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Novel Insights From Interviewer Assessments of Personal Attributes, Home Environment, and Residential Context in NSHAP

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Abstract

Objectives: This study was aimed to describe the interviewer-assessed measures present in the 2015/2016 Round of National Social Life, Health, and Aging Project (NSHAP), outline strengths of interviewer-assessed measures, and explore how interviewer assessments in the domains of home environment and personal characteristics are associated with older adult health.

Method: Data come from the 2015/2016 Round of the NSHAP.

Results: We provide descriptive results from the interviewer assessments of personal attributes, indoor home environment, and outdoor residential context. We present an illustrative analysis of reports of falls, a health outcome that might be predicted by characteristics assessed by the interviewer, and we suggest directions for further research.

Discussion: Interviewer assessments collected in NSHAP are useful as proxy measures and can be used in combination with respondent's reports and ecological measures to generate insights into healthy aging.

Keywords: Interviewer assessments, Interviewer-rated health, Older adults, Residential context

Interviewer assessments, also referred to as interviewer ratings or interviewer observations, are used in surveys to assess characteristics of respondents, such as hearing, characteristics of the interior and exterior of their places of residence, and characteristics of the neighborhoods in which respondents live. The National Social Life, Health, and Aging Project (NSHAP) has included interviewer assessments in each round of data collection. Interviewer assessments bring a number of benefits to survey data collected through personal interviews. First, they can be done without imposing burden on respondents, as they are completed by the interviewer alone, after the

in-person interview has concluded. As such, they are relatively low cost, taking little of the interviewer's time or effort beyond that required for the in-person interview. Second, they provide an external assessment from a trained interviewer of key attributes of respondents and their residential environments. Third, and perhaps most important for many purposes, interviewers can be asked questions that might be too embarrassing or sensitive to be asked of respondents themselves. Such questions that probe how a respondent is perceived by others are valuable for clarifying the links between social interactions and health.

The interviewer assessments obtained in NSHAP include questions about the personal attributes of respondents as well as novel measures of household and neighborhood. Here, we describe these measures in detail, including their distribution in the 2015/2016 sample (“Round 3” or the “2015 Round” hereafter) and share results from an illustrative analyses using the 2015 Round data. We used fall risk as the outcome in our example analyses because it is an important health outcome for community-dwelling older adults, which evidence suggests depends at least in part on characteristics of the respondent, their home environment, and their neighborhood (Schafer & Upenieks, 2015). We also discuss ongoing challenges in interpreting interviewer-assessed measures and the potential to further clarify methodological and substantive questions through future research.

Background

While external ratings of an individual’s health conducted by a medical professional are commonly used in clinical practice and research settings (Westen & Weinberger, 2004), interviewer ratings are still gaining popularity in social survey-related work (West, 2013). Outside of the clinical setting, assessments or ratings by an external observer are often referred to as “interviewer observations” or “paradata” (West, 2013). One stream of the literature has explored the potential for interviewer observations to be used to adjust for nonresponse bias in survey research (Sinibaldi et al., 2014; West, 2013). Interviewer observations have been found to be a helpful tool in accounting for nonresponse bias (Kirchner et al., 2017; Kreuter, 2013).

Beyond their importance as a behind-the-scenes methodological tool, interviewer assessments are a promising direction for advancing survey-based research on health in older adulthood for substantive reasons. First, against the backdrop of countless studies underscoring the importance of social interaction for healthy aging, interviewer assessments can provide insight into how an older adult presents socially and is perceived by others. Interviewers can comment on topics that are socially consequential, but otherwise difficult to measure. When interviewers make observations about respondent attributes that respondents cannot observe reliably in themselves, such as stomach shape, posture, hygiene, attractiveness, and personality, they may capture information that is highly relevant to the respondent’s social life and their perception by others, from family and friends to medical providers. For example, a recent study by Monk and colleagues (2021) used interviewer-assessed physical attractiveness to demonstrate that lookism and colorism are highly consequential for income inequality in the United States, especially for Black women. In another example of an otherwise difficult to assess measure, scholars used interviewer assessments of parenting style to better study how family income matters for child development (Yeung et al., 2002).

Second, longitudinal data from interviewer assessments, such as that available in NSHAP or other longitudinal surveys, make it possible to investigate how an individual’s personal attributes and physical environment change over time and how this change relates to other transitions of interest. For example, using longitudinal data, Schafer and Upenieks (2015) found that interviewer-assessed household disorder and neighborhood disorder were associated with increased fall risk in the subsequent 5 years. In another longitudinal approach, interviewer assessments taken at baseline were used to predict survival over 17 years (Ironson et al., 2021).

A third reason interviewer assessments lend themselves to substantive contributions is that an interviewer can provide an alternative assessment of dimensions of social context or health status that are generally self-reported by the respondent. This is important because interviewer assessments can help researchers avoid biases potentially introduced by self-report. Although self-reported measures of health and well-being have been shown to be highly predictive of underlying health status and later health events (Borawski et al., 1996; Idler & Benyamini, 1997), respondent gender, mood, cognition, or other factors may influence self-reports, creating measurement bias. Interviewer assessments are one way to circumvent social desirability bias or other measurement biases that are unavoidable in self-reported measures. Interviewer assessments can complement self-reported measures or clinical diagnoses by providing direct observations that are not constrained by the same assumptions or perspectives. In fact, interviewer-assessed cognitive impairment in the Health and Retirement Study had lower predictive validity than professional assessment (Crimmins et al., 2011), and interviewer-assessed respondent health better predicted subsequent mortality than self-reports or physician reports in the Chinese Longitudinal Health Longevity Study (Feng et al., 2016). Whether interviewer assessments and self-reports measure the same construct depends on the dimension of health or aging that is being assessed. In the case of physical function of older adults, evidence suggests that self-reports and interviewer assessments measure distinct constructs (Reuben et al., 1995). In general, interviewers may give more importance to visible physical attributes than to psychological or cognitive attributes when assessing dimensions of respondent health and aging (Smith & Goldman, 2011). Still, it may be precisely *because* interviewer assessments are differently weighted than self-reports that they have been found to be better predictors of health (Schreier & Chen, 2017). For example, when strangers guess an individual’s age from a photograph, this measure of perceived age is just as good a predictor of survival as actual age and is correlated with functional and molecular phenotypes associated with aging (Christensen et al., 2009). Interviewers may rate respondents based on a referent scheme that allows for more stable and objective comparison than respondent self-assessments (Feng et al., 2016), while at the same time they may introduce new biases.

Although field interviewers are trained to be consistent in approach, there is a subjective component to their assessments that introduces additional variance into the measurement of population parameters of interest (West et al., 2017). When the variance is patterned in nonrandom ways, it can bias results. For example, interviewers tend to rate adolescent respondents with higher body mass index as unattractive (Richmond et al., 2012). Interviewer bias can be dealt with in different ways depending on the theoretical research question and assumptions made about the variables measured using interviewer observations. Because interviewers typically carry out multiple interviews, it is possible to assess “interviewer effects” in their ratings using interviewer fixed effects or multilevel modeling approaches (West & Blom, 2017). Controlling for interviewer fixed effects is a useful approach for eliminating the influence of between-interviewer variation. A similar approach is to standardize ratings within interviewer. For example, in her research on residential context and aging outcomes using NSHAP, York Cornwell standardized interviewer-assessed household disorder scores to adjust for heterogeneity across interviewers and ease interpretability of results (York Cornwell, 2016). A third approach is to estimate random effects for interviewers with a multilevel model, as we do here in the illustrative analysis on fall risk, or a cross-classified multilevel model (Vassallo et al., 2015). Finally, there are instances when interviewer bias is the object of study rather than a source of variance that must be adjusted away. For example, Monk and colleagues (2021) studied how the racial and gender bias in an interviewer-rated physical attractiveness measure is consequential for earnings. In this paper, they used the bias inherent to interviewer assessments as a proxy for the processes of bias and discrimination that people may face in the labor market.

The 2015 Round of NSHAP includes interviewer assessment measures of personal attributes, home environment, and residential context asked in previous rounds. These repeated measures can be used to study trajectories over 5 or 10 years and to study predictors of change in these measures or how they matter for health declines. Still, the subjective nature of interviewer assessments can prove a challenge in longitudinal studies because the turnover of interviewers across survey rounds is likely to limit the reliability of repeated interviewer assessments. Methods that account for interviewer random effects (Hox, 1994; Vassallo et al., 2015), that adjust for interviewer effects with a weighted combination of multiple interviewers (Lynn et al., 2011), that standardize within each interviewer (see Schafer & Upenieks, 2015), or that combine interviewer-assessed measures with self-reported or objective measures of the same variable of interest (see Schumm et al., 2009 for a related example) are all promising approaches for rigorous longitudinal analyses using interviewer assessments.

The 2015 Round also introduces several novel measures that capture new dimensions of residential context and home accessibility. Looking at recent studies using NSHAP

interviewer assessments, we see they have been used to measure constructs of theoretical importance in diverse ways: as the primary exposure of interest (e.g., Schafer & Upenieks, 2015), as the outcome (e.g., Upenieks et al., 2019), or as part of a dynamic model over time (e.g., York Cornwell, 2016). In the following sections, we review the origins and applications of the NSHAP interviewer assessments by domain.

Interviewer Assessment of Personal Attributes

All rounds of NSHAP include interviewer assessments of respondent physical appearance and presentation. The measures for physical attractiveness, personality attractiveness, and grooming were adapted from the National Longitudinal Study of Adolescent Health (Add Health), and the measures for posture, stomach shape, and body shape were adapted from the Chicago Health and Social Life Survey. The hygiene measure was developed by NSHAP investigators. These measures aim to capture both the respondent's physique (e.g., posture, stomach shape) and the respondent's personal care habits (e.g., being well-dressed, hygienic; Waite et al., 2006). Interviewers are instructed that physical appearance measures involve anything on or about a person that is visible to a casual onlooker (Waite et al., 2006). The physical attractiveness, personality, and grooming measures from Add Health have been used to study academic performance in high school (French et al., 2009). Few studies have used these or similar interviewer-assessed measures of personal attributes to better understand aging processes, yet these measures can provide a snapshot of functional limitations and both physical (Feng et al., 2016) and cognitive aging (Crimmins et al., 2011). Interviewer-assessed hygiene, for example, may reflect functional limitations, as well as psychological or cognitive conditions that affect self-care (Upenieks et al., 2019). Similarly, poor posture might increase risk of falls due to a less-stable position when upright or restrictions of visual field, or it may indicate an underlying condition that would increase fall risk, such as poor balance, kyphosis, cognitive decline, or muscle loss (Kado et al., 2007).

Interviewer Assessment of Home Environment and Residential Context

Aging is associated with increased sensitivity to the conditions in one's home and neighborhood (Cornwell & Cagney, 2010), which makes measures of these factors especially valuable in studies of older adults. The majority of quantitative studies of the effects of residential context on health draw on Census measures such as neighborhood poverty (Yen & Syme, 1999). Scholars have discussed the limitations of using Census tract characteristics as a proxy for an individual's experience of the physical and social context of where they live (Riley, 2018). Interviewer-assessed home conditions, street conditions, or neighborhood

characteristics can complement the information aggregated at the Census tract-level and may be more relevant to aging outcomes.

The use of assessments of the physical home environment in NSHAP borrows from methods of systematic observation of neighborhood disorder (Raudenbush & Sampson, 1999) and was motivated by a literature that suggests disorder in the residential context is associated with poor health (Ross & Mirowsky, 2001; Wen et al., 2003). The measure of the structure of the respondent's home is adapted from the General Social Survey and the measure of how well-kept the respondent's building and surrounding buildings are adapted from the National Longitudinal Study of Adolescent Health. The other interviewer assessments of residential context, such as indoor cleanliness and indoor smell, are original to the NSHAP (Waite et al., 2006).

NSHAP's 2010/2011 Round introduced interviewer assessments of neighborhood physical conditions, such as dilapidated buildings, litter, and traffic, which were based on the ecometric scales originally developed by the Project on Human Development in Chicago Neighborhoods investigator team (Raudenbush & Sampson, 1999). In the 2015 Round, some residential context variables, such as neighborhood safety, are assessed by both respondents and interviewers. Neighborhood and home environment interviewer assessments were combined in a recent study by Lee and Waite (2018) to contextualize cognitive aging. Details on the development of NSHAP's interviewer assessments of neighborhood characteristics introduced in 2010, and guidance for combining the items into scales, can be found in an article by York Cornwell and Cagney (2014).

In addition to the rich literature on neighborhood health effects that uses data from interviewer observations (e.g., Grafova, 2008), there is a long-standing literature on the physical home environment and its influence on aging outcomes, particularly physical health and functional limitations, and more recently, mental health (Trecartin & Cummings, 2018). Physical home environment is commonly measured objectively by the presence or absence of potential barriers, housing amenities, and physical features of the home environment such as the presence of stairs or the distance from the front entrance to the street (Trecartin & Cummings, 2018). These measures have been found to have low reliability across studies and are not consistently associated with well-being (Trecartin & Cummings, 2018). Many studies also incorporate subjective measures of the home environment through respondent self-report (Gobbens et al., 2018; Oswald et al., 2003; Trecartin & Cummings, 2018). As is the case for respondent characteristics, interviewer assessments provide holistic assessments of household disorder and residential context that capture more than objective description and while also providing a different perspective than self-reports.

Erin York Cornwell (2014, 2016) has pioneered the use of the NSHAP interviewer ratings in her study of the social relevance of the home environment and its consequences

for later-life health. York Cornwell combined interviewer-assessed home environment items into a household disorder scale that she and others have used to study the relationships between home environment and several health and social variables (Kim & Waite, 2016). York Cornwell (2016) argues that household disorder reflects a lack of social support in the household. Her analyses of interviewer assessments in previous rounds of NSHAP show that low-income and African American older adults are rated as having more disordered living conditions, as are individuals with poorer physical and mental health (York Cornwell, 2014).

Illustrative Analyses With the 2015 Round Interviewer Assessment Data

The interviewer assessments introduced in the NSHAP 2015 Round extend the potential for methodological and substantive insights with new measures of home accessibility and neighborhood social cohesion, amenities, safety, and surveillance by others. The new measure of interviewer-assessed home accessibility, for instance, reveals how difficult it is to enter a respondent's home—a variable that when self-reported can be confounded by health and disability status and which may proxy for other important variables such as socioeconomic status, barriers to regular physical activity, and ability to age in place. In order to make the assessment comparable across interviewers, the prompt references the rolling suitcase all interviewers carry into the respondent's home. NSHAP's interviewer-assessed home accessibility measure is conceptually similar to measures of home accessibility used in other studies. For example, the Health and Retirement Study includes a dichotomous measure of home accessibility based on whether the living space is all on one floor (Park et al., 2019).

According to person-environment fit theory, the congruence between an older adult's changing needs and their home environment is consequential for their independence in later life (Lawton et al., 1980). As an older adult progresses toward frailty, or simply experiences changes in their posture and stability, home accessibility is likely to become increasingly important for their ability to avoid falling. Falls are a serious but avoidable health event for older adults. Mindful of prior work on household disorder's association with fall risk (Schafer & Upenieks, 2015), we hypothesized that home accessibility may be predictive of falls among community-dwelling older adults. Here, we conduct an illustrative analysis estimating the association between home accessibility and falls in the previous 12 months as a way of exploring predictive validity of this novel interviewer assessment. We compare the strength of association for home accessibility to that for respondent posture, an interviewer-rated measure previously shown to be associated with fall risk (Kado et al., 2007), and we test whether the effect of home accessibility is moderated by posture.

In a separate set of descriptive analyses, we focus on a different interviewer assessment—respondent stomach shape—providing examples supportive of construct validity and attempting to quantify interviewer bias. Because NSHAP also collects anthropometrics, such as waist circumference and biomeasures such as blood pressure, it is possible to gain insight into construct validity and interviewer bias of the stomach shape measure. To do so, we explore how interviewer ratings of stomach shape correspond to gender-specific measurements of waist circumference. We also compare the prevalence of hypertension across interviewer ratings of stomach shape. As these analyses intend to illustrate, the NSHAP interviewer assessments can be leveraged to move the field forward by contextualizing older adult health through intimate glimpses of the characteristics and conditions associated with healthy aging.

Method

Sample

Data come from the NSHAP 2015 Round. NSHAP began in 2005 with a nationally representative sample of 3,005 community-dwelling older adults aged 57–85. This original cohort has been followed through two subsequent waves with 5-year intervals. 2015 is the third wave. In the 2010 Round, spouses/partners of the original cohort were added as respondents. In the 2015 Round, a new Baby Boomer cohort was added to replenish the sample and permit cohort comparisons. For the purposes of this study, we use data from the 2015 Round, which includes 4,604 community-dwelling respondents born 1920–1965. In-home interviews in NSHAP were carried out by a team of 142 highly trained field interviewers. Each field interviewer interviewed 0.1%–2.0% of respondents. To the extent possible, respondents and interviewers were matched on race/ethnicity. All descriptive results and analyses presented employ the 2015 survey weights.

Measures

Immediately after completing each in-person interview, interviewers retreated to a private location to respond to questions about the respondent, the respondent's home environment, and the neighborhood in which the interview took place, which was almost always the respondent's residence. Interviewers were asked to rate respondents on a variety of personal characteristics using 5-point or 4-point Likert scales. Interviewers also assessed cleanliness, tidiness, noise, lighting, and smells present in the room in which the interview was conducted. These measures of indoor home conditions have been used in previous studies to form a scale of household disorder (York Cornwell, 2016; Cronbach's alpha = .87). In addition, interviewers provided information on the type of housing structure (e.g., single-family home) as well as ratings of the building and the street

on which it is located. As in previous rounds, interviewers assessed street cleanliness, street noise, street traffic, the density of houses, outdoor smell, and air pollution.

For the 2015 Round of data collection, NSHAP added a new measure of interviewer-perceived home accessibility. Because all field interviewers bring a rolling suitcase with their survey materials into the home to conduct the interview, each could evaluate the relative ease or difficulty of doing so. This provides a quasi-standardized assessment of accessibility to each respondent's residential entrance. The resulting measure is especially relevant for studies of activity limitations and functional health outcomes, such as falls. Additional questions introduced in the 2015 Round ask interviewers how safe and comfortable they felt in the neighborhood, whether their presence was noticed by neighbors, and how many amenities (e.g., parks and grocery stores) they observed. These provide novel outside assessments of key neighborhood characteristics. For a complete list of the interviewer-assessed measures continued from previous rounds and added in the 2015 Round, see [Table 1](#). The NSHAP interviewer assessment variables are available in the "core" data files for the corresponding survey round as part of the public-release data which can be downloaded from the ICPSR website. For a cross-walk table that shows which specific interviewer assessment variables are available in each survey round, please see [Supplementary Table S1](#).

Analytic Approach

We conducted descriptive analyses to summarize interviewer assessments of personal attributes, indoor home environment, and outdoor residential context. As a first illustrative analysis, we present average waist circumference and average hypertension prevalence grouped by interviewer-rated stomach shape, measured on a 5-point Likert scale from flat (1) to pot belly (5). As a second illustrative analysis, we used fall risk as an outcome to evaluate predictive validity of the new home accessibility measure. Specifically, we used mixed-effects logistic regression to test the association between interviewer-rated home accessibility and risk of falling at least once in the previous 12 months. We also tested whether the association between home accessibility and fall risk varied by a four-category measure of interviewer-rated posture (from straight to stooping) and how it compared to the strength of the association with stooping posture, which has been previously shown to predict fall risk (Kado et al., 2007). Home accessibility was assessed using a 4-point Likert scale, but we combined categories 3 (difficult) and 4 (very difficult) because few respondents lived in homes that were rated "very difficult" to access. All models control for age (continuous), gender, and poor/fair self-rated health (dichotomous), and account for possible heterogeneity in interviewer effects using interviewer-level random intercepts. The models estimated using logistic regression with interviewer fixed effects are provided in [Supplementary Table S2](#).

Table 1. Interviewer Assessment Items Included in NSHAP 2015/2016 Round

NSHAP constructed variable	Question and response options
Personal attributes	
Respondent's functional health and behavior	Please rate the respondent's functional health and behavior during the interview on the following scales:
Hearing	1–5 or Don't know 1 = Practically deaf 5 = Normal hearing
Vision	1–5 or Don't know 1 = Practically blind 5 = Normal vision
Literacy	1–5 or Don't know 1 = Unable to read 5 = Normal adult literacy
Description of the respondent	
Physical attractiveness	Describe the respondent using the following scales: 1–5 or Don't know 1 = Physically attractive 5 = Not physically attractive
Personality	1–5 or Don't know 1 = Attractive personality 5 = Not attractive personality
Well-dressed	1–5 or Don't know 1 = Well-dressed 5 = Poorly dressed
Hygiene	1–5 or Don't know 1 = Hygienic 5 = Not hygienic
Posture	1–5 or Don't know 1 = Straight posture 5 = Stooped/slouching
Body shape	1–5 or Don't know 1 = Flat stomach 5 = Pot belly
Weight	1–5 or Don't know 1 = Thin 5 = Obese
Clarity of speech	1–5 or Don't know 1 = Spoke clearly 5 = Did not speak clearly
Skin color ^a	Options were displayed visually with a skin tone palate. See Monk and Kaufmann (forthcoming) for details.
Candid	How candid was the respondent? 1–4 or Don't know 1 = Probably not candid at all 4 = Entirely candid
Difficult case	How difficult was this case to get? (1–4) 1 = Very difficult 4 = Not at all difficult
Home environment	
Description of the interview location	
Cleanliness	1–5 or Don't know 1 = Clean 5 = Dirty
Tidiness	1–5 or Don't know 1 = Neat and tidy 5 = Messy

Table 1. Continued

NSHAP constructed variable	Question and response options
Indoor noise	1–5 or Don't know 1 = Quiet 5 = Noisy
Space	1–5 or Don't know 1 = Cramped 5 = Spacious
Clutter	1–5 or Don't know 1 = Very cluttered 5 = Not cluttered
Indoor odor	1–5 or Don't know 1 = No smell 5 = Strong smell
Type of odor	1–5 or Don't know 1 = Pleasant smell 5 = Unpleasant smell
Home accessibility ^a	Considering the structure and accessibility of the respondent's residence, how difficult was it for you to get your survey suitcase inside the respondent's house/apartment? Very difficult Difficult Easy Very easy Don't know
Residential context	
Respondent's home and neighborhood area	
Type of structure	Type of structure in which the respondent lives: Trailer Detached single-family house Two-family house, two units side-by-side Two-family house, two units one above the other Detached three- to four-family house Row house (three or more units in an attached row) Apartment house (five or more units, three stories or less) Apartment house (five or more units, four stories or more) Apartment in a partly commercial structure Assisted living facility or group home Nursing home Other (specify) Don't know
Well-kept building	How well-kept is the building in which the respondent lives? Very poorly kept (needs major repairs) Poorly kept (needs minor repairs) Fairly well-kept (needs cosmetic work) Very well-kept Don't know
Well-kept street	How well-kept are most of the buildings on the street (one block, both sides) where the respondent lives? Very poorly kept (needs major repairs) Poorly kept (needs minor repairs) Fairly well-kept (needs cosmetic work) Very well-kept Don't know

Table 1. Continued

NSHAP constructed variable	Question and response options
Home comparison	Compared to other houses/apartments in the neighborhood, would you say that the respondent's house/apartment was: Far below average Below average Average Above average Far above average Don't know
Description of the street	Describe the street (one block, both sides) where the respondent lives, using the following scales:
Street cleanliness	1–5 or Don't know 1 = Clean 5 = Full of litter or rubble
Street noise	1–5 or Don't know 1 = Quiet 5 = Noisy
Street traffic	1–5 or Don't know 1 = No traffic on the street 5 = Heavy traffic on the street
Density of homes	1–5 or Don't know 1 = Buildings/houses are close together 5 = Buildings/houses are far apart
Smell or air pollution	1–5 or Don't know 1 = No smell or air pollution 5 = Strong smell or air pollution
Interviewer perceptions of the neighborhood area	Select your response to the following statements based on your observation of the area where the respondent lives:
Area safety ^a	1–5 or Don't know 1 = I felt comfortable 5 = I felt uncomfortable
Area comfort ^a	1–5 or Don't know 1 = I felt safe 5 = I felt unsafe
Area amenities ^a	1–5 or Don't know 1 = I saw many amenities (grocery stores, parks) 5 = I saw few amenities
Presence noticed ^a	1–5 or Don't know 1 = I felt like people in the area noticed my presence 5 = They did not notice my presence

Notes: NSHAP = National Social Life, Health, and Aging Project.

^aItem added in 2015/2016 Round.

Results

Descriptive statistics for the 2015 Round interviewer-rated measures are shown in [Supplementary Table S3](#). Most of the interviewer assessments use a 5-point scale, sometimes with the normative or healthful outcome being anchored as 1 as in the case of hygiene, sometimes with the normative or healthful outcome being anchored as 5 as in the case of hearing, and sometimes with a more value-neutral scale as in the case of indoor space. Several items have a skewed distribution such that the majority of respondents are rated at one end of the scale. For the skewed items, the tail of the

distribution may highlight respondents with health or functional vulnerabilities. Some items (e.g., traffic, indoor and outdoor noise, and how well-kept the respondent's building was) did not differ by gender, while other items did (e.g., personality attractiveness, hygiene, stomach shape, and indoor cleanliness), with women being assessed to have, on average, more attractive personalities, better hygiene, better indoor cleanliness, and less-protruding stomachs than men. Other items differed by age, such as respondent hearing, vision, and indoor cleanliness. Hearing and vision worsened with age. Interestingly, indoor cleanliness improved

with older age and the gender differences in cleanliness that were apparent for ages 50–79 were gone for ages 80–95. Exposure to area amenities was normally distributed, with 13% of respondents in a high amenities area and 17% in a low amenities area. Area safety was strongly right-skewed with interviewers reporting they felt safe in 84% of respondent neighborhoods. Interviewers rated street noise as quiet 58% of the time, and they noted heavy street traffic in only 2% of cases and no street traffic in 40% of cases. They noted no strong smell or air pollution in 77% of cases. The novel home accessibility measure had a right-skewed distribution with interviewers rating 88% of respondent homes as “very easy” or “easy to access” with their survey suitcase.

In Table 2, we present the bivariate associations between interviewer-rated stomach shape, and two related objective measures: waist circumference and hypertension. We found that an interviewer-rated stomach shape of 1 (flat stomach) corresponds to a mean waist circumference of 33.2 inches, while an interviewer-rated stomach shape of 5 (pot belly) corresponds to a mean waist circumference of 49.9 inches (see Table 2 for all corresponding values). The high correspondence between these two measures helps to establish construct validity for interviewer-rated stomach shape.

To illustrate interviewer variance in the stomach shape measure, we examined the range of stomach shape ratings given to women measured to be 64 inches in height with a waist measurement of 38 inches (the modal waist size for that height). Despite their identical height and waist circumference, the stomach shape ratings assigned to them by their interviewer ranged from 1 to 4 on the 5-point scale (Table 3).

To evaluate construct validity among the residential context measures, we compared respondent ratings of neighborhood safety with the interviewer ratings of area safety and area comfort. There was general agreement between respondents and interviewers on the items for neighborhood safety, but there was notable moderation by respondent race in interviewer responses such that interviewers reported feeling less safe and less comfortable in the neighborhoods of Black respondents than in other neighborhoods. For instance, interviewers reported feeling fully safe in only 60% of Black respondents’ neighborhoods, while they felt fully safe in 90% of White respondents’ neighborhoods. Home accessibility ratings were also patterned by race/ethnicity such that interviewers rated homes as “difficult” or “very difficult” to access for 18% of

non-Hispanic Black respondents, 15% of non-White, non-Hispanic respondents of another race, 12% of Hispanic/Latinx respondents, but only 10% of non-Hispanic White respondents. It is unclear to what extent these patterns reflect the racialized inequities in housing and neighborhood conditions or interviewer biases, or both. Comparing mean interviewer-assessed home accessibility by type of home showed that two-family homes arranged one above the other and apartments in a partly commercial structure were most difficult to access, and detached single-family houses were the easiest to access (Table 4).

To assess the predictive validity of the novel measure of home accessibility, we compared the associations between interviewer-assessed home accessibility and falls in the previous 12 months, interviewer-assessed posture and falls, and the interaction of the two and falls, controlling for age, gender, and self-rated health and estimated interviewer-level random intercepts. Interviewer-rated posture is strongly associated with falls such that respondents who are rated poorly (4 or 5 stooped/slouching) on the 4-point scale for posture are four times more likely to have experienced a fall in the past year than those with straight posture (Table 5, Model 1). Living in a home that was not rated “very easy” to access by interviewers was also associated with an increased risk of falling with older adults living in difficult or very difficult to access homes being 1.4 times more likely to have fallen in the previous 12 months (Model 2). The association between low home accessibility and falls was attenuated in the model that controlled for posture (Model 3) and in the interaction model (Model 4), there was only a marginally significant

Table 3. Interviewer-Rated Stomach Shape Among Women 64 Inches in Height and 38 Inches in Waist Circumference

	Waist circumference (inches)	Height (inches)	Frequency
Stomach shape 1 (flat stomach)	38	64	1 (11%)
Stomach shape 2	38	64	3 (33%)
Stomach shape 3	38	64	3 (33%)
Stomach shape 4	38	64	2 (22%)
Stomach shape 5 (pot belly)	38	64	0 (0%)

Table 2. Correspondence Between Interviewer-Rated Stomach Shape, Waist Circumference, and Hypertension

	Waist circumference (mean in inches)	Ever-diagnosed with hypertension (proportion)
Stomach shape 1 (flat stomach)	33.2	0.34
Stomach shape 2	36.5	0.41
Stomach shape 3	40.2	0.54
Stomach shape 4	44.2	0.61
Stomach shape 5 (pot belly)	49.9	0.70

interaction between stooping posture and “easy” (compared to “very easy”) home accessibility, suggesting that stooping posture may be slightly more associated with falls when a respondent’s home does not have the highest accessibility rating.

Discussion

This article describes the interviewer assessments included in NSHAP’s 2015 Round. The descriptive results we present here demonstrate correspondence between several

respondent-assessed and interviewer-assessed measures of personal attributes and residential context. Many interviewer assessments were patterned by gender, age, or race/ethnicity. For example, while interviewer-rated hearing and vision worsened with age (as expected), interviewer-rated indoor cleanliness improved with age which raises the possibility that cohort differences or differences in assistance received from caregivers are driving some of the variation across age categories.

Illustrative analyses linking interviewer-assessed measures to fall risk revealed associations that are consistent with the expectations from the literature: (a) interviewer-assessed posture is associated with falls in the previous 12 months and (b) interviewer-assessed home accessibility is marginally associated with falls when posture is not straight. Further research is needed to clarify the possible bidirectional nature of the posture–fall association and to clarify why posture appears to confound the association between home accessibility and falls.

Like any measure, interviewer assessments may be subject to bias. It is difficult to directly assess interviewer bias for most of the interviewer assessments in NSHAP because the interviewer bias (or measurement error) cannot be distinguished from the true value and variance in the true value. Still, in some cases, it is possible to find patterns in the data that suggest interviewer bias in the aggregate. For instance, interviewer-rated neighborhood safety was patterned by race/ethnicity such that even when restricting the sample to older adults who self-report that their neighborhood is very safe (“strongly disagree that people feel afraid at night”), the neighborhoods of Black

Table 4. Mean Home Accessibility (1 [very easy] to 4 [very difficult]) by Type of Home

	Home accessibility (mean)
Trailer	1.95
Detached single-family house	1.69
Two-family house, side-by-side	1.78
Two-family house, one above other	2.45
Detached three- to four-family house	1.72
Rowhouse (three or more units)	1.74
Apartment house (five or more units, less than four stories)	1.98
Apartment house (five or more units, four or more stories)	1.90
Apartment in a partly commercial structure	2.33
Assisted living facility or group home	1.7
Other	1.72
Don't know	1.67

Table 5. Interviewer-Assessed Posture, Interviewer-Assessed Home Accessibility and Fall Risk in Previous 12 Months

Risk of falling at least once in previous 12 months	(1)	(2)	(3)	(4)
Posture (ref. = 1 “straight”)				
Posture = 2	1.48*** (0.12)		1.39*** (0.12)	1.33* (0.18)
Posture = 3	2.01*** (0.24)		1.82*** (0.24)	2.19*** (0.37)
Posture = 4/5 “slouched/stooping”	4.09*** (0.73)		3.81*** (0.69)	2.32** (0.66)
Home accessibility (ref. = 1 “very easy”)				
Home accessibility = 2 “easy”		1.26** (0.09)	1.16* (0.09)	1.15 (0.13)
Home accessibility = 3/4 “difficult/very difficult”		1.42** (0.17)	1.24* (0.15)	1.16 (0.27)
Home accessibility × Posture interaction (ref. = 1 Very easy access × 1 Straight posture)				
Easy accessibility × Posture = 2				1.09 (0.18)
Easy accessibility × Posture = 3				0.74 (0.18)
Easy accessibility × Posture = 4/5				2.02* (0.75)
Difficult accessibility × Posture = 2				1.02 (0.32)
Difficult accessibility × Posture = 3				0.92 (0.34)
Difficult accessibility × Posture = 4/5				2.67 (1.60)
Observations	4,454	4,387	4,259	4,259

Notes: All models use mixed-effects logistic regression, controlling for gender, age, and self-rated health, with interviewer random intercepts. Coefficients reported as odds ratios.

*p < .10, **p < .05, ***p < .01, ****p < .001.

older adults are rated, on average, 0.34 points less safe (on a 5-point Likert scale) than the neighborhoods of non-Latino White older adults. Another example comes from interviewer-rated stomach shape, which we combined with the objective measure of waist circumference to gain insight into interviewer variance. In this case, the nine female respondents who were exactly 64 inches in height and had a measured waist circumference of exactly 38 inches had interviewer ratings for stomach shape ranging from 1 (flat stomach) to 4 (nearly a pot belly) on a 5-point Likert scale. Despite their identical height and weight as measured in inches, there was a large range in interviewers' ratings of their stomach shape. Of course, many of the interviewer assessments are subjective in nature and the subjective variation across interviewers is where their value lies. For many research questions, it is not necessary to distinguish between measurement error and interviewer bias. Interview bias can be adjusted for using interviewer fixed effects or random effects, depending on the research question.

Next, we briefly highlight new directions for research using the NSHAP 2015 Round interviewer-assessed measures in the areas of social context and residential context. Beyond direct observations of respondents' personal attributes that may proxy for professional or objective assessments of cognition, frailty, other aspects of physical health, interviewer assessments can help researchers measure how individuals are perceived by others. They can give researchers a perspective on the social context of respondents. As interest in the health effects of loneliness and social isolation grows (Fried et al., 2020), researchers have turned to surveys such as NSHAP to quantify social network characteristics and test their influence on health outcomes (Santini et al., 2020). Most of what we know about the importance of the social environment and social integration for older adult health comes from self-reported, ego-centric network measures that describe one's close confidants (Fried et al., 2020). But, as Goffman emphasized in his now classic work on the presentation of self in everyday life, social interaction is also about how we are perceived by others (Goffman, 1959). Thus, how an individual is perceived by others may be an important aspect of how or why social interaction matters for health. Despite laudable progress to include social network rosters in surveys, certain aspects of social interaction remain unobservable. This is where interviewer assessments come in. The NSHAP 2015 Round includes interviewer assessments of personality, physical attractiveness, hearing, and hygiene—factors relevant to social interaction. These can give researchers a window into how respondents are perceived socially or the dynamic between the respondents and others, which may be relevant for understanding how social presentation and social engagement matter for older adult health. Further research is needed to clarify how one's personal attributes as perceived by others are associated with health status and health risks.

Respondents likely experience their own neighborhoods differently than they are perceived by outside visitors; interviewer assessments provide additional information about residential context that can be used to complement respondent reports and census data. In combination with the interviewer assessments, researchers interested in how the social environment influences health and aging can draw on NSHAP's linkages to Census data and other sources of data on context. Interviewer assessments can be combined with alternative measures to better estimate causal relationships between individual health declines and disorder in the residential context. Further, the data from the multiple cohorts in NSHAP allow researchers to distinguish between age and cohort trends in residential exposures and neighborhood characteristics. Because the interviewer-assessed measures of residential context used in NSHAP are specific to the respondent's street and are not generated from aggregate data, they can complement aggregate data from the Census or other ecological-level data sources. A related new direction for research is the incorporation of Google Maps and Street View data either to validate interviewer observations (e.g., Vercruyssen & Loosveldt, 2017) or to complement them within an analysis. Clarke and colleagues (2010) found that using Google Street View to study neighborhood conditions can be reliable for assessing the presence of amenities and general land use, while in-person observations are still preferred for assessing finer details (i.e., the presence of garbage) or neighborhood characteristics that require a qualitative judgment, such as the quality of street conditions. This combination of interviewer assessments with new sources of observational data on the physical and social environment is an exciting direction for future research. In general, what scholars have learned about interviewer assessment data has focused heavily on the methodological over the substantive. But the future of research using interviewer assessment may need to do both at once—addressing questions of validity and bias in interviewer assessed-metrics through studies that test a substantive hypothesis.

In summary, the interviewer-assessed items provide important independent information to augment self-report or aggregate data and can be useful for generating hypotheses about factors relevant to healthful aging. These relatively simple observations can capture dimensions of older adults' appearance and context that are consequential for health. It is reasonable to wonder whether interviewer assessments are precise enough to serve as meaningful health measures. Indeed, these measures are imprecise and suffer from their own limitations, such as normative biases and limited scope (because interviewers complete these assessments after an intensive face-to-face interview, the battery is relatively short). Still, as our exploratory analyses show, NSHAP 2015 interviewer assessments of personal attributes, home environment, and residential context complement NSHAP survey data and are promising tools for further research.

Supplementary Material

Supplementary data are available at *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences* online.

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Conflict of Interest

None declared.

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