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Gender and the structure of self-rated health across the adult life span

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ABSTRACT

Despite the widespread use of self-rated health (SRH) in population health studies, the meaning of this holistic health judgment remains an open question. Gender differences in health, an issue of utmost importance in population research and policy, are often measured with SRH; the comparisons could be biased if men and women differ in how they form their health judgment. The aim of this study is to examine whether men and women differ in how health inputs predict their health rating across the adult life span.

We use the 2002–2015 National Health Interview Survey data from US-born respondents aged 25–84. Ordered logistic models of SRH as a function of 24 health measures including medical conditions and symptoms, mental health, functioning, health care utilization, and health behaviors, all interacted with gender, test how the measures influence health ratings and the extent to which these influences differ by gender. Using a Bayesian approach, we then compare how closely a select health measure (K6 score) corresponds to SRH levels among men and women.

We find little systematic gender difference in the structure of SRH: men and women use wide-ranging health-related frames of reference in a similar way when making health judgments, with some exceptions: mid-life and older men weigh physical functioning deficits and negative health behaviors more heavily than women. Women report worse SRH than men on average but this only holds through mid-adulthood and is reversed at older ages; moreover, the female disadvantage disappears when differences in socio-economic and health covariates are considered.

Our findings suggest that the meaning of SRH is similar for women and men. Both groups use a broad range of health-related information in forming their health judgment. This conclusion strengthens the validity of SRH in measuring gender differences in health.

1. Gender and the structure of self-rated health across the adult life span

How do men and women form their self-rated health judgment? Do they differ in what health dimensions matter most? And do any observed patterns hold across the adult life span?

Self-rated health (SRH) has been used extensively to study health trends and inequalities between men and women, as well as across other population groups (Benyamini and Idler, 1999; DeSalvo et al., 2006; Idler and Benyamini, 1997). SRH is a single-question item that asks respondents to rate their own health, typically on a five-point scale ranging from “excellent” to “poor.” Key strengths of SRH are its high reliability (Lundberg and Manderbacka, 1996; Zajacova and Dowd, 2011) and criterion validity. The latter implies that SRH correlates highly with concurrent measures of health (Cousins, 1997; Gold et al., 1996; Jylha et al., 2006) and also predicts future health problems, health-care utilization, and mortality (Idler and Benyamini, 1997; Mossey and Shapiro, 1982).

Despite the widespread use of SRH to measure health, and the growing literature examining its measurement properties, we know surprisingly little about how individuals form their health judgment. SRH is a *social* construct (Kaplan et al., 1976) generated by a complex subjective cognitive-emotional process, grounded in context and culture (Jylhä, 2009). The foundation of SRH is the respondents' physiological state and their knowledge of this state, but a multitude of other inputs and influences—such as health expectations, peer comparisons, personality characteristics—likely

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play a role. The basic components of SRH include the presence or absence of illnesses and medical conditions, health behaviors, and disabilities or limitations in physical functioning (Jylhä, 2009; Krause and Jay, 1994; Manderbacka, 1998; Peersman et al., 2012; Undén and Elofsson, 2006). Other health-related correlates of SRH include symptoms such as pain (Malmusi et al., 2012) and psychological well-being (Han et al., 1999). The health judgment is also influenced by socio-economic factors, especially respondents' level of education (Idler et al., 1999; Krause and Jay, 1994).

The evaluative process and the specific frames of reference used to form the SRH judgment differ across individuals (Krause and Jay, 1994). These differences can be problematic if they occur systematically across groups because they could bias our understanding of health inequalities across those groups. It is therefore critical that we better understand how respondents from different population groups form their SRH judgment.

Most prior studies that aimed to understand group differences in the SRH judgment studied its predictive validity, specifically, how well SRH correlates with subsequent mortality. Generally SRH predicts mortality better among respondents of higher socioeconomic status (Dowd and Zajacova, 2007; Fiscella and Franks, 1997), non-Hispanic white adults compared to racial and ethnic minority members (Woo and Zajacova, 2016), in more recent birth cohorts (Schnittker, 2005), and younger respondents (Zajacova and Woo, 2016). With respect to gender, the predictive validity of SRH is most often found to be higher for men than women in studies from around the world (Benjamins et al., 2004; Benyamini and Idler, 1999; Deeg and Kriegsman, 2003; Hu et al., 2016; Idler and Benyamini, 1997; Nishi et al., 2012; Spiers et al., 2003) although some studies found no significant difference in SRH-mortality associations between men and women (Bath, 2003; Singh-Manoux et al., 2007). An exception is a finding among older Israeli respondents of a slightly higher predictive validity for women (Benyamini et al., 2003).

However, anchoring SRH in mortality to explore gender differences in the meaning or structure of SRH is problematic given the long-recognized gender paradox (Nathanson, 1975): gender patterns in mortality are different from patterns in morbidity. Women tend to have worse health but live longer than men (Verbrugge, 1985, 1989). Trying to understand gender patterns in *health* judgment by anchoring it in *mortality* may therefore fail to uncover meaningful gender differences. In fact, one explanation for the gender paradox is that women and men may differ in evaluating and reporting their health (Idler, 2003).

Therefore, we need to more directly study the meaning and structure of the SRH in men and women: how do physical health, mental health, health behaviors, and other factors contribute to the overall health judgment? We present a comprehensive gender comparison of the structure of the health judgment in a large, nationally-representative sample of US adults across the adult life span. We contribute to the literature in several ways.

First, we include many health measures ranging from health conditions, depressive symptoms, pain, functioning, health behaviors, and health care utilization. This range is important because individuals use many different inputs in their health judgments (Krause and Jay, 1994). More specific to the gender comparisons, men and women are sometimes thought to place different weights on particular inputs when making their health judgment. Women may be more inclusive, taking into account mild symptoms and chronic conditions as compared to men who focus on serious and life-threatening conditions (Benyamini et al., 2000). Men were found to use physical functioning as well as health behaviors to a greater degree in their health judgment than women (Peersman et al., 2012). Health behaviors are of particular importance as they may play a central role in gender differences in health (Rieker et al., 2010). While studying the health inputs and their relationships with SRH, we also consider the role of social factors. The social dimension is relevant because differential access to health-related resources due to women's lower social status is considered a key reason for gender health disparities (Read and Gorman, 2010). Moreover, social and physiological inputs may interact in complex ways to produce the health judgment (Rieker and Bird, 2005; Vlassoff, 2007). Empirically, a prior study found a wide range of health and social inputs relevant for SRH among Swedish adults, with no meaningful gender differences in how the inputs predicted men's and women's health judgments (Undén and Elofsson, 2006).

Second, we describe patterns in SRH across the adult life span. Examining a wide age range is important because the gender patterns in SRH may depend on the life stage (Read and Gorman, 2010), as do patterns in many health conditions. For instance, cardiovascular diseases (CVD) are more prevalent among men than women at younger ages but this difference disappears among older adults (Rieker et al., 2010). Several studies also suggested that women's health ratings may be worse than men's during earlier stages of adulthood (Ross and Bird, 1994) but this gender difference may attenuate or even disappear at older ages (Gorman and Read, 2006; Verbrugge, 1985). There are also indications that the health conditions most important for forming the health judgment change across age, regardless of gender (Krause and Jay, 1994; Read and Gorman, 2011). We therefore include adults aged 25–84 and examine gender differences separately among young, middle-aged, and older adults.

Finally, we address the possibility that the health judgment may not operate as a smooth linear continuum for men and women: factors that predict excellent or very good SRH may not be the same factors that lead individuals to report poor health (Jylhä, 2009; Kaplan and Barol-Epel, 2003). Yet typical frequentist analyses model only the central tendencies and thus may obscure potential gender differences at the tails of the SRH distribution. We thus conclude our analysis with a proof-of-concept Bayesian approach to exploring gender differences with respect to one health measure –mental health– at specific SRH levels.

2. Data and methods

2.1. Data

We used data from the 2002–2015 National Health Interview Survey (NHIS). NHIS is an ongoing annual cross-sectional survey representative of the civilian non-institutionalized population of the United States (National Center for Health Statistics, 2016). In-person interviews are conducted by U.S. Census interviewers in about 35,000 households every year. The purpose of the NHIS is to monitor the levels, trends, and correlates of health and disability in the American population. We accessed the data via the harmonized Integrated Health Interview Survey version (Minnesota Population Center and State Health Access Data Assistance Center, 2016).

Sample. In the NHIS sampling frame, a random subsample of one adult per household ("sample adult") was asked detailed health questions. Our analytic sample consists of US-born respondents age 25–84 who were asked these detailed health questions in 2002–2015 interviews. We included only US-born adults to minimize potential confounding due to language or cultural issues (Bzostek et al., 2007). The NHIS interview range 2002–2015 was selected because 2002 is the first year when question about arthritis, a potentially-salient highly prevalent condition, was asked