressed confusion over this question—the very first question they received—as compared to the Version B respondents indicates that ordering and framing effects do indeed matter for the broad environment questions.

Respondents from Version A interpreted “health care facility” using both the single and multiple location pathways. However Version B respondents were much more likely to only use the singular location pathway, as seen in Chart 1 below:

Chart 1: Questionnaire Version by Response Pathway for Question BE1



As noted above, respondents who were coded as “physically disabled” were more likely to consider physical accessibility during the judgment phase than everyone else in the sample. However, this trend displayed a strong framing effect. The physically disabled respondents who received Version B (which, again, framed the environment questions with both the Health Condition and Capacity sections) tended to focus *exclusively* on physical accessibility, while in Version A (where the environment questions were unframed) they tended to think about physical accessibility *in addition* to things such as scheduling convenience and bus routes.

Overall, Question BE1 captured a wide variety of interpretations of “health care facility,” and to a lesser extent, interpretations of the phrase “wants and needs.” This diversity was slightly greater in Version A than Version B—as can be seen across the core construct in Chart 1 above. There were some interpretive differences between respondents with and without physical disabilities, and these differences were affected by framing.

**Question BE2: Using the scale on show card X, how easy or hard does the places you socialize and engage in community activities make it for you to do the things you want or need to do?**

Both the core construct of “places you socialize and engage in community activities” and the needs stem “things you want or need to do” were interpreted inconsistently by the respondents. Respondents considered both places *and* activities when answering this question, and were more likely to think about whether or not that place or activity was convenient to get to than they were to consider whether or not that place had any accessibility features. This was true not only for respondents who were not physically disabled, but also for those respondents who were physically disabled. Furthermore, a strong framing effect was detected. Respondents who received the unframed Version A of the questionnaire

were much more likely to consider whether both the convenience and the physical accessibility of a place or activity met their needs; whereas those respondents who received the framed Version B of the questionnaire were much more focused in their judgment, largely considering only the convenience of a place.

*Core Construct Interpretations:* The largest amount of variation emerged from the interpretation of the core construct—the places where socialization and community engagement occurred. Table 5 below shows the range of interpretations of the core construct across both questionnaire versions:

**Table 5: Question BE2 Core Construct Interpretations**

|                                       | <b>Version A</b> | <b>Version B</b> |
|---------------------------------------|------------------|------------------|
| <b>Arts Events</b>                    | ●                |                  |
| <b>Family Events</b>                  | ●                | ●                |
| <b>Library</b>                        | ●                | ●                |
| <b>Movie Theatre</b>                  | ●                |                  |
| <b>Neighborhood</b>                   | ●                | ●                |
| <b>Recreation or Community Center</b> | ●                | ●                |
| <b>Place of Worship</b>               |                  | ●                |
| <b>Restaurant</b>                     | ●                | ●                |
| <b>Senior Center</b>                  | ●                | ●                |
| <b>Store</b>                          | ●                | ●                |
| <b>Work</b>                           | ●                |                  |
| <b>Volunteering</b>                   |                  | ●                |
| <b>Unspecified “Going Out”</b>        | ●                | ●                |

Some respondents even considered the construct to simply mean “going out.” For instance, one woman was just thinking about getting out of her house and going to the grocery store as her “social engagement.” Overall, the respondents appeared to largely be considering places they enjoyed being—whether or not it was a place that they “socialized or engaged in community activities” in any sort of formalized way. In this way, the question that the respondents appeared to be actually answering was:

*How easy or hard do the places you enjoy going make it for you to do the things you need or want to do?*

*Judgment of the Needs Stem:* Further variation emerged around the respondents’ interpretation of the needs stem, which they interpreted in two ways: the convenience or ease of getting to the place and its physical access. One group of respondents based their response primarily on the place of interest’s physical location and how easy or hard it was for them to get there via their available forms of transportation. For example, one respondent who employed this pattern said, “And again, I have a vehicle that I’m able to drive myself.” Another respondent explained:

I’m close to the metro also...I can walk basically downtown. I can walk to the Giant...and everything is convenient for me there...It’s easier to walk than to take the bus—[I have to] wait like half an hour!

The other group of respondents considered the physical accessibility of the place. An example of this would be a respondent (who answered “3”) who claimed that “... it’s an accessible building with elevators. It’s just that if I get in late it’s hard to get in because they lock the doors.” Likewise, another respondent who answered “3” was thinking about distances she had to walk and whether or not she has to climb stairs:

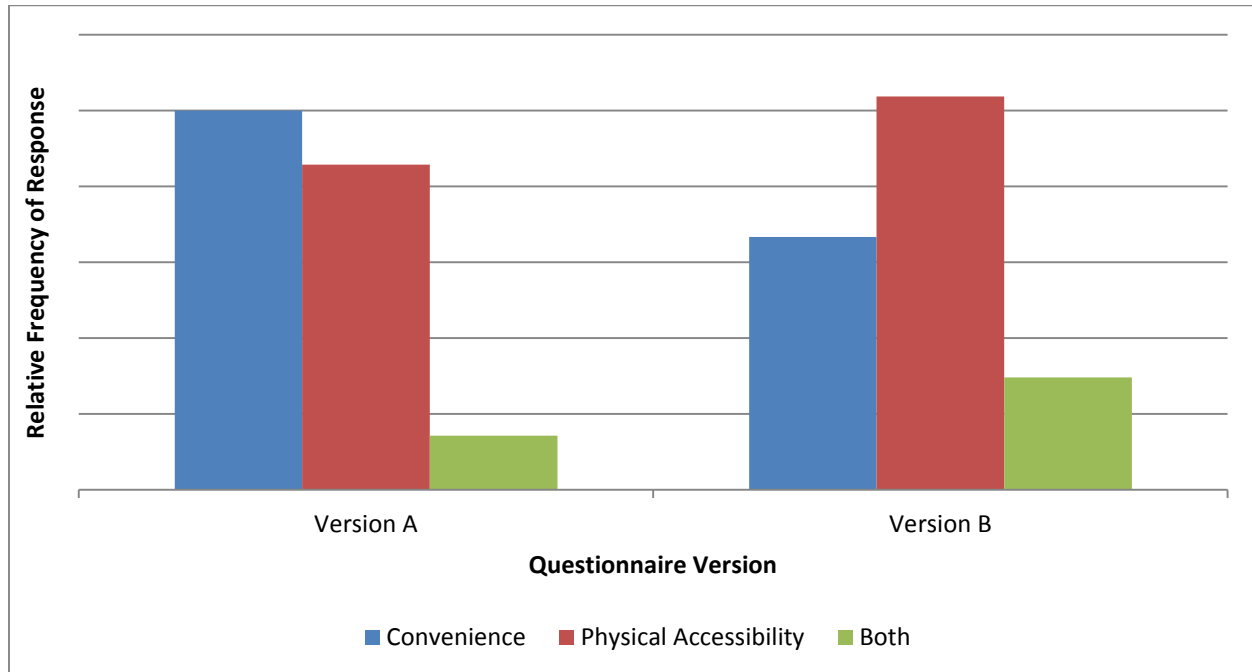
About three. Often it’s hard to find close parking and there are stairs and distances [to walk] as it was here when I parked. Like your facility here. I had to park in the parking garage and then walk down three flights of stairs.

The respondents did not always think about these patterns independently. For instance, a physically disabled respondent explained her response by talking about how her community provided her with assistive transportation from her home to the point of interest as well as how these places provided her with “... ramps and handicapped buttons,” indicating that these two interpretations are not mutually exclusive and that a third pattern of judgment—a mix of the two other patterns—exists as well. Clearly an individual’s interpretation of the needs stem will be at least partially dependent on their previous interpretation of the core construct “place.” For instance, a respondent who went to and was thinking about a parade in their community they attended organized by the larger community might not consider handicapped doors and ramps. Conversely, a respondent who was considering a building that was used as a meeting spot for some activity might consider the building’s characteristics in its response.

*Disability Analysis:* Across both versions of the survey, physically disabled respondents were once again more likely to provide unfavorable responses to the survey question. However, there was no distinguishable difference in how they interpreted either the core construct or the needs stem from the non-physically disabled respondents.

*Cross-Questionnaire Analysis:* Unlike some of the other broad environmental questions, the number of interpretations of the core construct did not diverge much across the two questionnaire versions—both versions captured a similar number of interpretations of “places to socialize and engage in community,” as seen in Table 5 above. A noticeable difference did emerge between the two questionnaire versions in the judgment step when the respondents interpreted accessibility. As seen in Chart 2 below, in Version A the respondents tended to use both interpretations of accessibility evenly. However, In Version B, the respondents were much more likely to interpret accessibility as physical accessibility, and tended to think less about the ease of places they were socializing.

Chart 2: Questionnaire Version by Interpretation of "Accessibility" for Question BE2



Therefore, the same general framing effect observed previously in Q BE1 continues here in Q BE2: the framing provided by the Health Status and Capacity Sections of the MDS focus the respondents' interpretations and judgments while responding to the environment questions.

**Question BE3: Using the scale on show card X, how easy or hard does the shops, banks and post office in your neighborhood make it for you to do the things you need and want to do?**

The overall response to Question BE3 was mixed. There was very little variation which core constructs the respondents considered—with most respondents thinking just about the specific locations given in the question text (shops, banks, and post offices). However, respondents again did not agree on what the phrase “need or want to do” referred to, nor did they all think the same range of geographies when considering their answer. While there was not much variation between how physically disabled and non-physically disabled respondents answered Q BE3, there were differences between how respondents who received the unframed Version A of the questionnaire responded to the question in comparison to those who received Version B. In fact, much of the interpretive variation that emerged from this question appears to be due to the fact that Version A respondents did not have enough context with which to focus their responses.

*Reference Area:* Most respondents interpreted “neighborhood” in a similar way. As noted above in the Summary of Findings Section, the range of interpretations for the reference area extended from a respondent’s living area to their neighborhood to their region. In Q BE3, most respondents were thinking about their town—probably as a result of the question text including “post office.” Since most towns have one (or just a few) post offices, respondents likely associate a place such as a post office with a town level of geography.



However, some respondents deviated from this town level of geography, with a number focusing on their metropolitan region as a whole. The questionnaire versions differed on this point, which will be discussed further below. Suffice to say here that both the range of interpretations of “neighborhood,” as well as how far afield the respondents considered, was greater in Version A than in Version B.

*Core Construct Interpretations:* There was very little variation in the interpretation of the core constructs “shops, banks, and post office.” As might be expected, most respondents thought about post offices—certainly due in large part to the fact that it was the last example the respondents heard in the question text. In addition to the three specific places cited in the text, respondents also considered grocery stores, movie theatres, and transit stops. Overall, the respondents appeared to understand the question as asking about “physical locations of commerce or services outside the home.” In fact, one respondent explicitly excluded shopping she does online at home, saying: “No I don’t do any shopping. Everything is [online].”

*Judgment of the Needs Stem:* While the interpretations of the core constructs did not vary much across the sample, a large amount of variation emerged from how respondents judged their “needs and wants.” As can be seen in the visualization of the response schema below, after respondents interpreted the core constructs, they then judged those places on either their convenience or their physical accessibility.

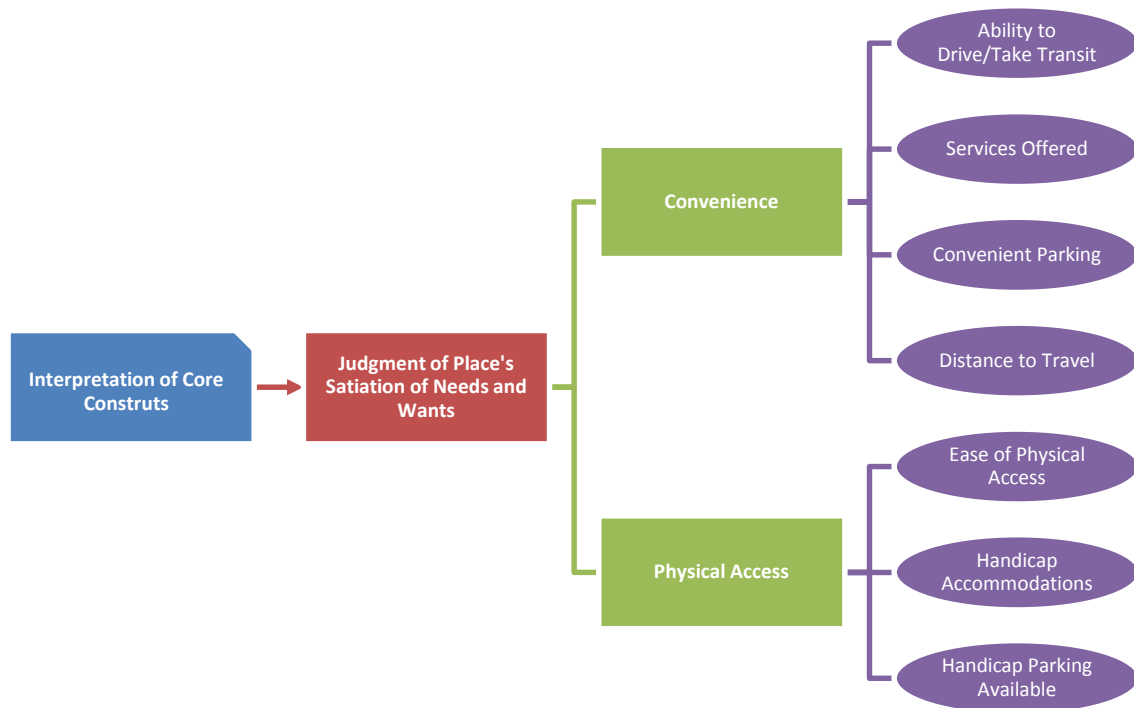


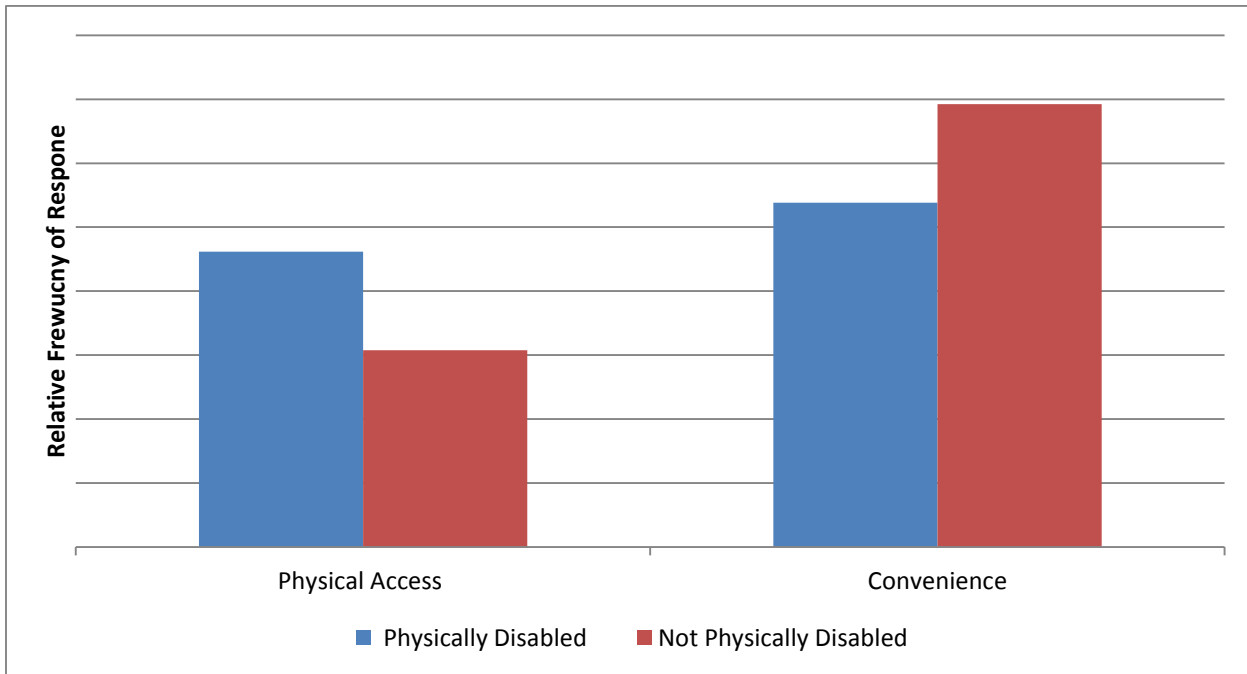
Figure 3: Cognitive Schema of the Judgment of Question BE3

Respondents tended to consider either a place’s convenience or its physical access, but not both of these pathways together. This process is in opposition to how the respondents approached the judgment step in the previous question, Q BE2, where a number of respondents considered *both* physical accessibility *and* convenience. However, within both of these two pathways, respondents tended to consider more than one aspect of either convenience or physical access. For instance, one respondent considered convenience, and explained that he had access to a number of services within a short distance, and that he was able to use transit to get to them:

I work at George Mason University and a lot of the things I need to do or want to do are right on campus... They have transportation on campus and to the metro center. And it's very close to a shopping center...

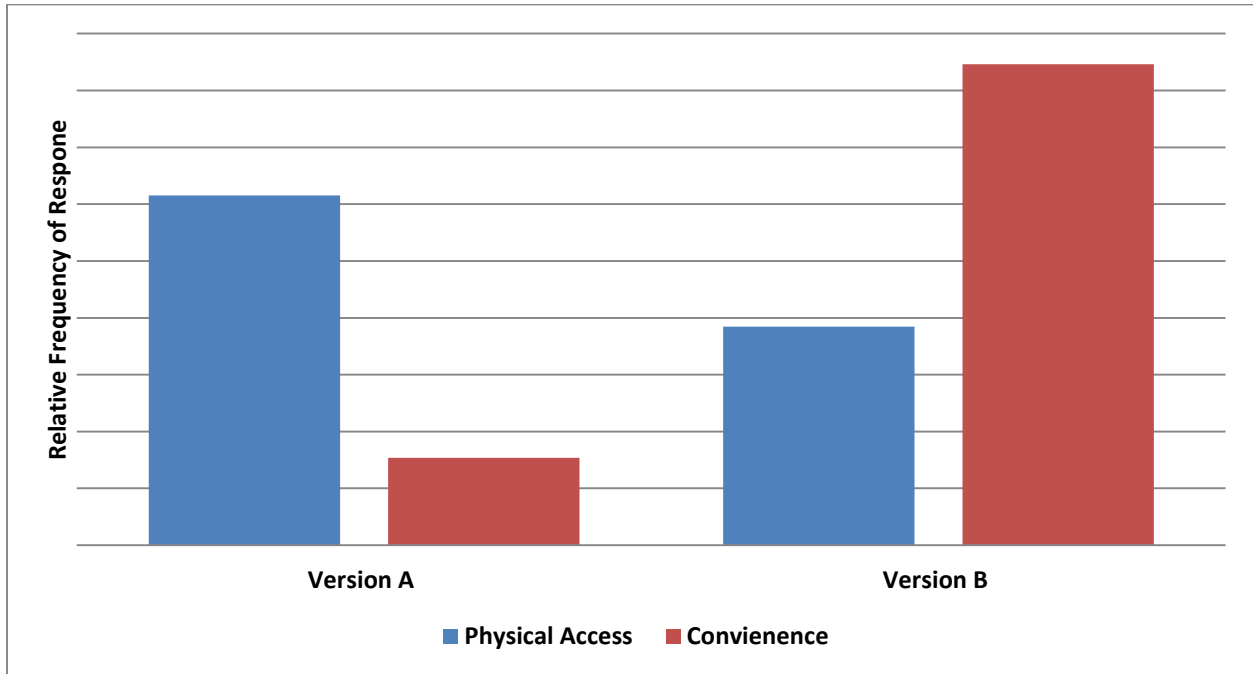
*Disability Analysis:* Only a slight difference emerged during the disability analysis: respondents who were classified as having a physical disability split their judgements relatively evenly between the consideration of physical accessibility and convenience. However, as seen below in Chart 3, respondents without a physical disability were much more likely to based their judgment on convenience than on physical accessibility.

**Chart 3a: Patterns of Judgment by Disability Status for Question BE3**



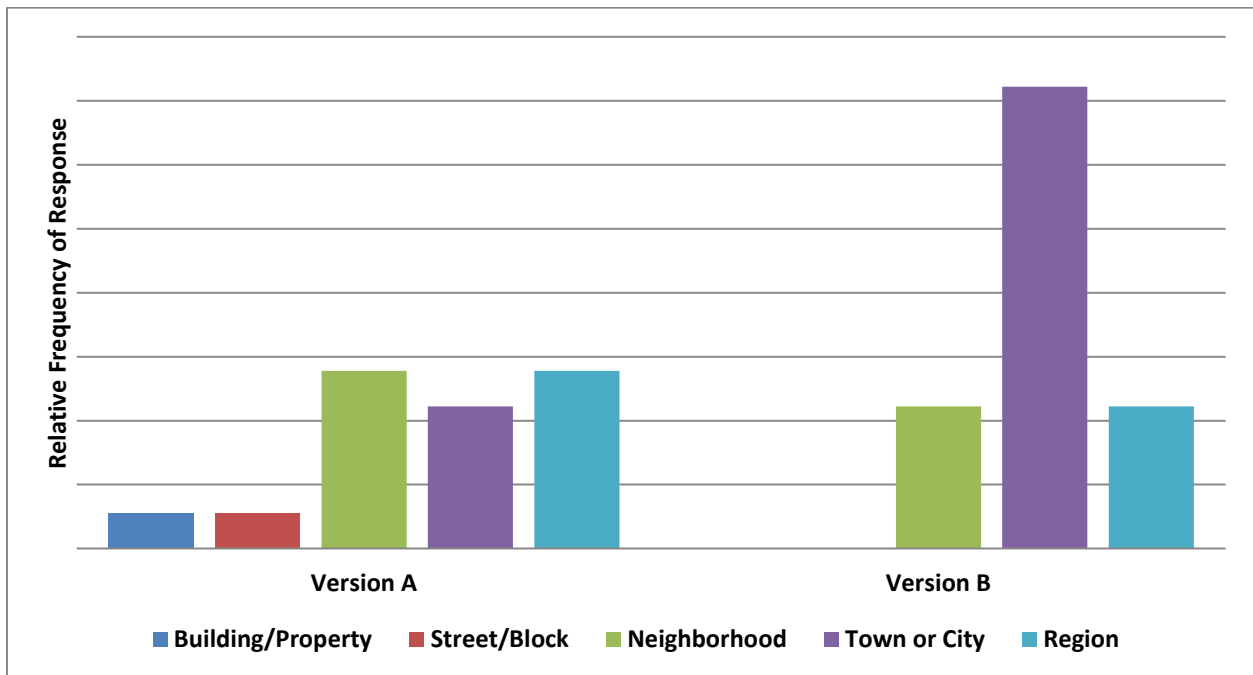
*Cross-Questionnaire Analysis:* Two major differences emerged across the questionnaire versions. First, as mentioned above in the disability analysis of Q BE3, there was a significant difference in how the respondents who received Version A of the questionnaire judged the needs stem over those respondents who received Version B.

Chart 4: Pattern of Judgment by Questionnaire Version for Question BE3



As can be seen above in Chart 4, the patterns of interpretation between the two versions were nearly opposite—with Version A respondents much more likely to consider whether or the physical access of a place met their needs and wants, while Version B respondents were similarly more likely to think about whether or not a place was convenient.

Chart 5: Questionnaire Version by Reference Area for Question BE3



In addition to how the respondents judged the needs stem, there was also a noticeable difference in the reference area the respondents used to frame both their interpretation of the core construct and the judgment of their “needs and wants.” Chart 5 above shows the relative frequency of the various reference areas the respondents used for each questionnaire version.

It is again clear that the un-framed Version A produces more cognitive variation than does the framed Version B. While most respondents who received Version A were thinking about either their neighborhood, the town they live in, or the metropolitan region, a few others considered things like the street they live on or their house or property. For instance, one Version A respondent was thinking about the hill she lives on:

...I live on the bottom of the hill on [a street in DC], so I usually have to walk up the hill. When my legs aren't feeling bad it's fine...I don't have to go too far.

Nearly all the Version B respondents, on the other hand, referenced their town when conceptualizing Q BE3.

**Question BE4: Using the scale on show card X, how easy or hard does the transportation you use make it for you to do the things you need or want to do?**

The respondents neither answered, nor understood, Question BE4 consistently. This inconsistency, at its core, stems from the complexity of the response process the respondents must navigate when answering this question. In the respondents' eyes, this question was asking about the more holistic act of *getting around*. Thus, most respondents did not simply consider whether or not their mode of transportation met their needs and wants, but rather thought about how easy or difficult it was to not only use their mode of transportation, but also to get to and from their car, bus, or subway. As was the case in the previous Broad Environment questions greater differences in interpretation between the respondents who received different questionnaire Versions than there were between physically disabled and non-physically disabled respondents.

*Core Construct Interpretations:* The respondents largely interpreted “transportation” in two ways: They considered their personal vehicles (cars and bikes) and/or public transportation, such as the buses or the subway. Additionally, nearly all the respondents considered more than one mode of transportation. For instance, one respondent said:

Very easy. Because if I'm not able to drive, I can call a friend. The city has this call-a-bus [service, through the county government]. Call a cab, when I purchase a book of [cab] tickets, I pay \$10 and get \$20 worth...I can get around.

Another respondent listed all the ways she gets around:

Bus, the train, the MetroAccess, and the little vans. [I take] the bus daily; train daily; MetroAccess two or three times a week. If I could afford it, I would use it more...They run 24/7.

In general, respondents appeared to consider this question to be asking: “how easy or hard is it for you to travel or get around?” In understanding the question this way, respondents by and large were not

thinking about how the individual pieces of the transportation system satiate their needs or wants. Rather, they “rated” how well the overall transportation system works; considering, for example, how long they have to wait for buses or trains.

*Reference Area:* As Q BE4 is specifically about transportation, many of respondents across both questionnaire versions were thinking about wide areas—usually their town or region. However, this varied some based on what form of transportation the respondents considered. Specifically, those who considered public transportation—buses and the metro—sometimes based their answer on the ease or difficulty of getting to that mode. In these cases, the respondents based their answer on a more local area—usually the streets or neighborhood they had to traverse to get to the bus or subway stop. This interpretation was not universal, however: Some other respondents who considered their use of the subway thought about the overall system and whether or not it met their needs and wants.

*Reference Person:* Unlike previous questions in the Broad Environment series, in Q BE4 respondents did not all interpret the phrase “you use” in the question text to simply be referring to themselves. While most respondents did consider “you” to mean the physical self, a few respondents interpreted it to mean “you” in a general, third-person sense not distinctly tied to the respondent’s own experiences. For instance, one respondent (who had no disabilities) considered (and answered based on) how people *with* disabilities might interact with the transportation infrastructure:

I give it a 2 as well... they have those lifts now for people in some of the busses and you lift a wheelchair up. And then they have the curb things in the street. A lot of the buses have the lifts for people...[but] I don’t see it in every mode of transportation. A lady in my neighborhood needed it. They didn’t have anything for people who were handicapped. Or people who couldn’t see. They need something to accommodate people.

Another respondent was thinking even more generally. While claiming that he drove everywhere, he answered the question with a response of “3,” based on his assessment of the public transportation system although he did not personally use it.

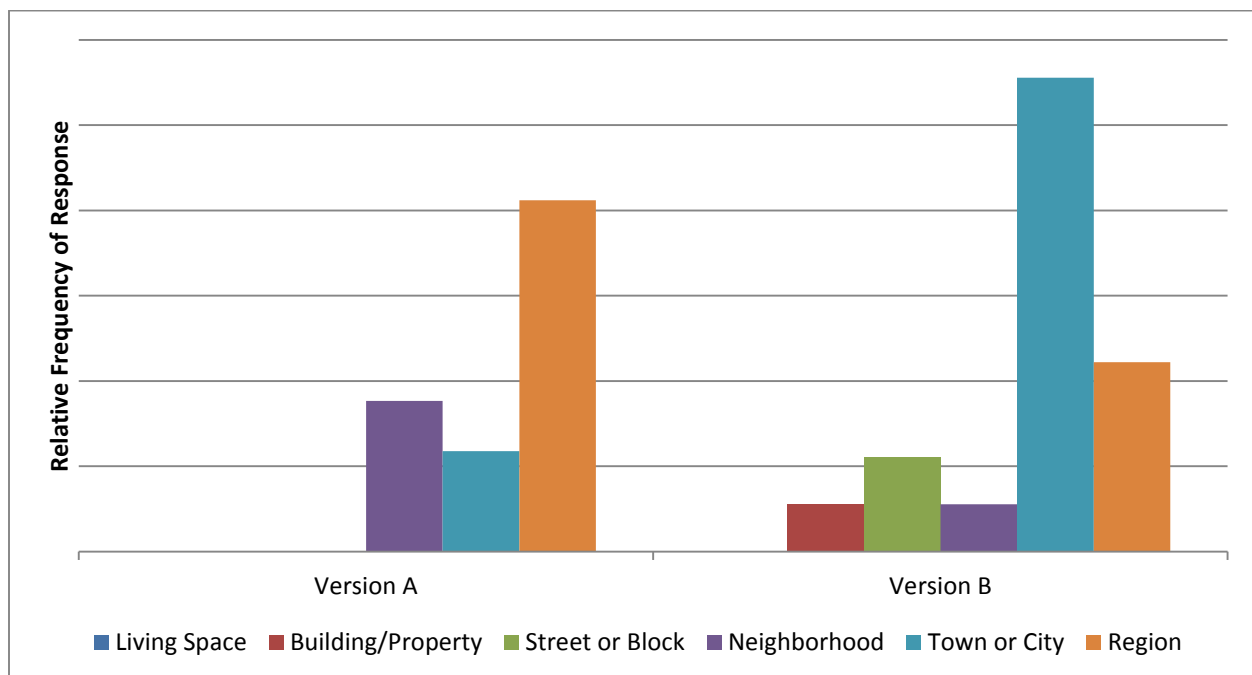
*Judgment of the Needs Stem:* While respondents continued to consider whether their physical accessibility or convenience needs and wants were met in a similar way as the previous Broad Environment questions, their judgment in Q BE4 was more complex as respondents tended to consider multiple “phases” of transportation. In particular, a number of respondents considered and judged both their trips to and from their primary mode of transportation (i.e. the walk to and from a bus stop) *and* the use of their primary mode of transportation (i.e. the bus ride itself).

As the respondents *independently* judged these various aspects of the use of transportation, their judgments occasionally conflicted. In these cases, respondents weighed these aspects and then *reported* on the one that was more salient to them at the time of the interview. For example, one woman who answered “4” explained that she was thinking about her bus rides to go shopping. She indicated that she had to walk up and down very steep hills to get to the bus stop, which was difficult in any sort of weather. However, she also noted that the bus ride itself was very easy, and that she was usually given one of the priority seats at the front of the bus. So while this respondent considered both “phases” of her transportation, in the end she reported on her judgment of the walk to and from the bus stop, not on the bus ride itself.

*Disability Analysis:* Very little difference emerged between how respondents who were physically disabled and those who were not answered Question BE4. One small difference that did emerge was within the Judgment of the needs stem step, where it appears that disabled respondents were slightly more likely to judge their needs and wants based on their trips to and from their primary mode of transportation (i.e. walking to and from a car) than did the respondents who were not physically disabled.

*Cross-Questionnaire Analysis:* The different ranges of reference areas, noted above in the analysis of Question BE3 does not hold up here in Question BE4. The unframed Version A produces a tighter set of reference areas than does the framed Version B, as seen below in Chart 6.

**Chart 6: Reference Area by Questionnaire Version for Question BE4**



While in this case Version B has a wider range than Version A in terms of interpretation of the reference area, the fact that the un-framed Version A is more likely to produce less “local” interpretations continues. Besides the reference area, no other significant differences between the questionnaire versions emerged.

**Question BE5: Using the scale on show card X, how easy or hard does your dwelling (including toilet and all rooms) make it for you to do the things you need or want to do?**

By and large, physically disabled and non-physically disabled respondents comprehended, judged, and responded to this question in the same ways. While some variation did emerge within how respondents judged whether or not their “dwelling” satiated their needs or wants, the spread of this variation was nearly the same across disabled and non-disabled respondents. On the other hand, the version of the questionnaire that the respondents received did matter: the ways those who received the unframed

Version A of the questionnaire judged and responded to Question BE5 were markedly different than those who received the framed Version B.

*Core Construct Interpretations:* Most respondents understood Q BE5 to be asking about the features of their homes, and only a small amount of variation emerged around how they thought about the core construct of “dwelling.” Typically, the respondents considered only their interior living spaces. In particular, respondents mentioned the bathrooms, kitchens, and bedrooms. However, some respondents also included their whole building (for those who did not live in a single-family home, such as an apartment building) or their surrounding property (such as their house’s lawn). It is important to note that all of the respondents limited their interpretations of “dwelling” to the interior and exterior spaces on their (or their landlord’s) property. Nobody for instance considered their neighbor’s lawn, the street in front of their home, or any sort of public space while answering this question.

*Reference Person:* As seen in the previous question, Q BE4, not all the respondents understood the word “you” in the question text to only be referring to them. Simply put, while most interpreted the “you” in the question text to mean themselves, a few respondents understood it to mean some other person—either hypothetical or real. For instance, one respondent thought about her niece who has a leg issue:

It’s pretty easy for me. I guess I have to go up the steps...or go down the steps to go to the bathroom in the basement. So my niece came over and her knee is bad so it’s difficult for her to go up the steps...I’d give it a 2. Because overall a friend of mine he has a bad leg and I see how he goes up the steps when he has to go to the bathroom.

An important finding to note is that this alternative interpretation of “you” was limited to respondents who received the un-framed Version A. All respondents who received Version B only thought about themselves while answering Question BE5.

*Judgment of the Needs Stem:* A great deal more variation emerged when the respondents judged how well their dwelling satisfied their needs and wants. Respondents considered one of four separate patterns of judgment:

1. Their ease of physical movement around the dwelling
2. The presence or absence of mobility or self-care accommodations
3. Their perception of the quality and their enjoyment of the dwelling
4. The available of services and features within the dwelling (such as porches or nice kitchens).

The first two of these patterns are relatively self-explanatory. In the first one, respondents thought about their ability to physically navigate around the dwelling, and how their dwelling’s layout either helped or hindered their movement. In the second pattern, respondents considered whether or not they had aids or modifications—such as shower seats or grab bars—in their dwelling that helped the move about and do their day-to-day activities.

The third and fourth of these patterns are similar to one another. A respondent judging the dwelling on its quality will consider the dwelling holistically, thinking about aspects that they like or don’t like. For example, one respondent who received Version A of the questionnaire explained her answer by saying:

I would say very easy... Well, we've got essentially a three-bedroom house. We have a living room, dining room, library, and almost a full finished basement... 3 and a half bath... We essentially have three full floors in the back.. I wouldn't say it's big, but it's very comfortable... It's more that it's laid out well than it's big.

Overall, respondents using the “perception of quality and their enjoyment of the dwelling” pattern of judgment are considering the question: “Do you like this dwelling?”

Respondents who employed the “available of services and features” pattern of judgment did not consider the dwelling holistically, but rather focused on one or a few specific services or activities that the dwelling either provided or did not provide. For instance, one respondent who received Version B was thinking about how she did not like bringing her friends into her home because of tensions within her family, and thus answered the survey question with a “2.” She explained:

Like all the things you need—sleep or eating—you can do at your house. But a lot of other things like social needs—like friends and stuff like that—you can't do at your house.... It's not a place where I would want to invite my friends over.

In a few cases, respondents appeared to consider two or more of these patterns. For example, one respondent considered both her ability to move throughout the dwelling and the accommodations she had installed:

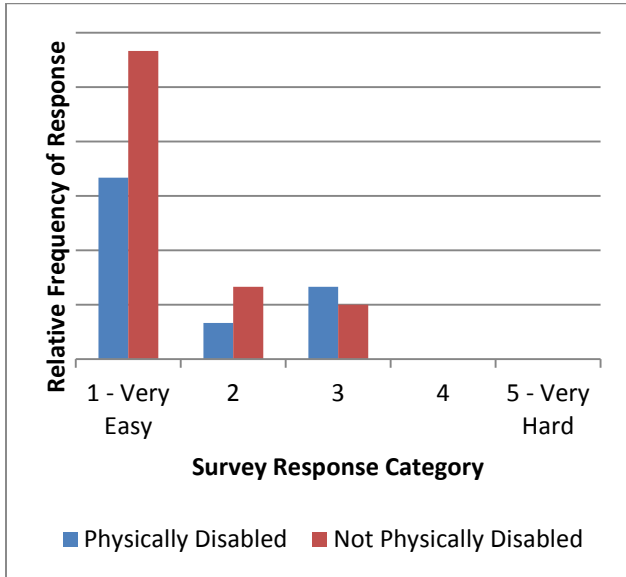
On that level I have a living room, three rooms, [and] a bathroom. I can't get a walker through the doorjamb to the bathroom... [And] the tub is a problem. If I get in it I can't get out. I do have raised toilets. On that level I'm good.

This combination—considering both physical movement and accommodations was common. In fact, nearly all the respondents who considered mobility or self-care accommodations also mentioned movement. However, the inverse is not the case: a number of respondents thought only about movement and did not think about accommodations for their health or physical abilities. For example, one respondent explained her answer by saying, “I was thinking of the restrooms and it's easy and I live on a rambler so it's all one floor.”

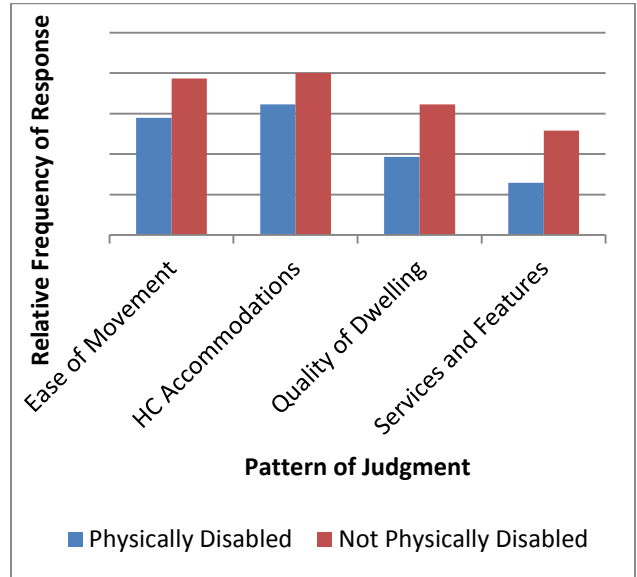
*Disability Analysis:* In general, respondents with disabilities did not approach or answer Q BE5 differently than respondents without disabilities.



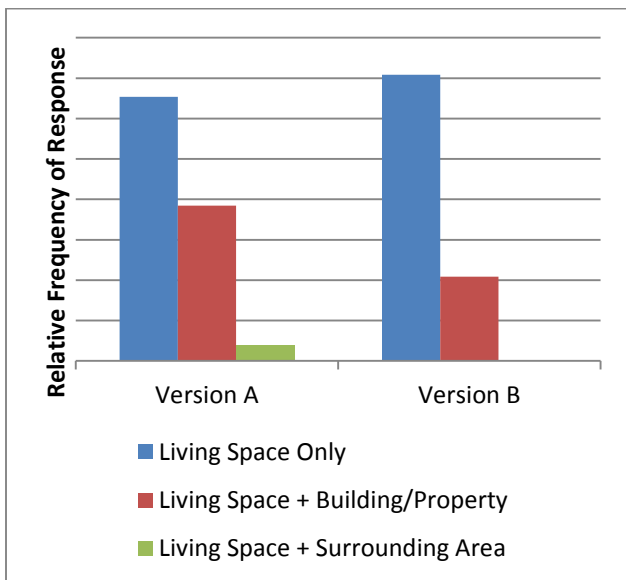
**Chart 7: Survey Response by Disability Status, Q BE5**



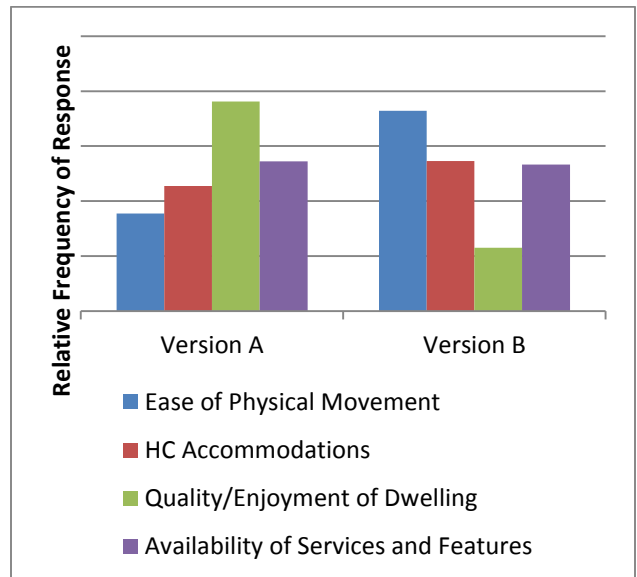
**Chart 8: Pattern of Judgment by Disability, Q BE5**



**Chart 9: Version by Reference Area, Q BE5**



**Chart 10: Version by Pattern of Judgment, Q BE5**



In terms of survey answers, no respondents across the entire sample answered either “4” or “5 – Very Hard” to this question. Furthermore, as seen above in Chart 7, both the physically disabled and non-physically disabled respondents responded to the question in very similar patterns. Similarly, no major difference emerged between how physically disabled and non-physically disabled respondents judged their dwellings, as can be seen above in Chart 8: both populations applied the four patterns of judgment in comparative proportions—with more respondents in both disability classes considering the presence or absence of handicap accommodations or their ability to move about the space.

*Cross-Questionnaire Analysis:* Mirroring the patterns seen in the previous Broad Environment questions, the unframed Version A again led to more interpretations based on a wider geographic area under consideration; while the respondents receiving the framed Version B tended to think more about themselves and a limited geographic area. As seen above in both Charts 9 and 10, Version B produced slightly less variation than did Version A. Furthermore, as seen in Chart 9, those respondents who received the framed Version B were more likely to think about their dwelling as only their living space (and not spaces further afield) than were those who received Version A.

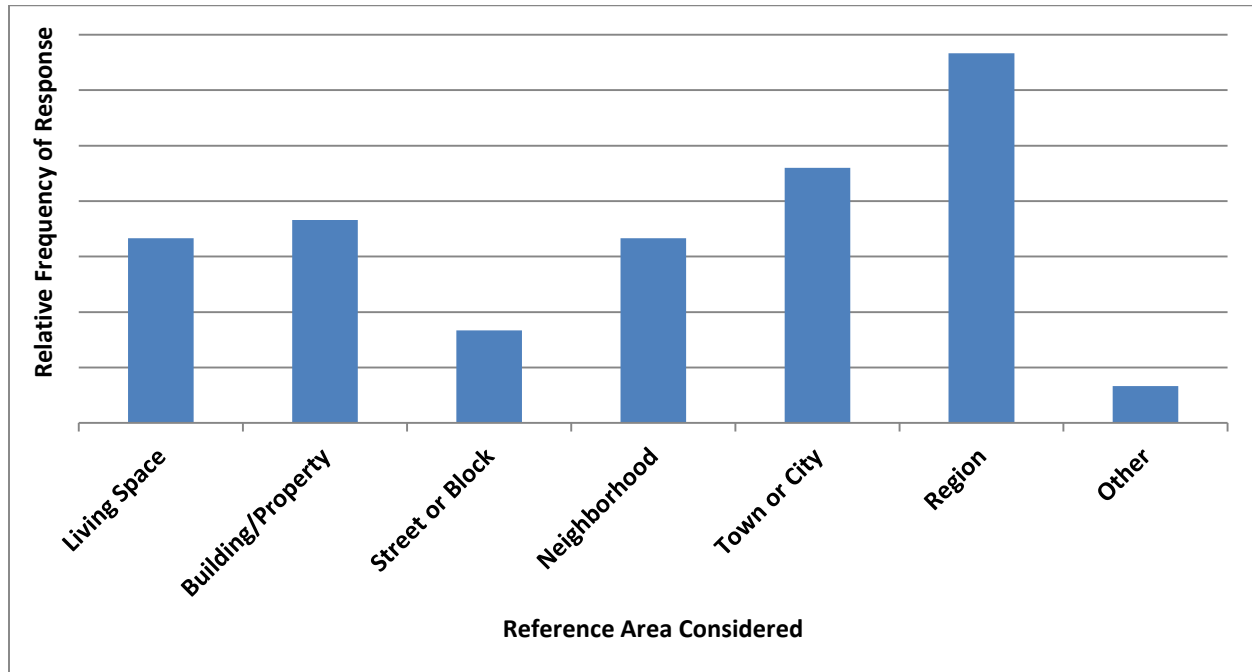
An additional difference between the two versions, mentioned previously, dealt with who the respondents actually answered Q BE5 *about*. When considering this “reference person,” all the respondents from Version B considered only themselves, while a number of respondents who received Version A also (or only) thought about other people.

**Question BE6: Using the scale on show card X, how easy or hard does your natural environment of the place you usually live—its temperature, terrain, and climate—make it for you to do the things you need or want to do?**

Due to its vague wording, complexity, and the resulting large variety of pathways respondents can use to answer it, Question BE6 does not produce consistent responses. The key to this confusion is the interaction between the core construct “natural environment” and the geographic indicator “place you usually live.” Both “place” and “environment” can be (and were) interpreted in multiple ways, and respondents’ interpretation of the latter is dependent on their conceptualization of the former. Thus respondents with similar physical abilities, living in similar situations in the same town answered this question in different ways and arrived at different answers.

*Reference Area:* Respondents considered a wide range of reference areas while responding to Q BE6. They ranged from the very close-to-self such as living areas and buildings and property, to areas much further afield such as towns and cities and the metropolitan region as a whole:

Chart 11: Relative Frequency of Reference Areas for Question BE6



As seen above in Chart 11, no one interpretation was dominant across the cognitive interviewing sample. This variation is certainly due to the weak framing provided the vague instruction "...the place you usually live." Given that respondents base their interpretation of survey questions on their individual lived experiences, a term as un-focused as "place you usually live," will not only produce a large variety of responses *between* respondents, but could also vary for an *individual* respondent based on the salient items and actions in their life at the time of the survey interview.

*Core Construct Interpretations:* The respondents also interpreted the core construct in Q BE6, "natural environment," in a wide variety of ways. On the face, the term "natural environment" would seem to evoke *nature*. However, most respondents did not think about only their natural environment (or, as the question text suggests, "temperature, terrain, and climate."), and a large group of respondents did not think about their natural environment *at all*. Four general patterns of interpretation emerged around the core construct: the built environment of the reference area, climate and temperature of the reference area, the people in the reference area, and the terrain of the reference area. Of these four, the first two patterns of interpretation were by far the most common.

It is important to note, however, that while a respondent might have been thinking about his or her climate and temperature, they were doing so about the reference area determined in the previous stage of response. Thus, if a respondent was thinking about their town or region as the reference area, they tended to think about climate as a natural phenomenon. For example, one respondent thought about the variable climate of the Washington Area:

At least a 2. We do have occasional snow. Have extreme temps...Hills. When I go on my bike ride if I have to go down the hill and then up the hill.. I'll sometimes put my bike on the bus to get up that hill.

However, if a respondent was thinking about his or her living space or building and property (or some other interior reference area), they would think about climate and temperature as an artificial

phenomenon—i.e. air conditioning and heating. For instance, one person noted that his building had poor air conditioning during the summer months:

Well the sometimes the AC doesn't work as well as it should. So if it's a hot day it'll be kinda hot. Hotter than I'd like it. So I'd say hmmm 2 if it's too hot for me to sleep. Every summer. AC's just not that great. Like right now 70 80 cools down pretty good. Once it gets to 85-90 can't compete with the heat. Have to get on them about that...

Both of these respondents reported an answer of “2” to the survey question, but clearly interpreted the construct in very different ways. This complex interaction between the respondents’ interpretations of the reference area and the core constructs is the major contributor to the high levels of variation seen across the responses to Q BE6.

*Judgment of Needs Stem:* Once the respondents decided which of the four ways they would interpret their “natural environment,” they had to judge whether or not this natural environment satiated their needs and wants. As seen throughout the other Broad Environment questions, multiple patterns of judgment emerged; in Question BE 6 five patterns of judgment emerged. They include whether or not the natural environment had various *services or features* that satiated the respondents needs, whether or not the natural environment was *convenient* for activities or daily life, how the natural environment contributed to the respondent’s *ease of movement*, what *health effects* the natural environment had on the respondent, and the judgment of the *overall quality* of the natural environment. The response schema incorporating these various patterns of judgment is illustrated below in Figure 4.

None of these five patterns was dominate across the cognitive interview sample, although “health effects” was employed only by a few respondents. Some respondents considered only one of these patterns of judgment, while others considered two or more. The former was much more common in Version B, while only one respondent in Version A applied only one pattern of judgment to their reasoning.

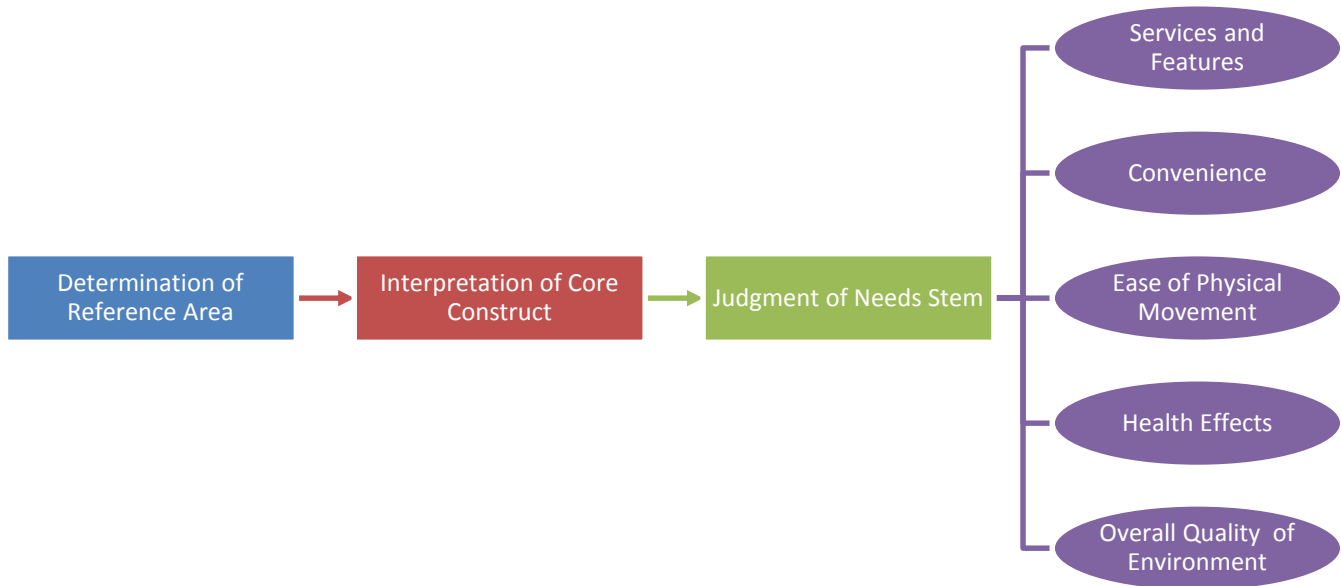


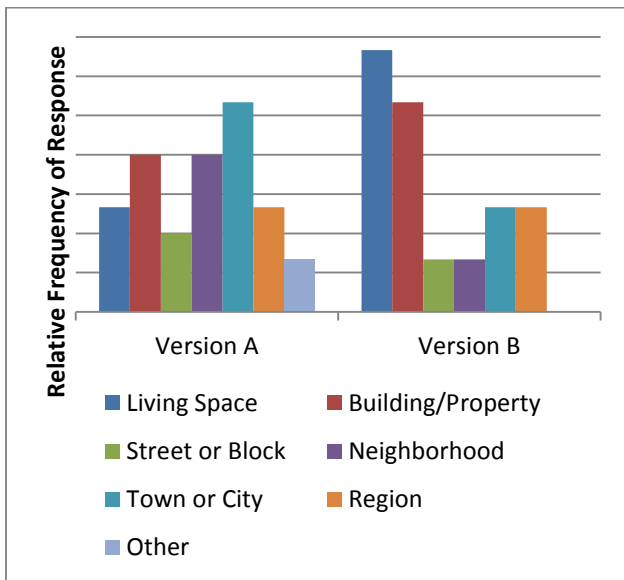
Figure 4: Cognitive Schema of the Judgment of Question BE6

It is important to stress again that these judgments are based on the respondents’ interpretations of the “natural environment” core construct, which itself was framed by the reference area. At a minimum, given the seven different reference areas, the four interpretations of the construct, and the five patterns of judgment that emerged from the cognitive interviews, there are *at least 140 different response pathways* a respondent could use to arrive at his or her final answer to Question BE6. Such a wide variety of possible responses not only leads to a very low level of construct validity, but also to a high potential for response error.

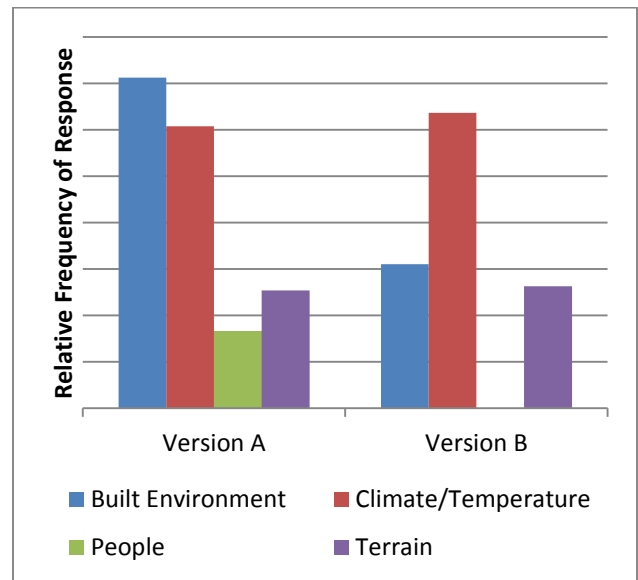
**Disability Analysis:** Few differences emerged during analysis between respondents in the different disability categories. At the most basic level, respondents who were not physically disabled tended to answer the question using the “1 – Not Hard” answer category, while physically disabled respondents’ answers varied a slight bit more. However, by and large respondents who were physically disabled did not determine the reference area, interpret the core construct, or judge their needs and wants in a different pattern than did the respondents who were not physically disabled.

**Cross-Questionnaire Analysis:** The same cross-questionnaire version differences that emerged in the previous Broad Environment questions are present here in Q BE6 as well. First, the respondents had a broader set of reference areas, and were more likely to consider a further afield reference area if they received the un-framed Version A, while they were more likely to think of a geography close to the home if they received Version B. This trend can be seen below in Chart 12:

**Chart 12: Questionnaire Version by Reference Area, Q BE6**



**Chart 13: Questionnaire Version by “Natural Environment,” Q BE6**



Secondly, the respondents who received the framed Version B continued to show less variation in the interpretation of the core construct. In this case, as can be seen above in Chart 13, the Version A respondents had no one dominant interpretation, while the Version B respondents tended to be thinking about climate and temperature. Additionally, in the judgment phase, the Version B respondents—who had already received questions about Health Conditions and Capacity—were much more likely to judge their environment on its ease of physical movement than the Version A respondents who had no health framing.

**Question BE7: Using the scale on show card X, how easy or hard does the lighting, noise, and crowds in your surroundings make it for you to do the things you need or want to do?**

Question BE7 was interpreted in a much more consistent manner than any of the previous Broad Environment questions. Respondents only considered the three aspects of the core construct ambiance given as examples in the question text—lighting, noise, and crowds. Furthermore, they universally judged these three aspects of ambiance in the same way: lighting as a positive characteristic; noise and crowds as “negative” characteristics. However, the interpretations of the reference area varied widely, and those respondents who received the unframed Version A of the questionnaire again had a wider set of reference areas than did those who received the Version B. Additionally, the plural term “surroundings” made the respondents’ task of determining the reference area even more complex, with some respondents considering (and attempting to respond about) multiple geographic areas.

*Reference Area:* Like what was seen in Question BE6, Question BE7 explicitly mentions the reference area in the question text. While in the previous question the term “place” was used, this question asks about “surroundings.” The respondents’ attempts at un-packaging this term is the largest source of variation in the overall interpretation of Q BE7. The respondents considered a similar range of locations for the reference area as they did in previous questions—from their living space itself to the building and property, to their city and the Washington region. However, the framing by the plural term *surroundings* adds additional complexity.

While in previous questions most respondents considered a single reference area, in Q BE7 a significant number thought about multiple reference areas and locations. It appears that the word *surroundings* itself has a dynamic meaning to some respondents.

Most respondents considered surroundings to be a static or singular location—much like what was seen in Q BE6 for the term “place.” For example, one respondent who considered only a single location explained his answer like this:

Environment has nothing to do with noises. It’s because someone in some other apartment is making too much noise. The lighting is neutral you can see in the halls fine.

Others understood the reference area in a more dynamic sense and thought about (and went on to judge) multiple locations. Some of these respondents noted difficulty in providing a response. For instance, one such respondent said:

Let’s see I don’t know you caught me off guard there...I don’t know...In my environment? In my home? My mind went to [the local community college] because I go down there five days a week...We have an active senior program in the gym where it’s anywhere between sixty to seventy people.

Clearly, if a respondent thought about a single reference area, then they would only judge that single location’s ambiance later in the response process. On the other hand, if a respondent considered multiple locations, then he or she would go on to judge each of these location’s ambiance and then combine those judgments in some way to arrive at a survey response.

*Core Construct Interpretations:* There was very little variation across the sample in the interpretation of the core construct in Q BE7. This construct—ambiance—is explicitly framed in the question text with the phrase “lighting, noise and crowds.” The respondents largely limited their interpretations of ambiance to these three terms, and most considered either two or all three during the judgment phase.

*Judgment of the Needs Stem:* As noted above, most respondents appeared to think about either two or three of the examples—lighting, noise, or crowds—provided in the question text. For example [emphasis added]:

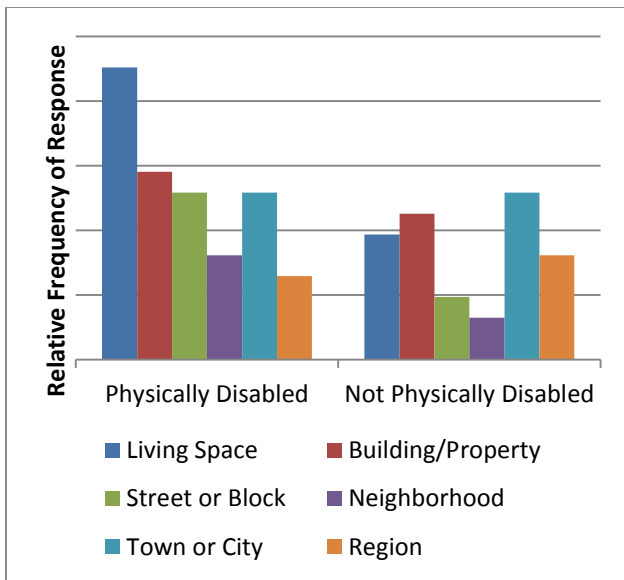
I live in a **quiet** neighborhood there are only 10 homes on my street. We’re fortunate in my home. Now again do they mean am I in my home? If I go down to the grocery store, then this is actually really hard to answer...If I have to go down to the main roads...I have to go really early in the morning...in the shopping center there’re fools...the **drivers, the crowds:** I just don’t like that

Each of the three aspects of ambiance given in the question text were interpreted across the board as either a positive or a negative aspect. Lighting was generally perceived to be a good thing; respondents frequently used the “adequate lighting,” and explained that the more light the better in their minds. Noise, on the other hand, was generally assumed to be negative, and typically associated with loud neighbors or noisy locations. Finally, crowds were also generally perceived to be negative: Respondents largely noted how crowds interfered with their needs or desires to perform various actions (like parking or shopping quickly).

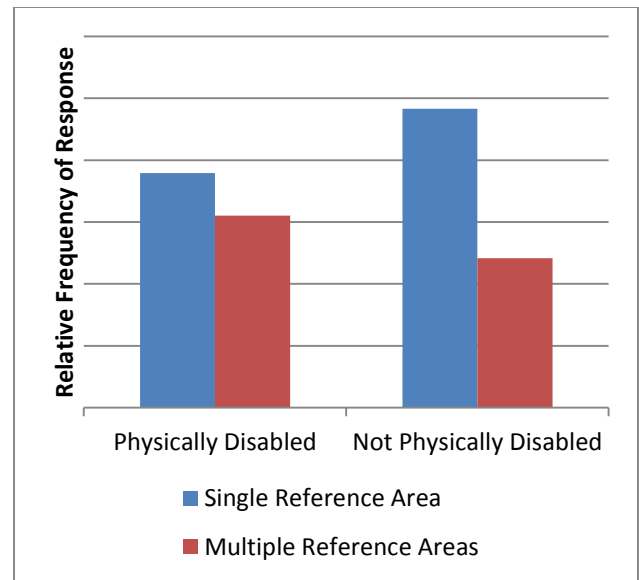
While the respondents tended to both think about the various aspects of ambiance similarly, and to consider multiple aspects when judging their surroundings; they typically only *answered* the question based on one of the aspects. Take the example above, for instance. While the respondent considered both noise (“I live in a quiet neighborhood...”) and crowds (“the drivers, the crowds: I just don’t like that), she based her survey response only on the noise aspect and responded with a “1 – Very Easy.”

*Disability Analysis:* A few differences in interpretation of Q BE7 by respondents with physical disabilities versus respondents without physical disabilities emerged. As seen below in Chart 14, respondents with physical disabilities were more likely to focus on their living space, property, or the areas nearby (such as the street than were the respondents without physical disabilities.

**Chart 14: Disability Status by Reference Area, Q BE7**



**Chart 15: Disability Status by Response Pattern, Q BE7**



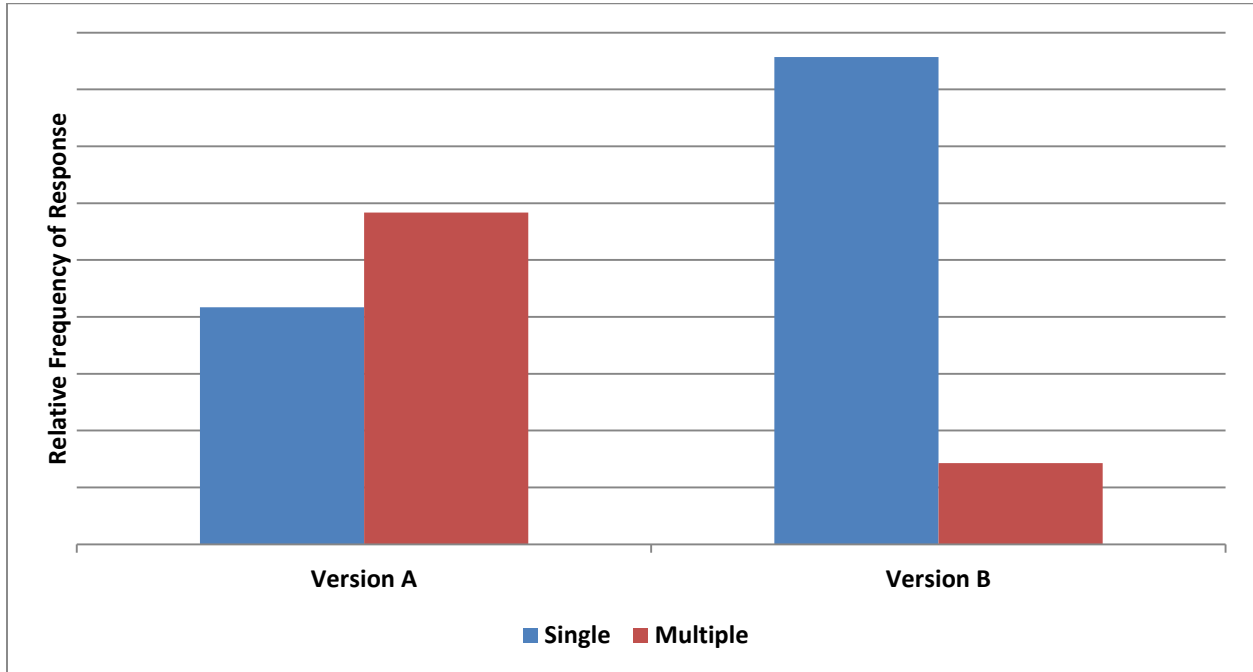
Furthermore, as seen in Chart 15, respondents without physical disabilities were more likely to consider only a single reference area, while respondents with physical disabilities split between thinking about single or multiple locations.

However, beyond these differences in the determination of the reference area, there was not much differentiation between how respondents with physical disabilities and those without interpreted the core construct of ambiance, or judged how it did or did not satiate their needs and wants.

*Cross-Questionnaire Analysis:* Only one major difference between the questionnaire versions emerged: Respondents who received the framed Version B were much more likely to consider only a single reference area, whereas the respondents who answered the un-framed questionnaire Version A were split between considering a single or considering multiple reference areas:



Chart 16: Questionnaire Version by Response Pattern for Question BE7



This distribution pattern in Chart 16 is very similar to the one seen above in Chart 15—where respondents with physical disabilities were split in their interpretations and respondents without physical disabilities favored a single location. The questionnaire version sub-samples had almost the same number of respondents classified as physically disabled (15 received Version A, while 19 answered Version B, see Appendix A). While further research is necessary, these findings may indicate that the differences seen in Chart 15 and 16 are due to an interaction between cognitive framing and health or disability status.

Given the fact that some of the Assistive Aid/Device Utilization (AA) questions were used in identifying whether or not an individual coded as disabled (see Appendix A), the following questions do not include a disability analysis.

The response categories for all of the Assistive Aid/Device Utilization questions were:

1. Yes
2. No
- Don't Know
- Refused

**Question AA1: Do you have someone to assist you with your day-to-day activities at home or outside, including family and friends?**

Respondents expressed a substantial amount of confusion when answering Question AA1, particularly what exactly they should count as assistance. This difficulty led to a large amount of variation both in the interpretation of the core construct of “assistance with day-to-day activities,” as well as in the resulting judgment of whether or not they had someone who gave them that assistance.

*Core Construct Interpretations:* The construct for “assistance with day-to-day activities” held a wide array of interpretations across the cognitive interviewing sample, and its interpretation caused noticeable confusion among the respondents. One respondent summed up her confusion, saying: “I mean everyone needs assistance sometimes.” While in the end they understood the question to be asking about routine tasks such as bathing, laundry, cooking, cleaning, and yard work, most respondents first considered a wider range of less ordinary tasks before deciding that the question was just about routine ones.. However, some respondents continued to consider out-of-the-ordinary tasks for their responses. For example, one respondent said:

Well recently I had to buy a dehumidifier. So the store loaded it and a friend at home helped me get it out of the car.

While the respondent recognized that purchasing a dehumidifier was not an ordinary, day-to-day task, she still included it as part of her interpretation. Another respondent noted a time when he needed assistance cutting down a tree. These respondents appeared to comprehend the question as “do you ever need anyone to help you?” focusing on perhaps the most salient instances when they needed assistance, instead of help with their everyday activities.

In most cases, the respondents’ references to household tasks and yard work indicate that the instruction “at home or outside” was understood to limit the response one’s home and/or property. In some cases, however, the reference area included a larger area beyond the respondents’ immediate property, including locations such as the grocery store.

*Judgment of Use:* Beyond the core construct of “assistance,” there was also variation around the phrase “Do you have someone...” While most respondents understood “someone” to be a family member, friend, or paid assistant (such as a nurse or paid laborer), two distinct interpretations of the

actually assistance they provided emerged. On one hand, some respondents simply considered the construct to refer to the *existence* of someone. For instance, one respondent claimed, “I have friends to do things with.” Other respondents considered whether or not someone *performed* or assisted with a task. Respondents employing this latter pattern of judgment identified things such as a living assistant that helped the respondent get dressed or laborers contracted to cut the respondent’s lawn. Many respondents struggled with making this choice between the two interpretations. For instance, one respondent attempted to clarify if the question was asking: “Is there someone who exists who could help me or do I call upon someone to help me?”

After respondents selected the pattern of judgment they wished to employ, respondents then determined whether or not this someone existed or assisted them with a task. If the respondent concluded that this someone did not exist or that he or she was not solicited for assistance, they responded “no” to Q AA1. On the other hand, if a respondent believed the contrary to be true, they then made a judgment about whether or not the assistance they received qualified for an affirmative response. The schema illustrated below summarizes this process:

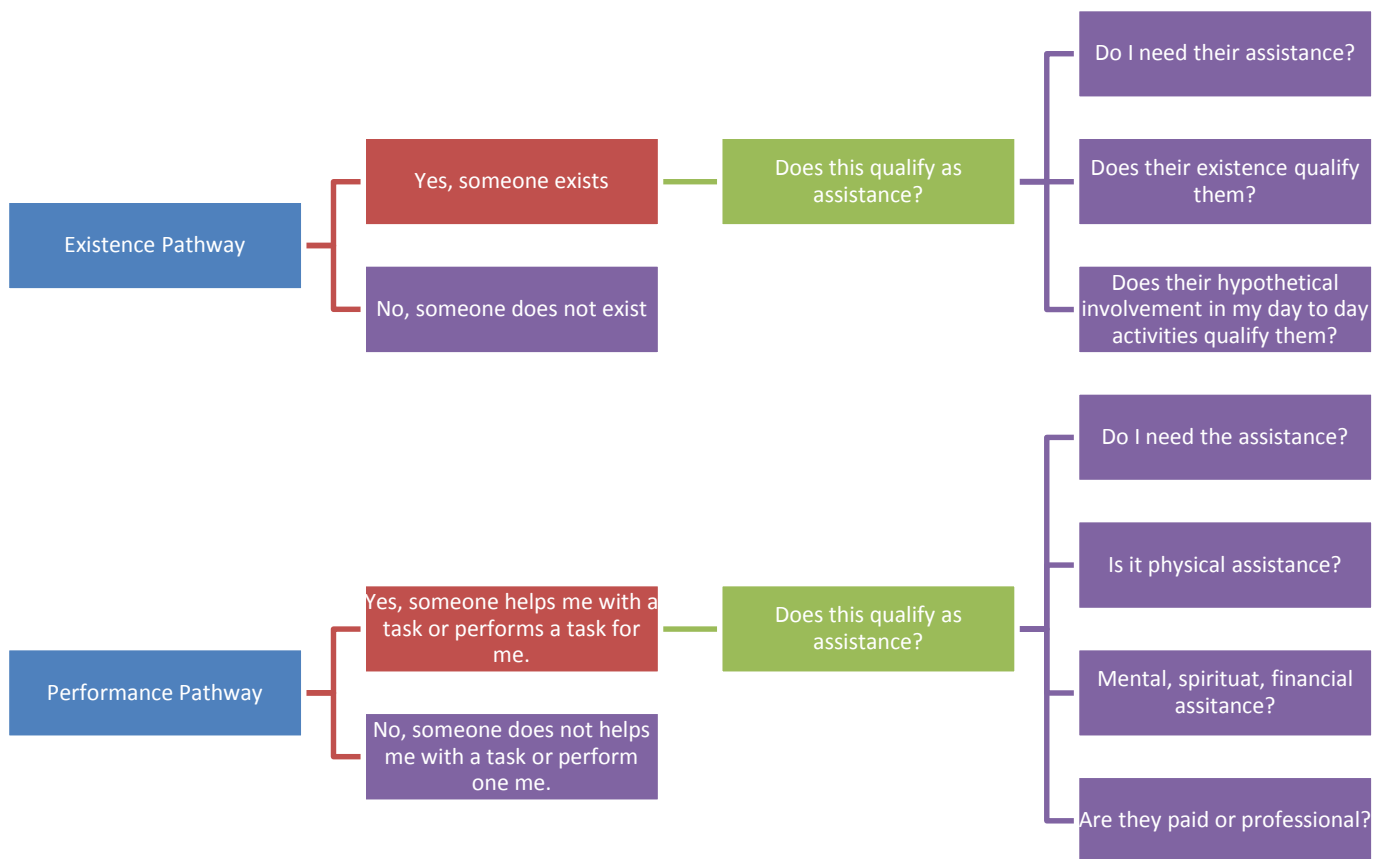


Figure 5: Response Process for Question AA1

Based on the pattern of judgment selected, respondents considered one of the above questions (in purple) when making their final judgment and response to the survey question. For instance, under the existence pathway, a respondent noted that, “[My] two daughters live nearby and they would be available to help me if I need and called upon,” but still responded with a “no” to question. Although he

acknowledged that he had family members that could assist him if called upon, he believed that this was not enough for him to respond “yes” to Question AA1 because he didn’t need their help. On the other hand, another respondent who answered “yes” thought that just having a group of friends nearby that she could ask for help qualified. This respondent did not note that she has asked these friends for assistance, but was simply considering whether or that that assistance could *exist*.

Another respondent answered no, but used the performance pathway. In explaining his answer, he said:

No I have friends. There are a couple of girlfriends come by now and then. As far as being there to assist me, [they] sometimes might cook something. [But] I don’t think it qualifies... Assistant would be some... like a home or health aide.

While this respondent identified individuals in his life that assists him with daily tasks such as cooking, he believed this did not qualify him to respond “yes” to the question because he did not need the assistance. Furthermore, he felt that since this person was not paid or a professional it further disqualified him from responding “yes.”

*Cross-Questionnaire Analysis:* Two major cross-questionnaire differences about how respondents answered Question AA1 emerged. Respondents tended to generate different interpretations for the reference area of their “day-to-day activities” based on which questionnaire version they received. Following the trend noted above throughout the Broad Environment questions, Version B respondents were more likely to consider constructs that were closer (in terms of proximity) to their physical self than were Version A respondents. Specifically, those respondents who answered the framed Version B tended to interpret “outside” to be closer to one’s home than Version A respondents did, including activities such as yard work. On the other hand, Version A respondents frequently referenced grocery shopping, running errands, and out-of-the-ordinary tasks.

Another cross-questionnaire difference emerged during the judgment phase of response. While respondents in both questionnaire versions selected the “Existence” and the “Performance” Pathways (see Figure 5 above) with similar frequency, there were noticeable differences in how they actually applied the various patterns of judgment (the purple boxes in Figure 5) in order to arrive at a “yes” or “no” answer.

For example, respondents in Version A were more likely to simply consider the *existence of someone* as enough of a qualification to respond affirmatively to Question AA1. One Version A respondent, who replied with a “yes,” said, “I have friends I can call on, but sometimes they aren’t available.” Thus, this respondent reports that 1) her friends exist, 2) they could help if she needed it, but 3) they are not always present, and judges that she should answer “yes” to the question. On the other hand, most Version B respondents considered the simple fact that help existed to not be enough of a qualifier. For instance, a female Version B respondent responded “no” to Question AA1, and explained that she has close friends that help her “in the sense of my mental health,” but do not provide her with the level of support she thinks should count for this question. This respondent therefore reported that 1) her friends exist, 2) they provide some social support, but 3) they do not help her physically accomplish tasks, and then judges that she should answer “no” to Question AA1. The fact that respondents who received the different questionnaires would take a similar set of facts and arrive at different answers indicates that the cognitive framing provided by Version B does indeed affect how respondents approach the survey questions.

**Question AA2: Do you take medicines on a regular basis?**

Question AA2 was not systematically probed during the cognitive interviews; no findings are available.

**Question AA3: Looking at show card X, do you *use* any of these mobility or self-care aids?**

**Question AA4 Looking at show card X, do you *need* any of these?**

The show card displayed the following items:

|    |                             |
|----|-----------------------------|
| 1  | Orthopedic footwear         |
| 2  | Artificial limb (leg/foot)  |
| 3  | A cane or walking stick     |
| 4  | Crutches                    |
| 5  | A wheelchair                |
| 6  | A walker or a scooter       |
| 7  | Braces                      |
| 8  | An adapted motor vehicle    |
| 9  | Extenders or grasping tools |
| 10 | Another aid                 |

Because Question AA4 was designed as a follow-up to Question AA3, these questions were analyzed, and are presented, together. Their interpretations of the core constructs across the two questions are identical—respondents simply carried their conceptualizations forward from Q AA3 to Q AA4.

Overall, Questions AA3 appeared to capture whether or not respondents *had* any of the devices on the show card, and respondents had relatively tight interpretations of the devices—with a few exceptions discussed below. However, respondents did not consistently judge whether or not they *needed* these devices in Question AA4—with some respondents thinking that only constant reliance on the device qualified as a “need,” while others used a much looser standard and qualified even occasional reliance as a “need.”

*Core Construct Interpretations:* While the respondents’ interpretations of some of these items were similar, other items caused some confusion. Respondents easily and consistently identified the following items: artificial limbs, cane or walking stick, crutches, wheelchair, and walker or scooter. Their interpretations of these five items did not vary, probably because these are either very common items (such as a cane or crutches) or self-explanatory (such as an artificial limb). However, their interpretations differed for orthopedic footwear, braces, adapted motor vehicles, extenders and grasping tools, and other aids. The figure below summarizes the interpretations of the items that showed extensive variation:

| "Orthopedic Footwear"  | "Braces"   | "Adapted motor vehicle"  | "Extenders or grasping tools"  | Other Aids   |
|--|--|--|--|--|
| <ul style="list-style-type: none"> <li>•Footwear such as sneakers</li> <li>•Shoe inserts prescribed by a physician</li> <li>•Shoe inserts bought over-the-counter</li> </ul> | <ul style="list-style-type: none"> <li>•Elastic Joint Brace</li> <li>•Dental Braces</li> <li>•Structure providing back brace</li> <li>•Plastic leg braces</li> </ul> | <ul style="list-style-type: none"> <li>•(Motorized) Wheelchair</li> <li>•Scooter</li> <li>•Car with chair lift</li> <li>•Car with pedal extenders</li> <li>•Car with modified steering wheel</li> <li>•Car modified for "someone without limbs"</li> </ul> | <ul style="list-style-type: none"> <li>•Device used to pick up items</li> <li>•Device used to reach high up</li> <li>•Clippers (for landscaping)</li> <li>•Specialized tool for "someone without limbs"</li> </ul> | <ul style="list-style-type: none"> <li>•Button around neck for emergencies</li> <li>•Bed with grab rails</li> <li>•Velcro Straps</li> <li>•Health-related cushions and neck rolls</li> <li>•Grab handles in bath rooms</li> <li>•Hearing aids</li> </ul> |

Figure 6: Interpretation of Selected Items on the Questions AA3 and AA4 Show Card

Some respondents simply identified “orthopedic footwear” to be a reference to normal shoes. For instance, a female respondent noted that she used orthopedic footwear, citing her usage of “Easy Spirits” and “Ugg boots.” The term “braces” captured the construct of added support. But the bodily location and the sturdiness of the material varied. One Version A respondent explained that he was thinking about “...dental braces, from the orthodontist.” Respondents that used “other aids” listed their aids as prompted. All of these aids were mobility or health related. One respondent, who suffered a stroke that left one side of his body incapable of performing certain tasks, stated how he used a fair amount of Velcro and installed grab rails in various places of his house to assist with his disability.

The term “Adapted Motor Vehicles” was not consistently understood at all, and a number of respondents indicated that they were confused by the term. Upon probing, most respondents believed it simply referred to a wheelchair or scooter, even though another item on the show card clearly included these devices. A few respondents did comment on this overlap, which seemed to increase their confusion. For example, when asked what he was considering when he said “no” to having (and needing) an adaptive motor vehicle, one respondent said, “It sounds like a wheelchair to me, but you have wheelchair here as number 5. I don’t know.”

Extenders and grasping tools were often mentioned in the context of their assistive abilities. Many respondents characterized them by their ability to assist with tasks, or to make them more convenient. Importantly, they were not always interpreted as a tool related to health or disability. For instance one respondent explained that she did have a grasping tool, but that she didn’t need it because of any sort of chronic issue or disability:

Let me see: I have one of those to reach things up high, like on shelves, instead of getting the stool. It’s not because I’m handicapped, it just makes it easier.

Some other respondents explained that these devices were a necessity due to their health. One female respondent, for example, noted that she, “absolutely had to have them [extenders and grasping tools],” thinking about how unsteady she was on her feet and how she had difficulty balancing and reaching at the same time.

*Judgment of Use:* The pairing of Questions AA3 and AA4 aimed to capture both the respondents' usage of and need for assistive devices. When judging their use and need for these devices, the respondents employed a variety of patterns. These include:

1. Respondents expressed that they used and needed their assistive device(s).
2. Respondents expressed that they used, but did not need, their assistive device(s).
3. Respondents articulated that they possessed but did not use their assistive device(s).
4. Respondents articulated they did not have or use, but needed certain assistive devices.
5. Respondents articulated that they did not use or have, but desired certain assistive devices.

Respondents commonly articulated that they used, but did not need, their assistive device. A fair number of respondents also expressed that they had, but did not use their assistive devices. One such respondent, who answered "yes" in Q AA3 but "no" to needing a cane in Q AA4 explained:

They issued me one. But I don't use it... Sometimes I think it's faster if I'm late if I don't use it... I can walk without it but it is there as an aid.

Other respondents claimed that they only needed to use their aids under certain circumstances, such as the using a walking stick in a rocky area. These respondents did not apply this pattern of judgment uniformly however. While a majority of respondents who indicated that they sometimes came upon situations where they needed their device answered "yes" to the corresponding item in Question AA4, a large number instead answered "no." This latter group believed that in order for them to say "yes" to the need question, they would have to require the device's assistant all or a majority of the time.

Additionally, a few respondents answered Question AA4 not with need in mind, *per se*, but instead by considering their desire. These respondents indicated that having the device would be helpful, but it was not necessary. For instance, one respondent said that she wanted, "... an adapted motor vehicle if some wants to donate one to me."

*Cross-Questionnaire Analysis:* There were only slight differences between the respondents' interpretations of Questions AA3 and AA4 across the two questionnaire versions. For example, Version A respondents and Version B respondents identified different constructs for "braces". Respondents in Version A understood "braces" to be elastic braces for joints, dental braces, and a structured brace for ones back. On the other hand, Version B respondents had a tighter interpretation of "braces," and uniformly understood the term to be referring to leg braces. These small differences in interpretation could simply be due to the sample; however, and further, targeted research would be necessary to draw meaningful cross-questionnaire conclusions.

**Question AA5:** Looking at show card X, are there any of these things that make it easier for you to participate in activities outside your home?

**Question AA6** Looking at show card X, do you *need* any of these?

The show card displayed the following items:

1. Accessible public buildings open to the public, e.g. shops, cinemas or worship places
2. Accessible public buildings, e.g. city hall or post office
3. Accessible signage and way finding
4. Accessible public toilets
5. Accessible public transportation
6. Accessible roads, paths, and trails.
7. Do not use anything

Similar to Questions AA3 and AA4, Question AA5 and its follow-up Question AA6 are presented together. As seen with the previous set of questions, respondents carried their interpretations of the core constructs forward from Q AA5 to Q AA6.

*Core Construct Interpretations:* A number of the items on Questions AA5 and AA6’s show card confused the respondents, leading to a wide variety of interpretations. Many respondents were unable to draw distinctions between the first two items—accessible public buildings open to the public, and accessible public buildings. Most respondent dealt with this by simply considering them to be the same category. For example, one respondent believed the items were the same, but with rearranged words, noting: “These really seem similar. One says accessible public buildings open to the public and one says accessible public buildings.” Likewise, another respondent explained that she, “. . .kind of want[s] them in the same category.” The phrase “open to the public” did not appear to correlate in the respondents minds to the examples in Item 1 (“shops, cinemas or worship places”) more than they did to the examples given in Item 2 (“city hall or post offices”). This lack of differentiation between the examples muddied the constructs and lowered their validity. A few respondents, for instance, wondered why places of worship were included in the first example alongside commercial establishments, and not included alongside the more civic spaces in the second item.

Much of the other variation in how the respondents interpreted show card’s items related to how they interpreted these core constructs alongside the term “accessible.” Across all of the items, respondents generally identified “accessible” in two ways (similar to what was seen previously in the Broad Environment questions): either meaning *available or convenient* or *specifically designed for someone with disabilities*. So, for instance, some respondents understood “accessible public transportation” (the fifth item on the card) to mean public transportation with handicap modifications such as ramps or special seats, while just as many understood it to mean public transportation that was easy or convenient to get to.

A number of respondents explicitly noted the multiple denotations of the term. For instance, one respondent noted: “So accessible can mean two things: ADA [American Disability Act] compliant or



easy to get to.” Cases like this, where a respondent understood (and eventually judged) both constructs, was not uncommon. This same respondent was unable to give a response, and explained by saying:

Well I mean it again it’s how you define accessible. The first five I interpret as being referring to ADA. But having roads, paths, and trail as opposed to mud.

A few other minor interpretations of “accessible” emerged as well. One respondent understood accessible to mean she could *practically use* a facility. She explained: “[Accessible means] like I’m able to go there...So accessible there [on the card] would be like a gas station or a McDonalds but not a fancy restaurant.” This interpretation of accessible is both spatial and economic—a place would need to be geographically located somewhere the respondent could get to, AND be within her financial means.

Additionally, some respondents expressed their confusion with how the ADA-compliant interpretation of “accessible” related to the core construct under question. For example, one respondent explained his “no” answer to Item 6 by saying:

Accessible roads and paths and trails... I wonder what that means. I’m thinking I’ve never seen an accessible hiking path.

This problematic interaction between the core construct and the term “accessible” was most pronounced in Item 6—“accessible roads, paths, and trails”—and Item 3—“accessible signage and way finding.” By a large, respondents—both those who noted capacity issues elsewhere in the MDS survey and those who did not—had a very difficult time conceptualizing how either a sign or a road could be accessible.

*Judgment of Use:* Once respondents interpreted the various constructs, they then determined if they did or did not use an item. For those respondents who did not believe that an accessible feature on the show card existed (or that they had access to), they quickly answered “no” to the item. On the other hand, those respondents who indicated that they did indeed have access to an accessible feature then judged whether or not their use and need qualified as either a “yes” or “no” answer for Qs AA5. Respondents judged their answer to Question AA5 using two pathways: whether they actually use the accessible feature, or simply whether the accessible feature exists.

For the first of these pathways, the respondents not only had to know that a feature—such as an accessible public toilet—existed, but that they used it as well. Depending on the respondents’ interpretation of the term “accessible” this judgment was thus about either availability (for those respondents who conceptualized accessible as available or convenient), or need (for those respondents who conceptualized accessible as ADA compliant). This latter interpretation is important. Even if a respondent understood an accessible toilet to be one with (for instance) wide stalls and grab bars, and even if they could physically access such a toilet, they would answer “no” because they did not need the accessible feature. For example, one woman who answered “no” to public transportation noted that she was specifically thinking about the reserved seats at the front of the bus. When asked to explain why she answered “no” to the item, she said, “I would say no because I don’t need them.”

The second of the two pathways is much simpler. These respondents all reported “yes” to the item in question, because they knew that the particular accessible feature existed. For instance, one respondent who answered “yes” to both the first two items explained that she was thinking about ramps and automatic door buttons. She went on to note that she did not necessarily use these features, but that they

were there in case some people did need them. In short, these respondents were answering the question, “Do you see any of these things [on the show card] in your day-to-day life?”

*Cross-Questionnaire Analysis:* There were again some small differences between how the respondents interpreted Questions AA5 and AA6 between the two versions of the questionnaire. As seen throughout the Assistive Device and Broad Environment sections, respondents who received the unframed Version A were much more likely than those who received the framed Version B to not think about health or disability-related constructs. In this case, the Version A respondents were more likely to conceptualize “accessible” as available or convenience, while most Version B respondents thought about “accessible” in terms of something being modified for individuals with disabilities.

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## APPENDIX A:      DISABILITY STATUS CODING CRITERIA

This report includes analysis based on the disability status of the respondents, following the hypothesis that the disabled and health populations may interpret some questions differently from one another. While respondents were recruited into the cognitive interviewing sample based on the presence or absence of certain pre-existing health conditions, the cognitive interview itself provides extensive data that allows for a more comprehensive, transparent, and consistent classification of respondents' health status. This rich, thick data was used to create and apply a disability classification system for the respondents. The following rules determined the respondents' classification:

Respondents were labeled as having a “physical disability” if any of the following criteria were met:

- If respondents indicated that they use any of the mobility devices on Question AA3 besides option (1) “orthopedic footwear.”
- Respondents indicated impediments with getting out of their home, walking, or self-care; answered 2 or higher on Question(s) F1, F2, or F4.
- Indicated vision loss; responds yes on Question HC1.
- Indicated hearing loss; responds yes on Question HC2.
- Expressed more than “some difficulty” walking or climbing steps; 3 or greater on Question C1.
- Claimed to have “some difficulty” (or greater) with walking 100 meters on level ground; answered 2 or greater on Question C2.
- Indicated “some difficulty” with shortness of breath; answered 2 or greater on Question C9.
- Expressed difficulty in doing household tasks because of health; responded 2 or greater on Question C14.

Respondents were labeled as having a “mental disability” if any of the following qualifications were met:

- Indicated depression or anxiety; responded yes to Question HC12
- Indicated other mental or behavioral disorders on Question HC23
- Has difficulty with self-care due mental ability. Respondents indicated difficulty with in Question C3 or problems with self-care on Question F4 (respondent manuscripts had to be evaluated).
- Indicated depression more frequent than “some days” on Question C10.

Given this classification scheme, the respondents were distributed across the two questionnaires in the following way:

**Appendix Table 1: Distribution of Respondents by Disability Statuses**

|                  | No Disability | Only Physical Disability | Only Mental Disability | Physical and Mental Disability |
|------------------|---------------|--------------------------|------------------------|--------------------------------|
| <b>Version A</b> | 5             | 8                        | 3                      | 7                              |
| <b>Version B</b> | 5             | 7                        | 4                      | 12                             |
| <b>Total</b>     | 10            | 15                       | 7                      | 19                             |

For the analysis throughout the report, we commonly collapsed these four categories into two: Physically Disability (Only Physical Disability, and Physical and Mental Disability) and No Physical Disability (No Disability and Only Mental Disability). The distribution across the two questionnaire versions of this division is as follows:

**Appendix Table 2: Distribution of Respondents by Collapsed Disability Statuses**

|                  | <b>Physical Disability</b> | <b>No Physical Disability</b> |
|------------------|----------------------------|-------------------------------|
| <b>Version A</b> | 15                         | 8                             |
| <b>Version B</b> | 19                         | 9                             |
| <b>Total</b>     | 34                         | 16                            |