



Perceived interpersonal and institutional discrimination among persons with disability in the U.S.: Do patterns differ by age?

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ABSTRACT

Rationale: One-third of U.S. adults have an activity-limiting health condition and this proportion increases with age. However, it is unclear whether functional limitation renders one vulnerable to institutional and interpersonal discrimination, and whether this vulnerability differs over the life course. Stigma theories suggest disability would be more discrediting to younger persons relative to older adults, as it violates cultural norms and expectations regarding able-bodied working-age adults.

Objective: We evaluate whether U.S. adults with functional impairment report higher levels of perceived interpersonal mistreatment and institutional discrimination relative to persons without impairment, and whether these patterns differ across age groups.

Method: We use data from the second wave of the National Survey of Midlife Development in the United States (MIDUS II), collected between 2004 and 2006 ($n = 3931$). We estimate OLS and logistic regression models to predict interpersonal and institutional discrimination, respectively.

Results: Persons with impairment report more frequent encounters of disrespectful treatment, insults, and being treated as if they have a character flaw, and elevated odds of workplace- and service-related discrimination, net of sociodemographic, and physical and mental health characteristics. Effects are significantly larger among early (age 40–49) and late (age 50–64) midlife versus older (age 65+) adults.

Conclusions: We discuss implications for policy and practice, and underscore that stigmatization processes may further amplify health and socioeconomic disparities between those with versus without functional limitations.

1. Introduction

The consequences of interpersonal and institutional discrimination for physical and mental health are widely documented (Krieger, 2014; Pascoe and Smart Richman, 2009). Extensive research demonstrates the toll that racism (Williams and Williams-Morris, 2000), sexism (Pavalko et al., 2003), sizeism (Carr and Friedman, 2005), ageism (Vogt Yuan, 2007), and microaggressions (Sue et al., 2007) take on mental health symptoms such as depression, and physical health problems including hypertension, diabetes, and chronic pain (Brown et al., 2018). Although the effects of perceived discrimination on well-being are well documented, we know of no population-based studies exploring whether common physical health limitations, including difficulty performing daily activities like walking or lifting, render one vulnerable to demoralizing or discriminatory treatment. Research conducted primarily in the U.S., Canada, and Europe reveals that persons with serious mental illness (Russinova et al., 2011; Thornicroft et al., 2009) and

“visible” physical health conditions like hearing-aid use (Erler and Garstecki, 2002) and epilepsy (Kilinc and Campbell, 2009) are particularly vulnerable to interpersonal mistreatment and workplace discrimination, with the latter detected across diverse industries including construction (Ormerod and Newton, 2013), nursing (Davidson et al., 2016), and finance and professional services (Ameri et al., 2018).

Understanding experiences of persons with more common impairments also is an important goal. About 15 percent of middle-aged adults in the U.S. have some difficulty performing basic daily activities and this proportion rises steadily with age, reaching 30 percent among persons ages 65 and older (Brown et al., 2017; Federal Interagency Forum on Aging-Related Statistics, 2016). Comparable patterns are detected in other high- and middle-income nations, with rates of moderate limitation among older adults ranging from 10 percent in western European nations like Belgium, to more than one-third in eastern European nations such as Slovakia (Eurostat, 2018). Stressful or demeaning personal encounters may intensify the negative health

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consequences of one's underlying physical conditions (Tomiyama et al., 2018).

We use data from the second wave of the National Survey of Midlife Development in the United States (MIDUS II, 2004–06) to explore: (1) whether persons in the U.S. with difficulty performing daily activities are at a heightened risk of reporting interpersonal and institutional discrimination; (2) the extent to which these associations persist net of demographic, socioeconomic, and physical and mental health factors associated with both impairment and perceived mistreatment; and (3) the extent to which associations between impairment and perceived discrimination vary over the life course. We focus on three types of interpersonal mistreatment (treated disrespectfully, treated as if one has a character flaw, and insulted/harassed), and two types of lifetime institutional discrimination (workplace and treatment by service providers).

2. Functional limitation and perceived discrimination

Early writings on stigma theorized that persons with impairment may be devalued by others. Goffman (1963) defined stigma as any personal attribute that is “deeply discrediting” to its possessors; these attributes include “tribal stigmata,” “abominations of the body,” and “blemishes of individual character.” Persons with functional limitations arguably fall into the latter two categories. Goffman's writings suggested that persons with disabilities, whether physical or mental, visible or invisible, are “disqualified from full social acceptance” (p. 3) both because their condition is unappealing to others and is a signal that a person may not be fully capable of carrying out expected social roles. Especially in western capitalist societies where being able-bodied is viewed as a marker of competence, vigor, and capacity to work, persons with limitations also may be viewed as possessing a “blemish of individual character” - a malingerer who is faking or exaggerating their symptoms to evade work and other responsibilities (Lingsom, 2008). Contemporary conceptualizations of the stigma process elaborate that this devaluation is manifested in the actions of social institutions and individuals who denigrate and exclude. This mistreatment may encompass institutional discrimination which blocks access to education, employment, and healthcare, and daily interpersonal slights that may undermine one's emotional and physical well-being (Link and Phelan, 2001). Importantly, stigmatization may undermine one's life chances through processes of discrimination.

Understanding discrimination experienced by persons with impairment is an important public health concern (Krahn et al., 2015). An estimated 90 million American adults and 1 billion persons worldwide currently report difficulty with seeing, hearing, mobility, communication, cognition, or self-care (Groce, 2018; National Center for Health Statistics, 2017). Rates of impairment among young and midlife adults in the U.S., especially those of lower socioeconomic status, have risen dramatically in recent years, alongside population aging and a corresponding increase in physical limitation (Brown et al., 2017; Joffe-Walt, 2013). While early writings suggested that early-onset impairments were short-lived (Ferrucci et al., 1998), recent assessments show that functional limitations among working-age adults follow trajectories similar to those of older persons (Brown, 2015). Yet, we know of no population-based studies in the United States or elsewhere exploring whether functional limitations render one vulnerable to diverse types of discrimination, whether these patterns vary over the life course, and whether documented associations persist net of socioeconomic, demographic, and health characteristics implicated in both discrimination and disability risk.

Discrimination against persons with functional limitations is prohibited by law in the United States. The Americans with Disability Act (ADA), passed by Congress in 1990 and amended in 2008, prohibits discrimination on the basis of disability in employment, public services (e.g., transportation), public accommodations, and telecommunications. The ADA also (a) requires employers to provide reasonable

accommodations to qualified individuals with a disability; and (b) is based on an expansive definition of “disability” and encompasses both mental and physical conditions; a condition needs not be severe or permanent to qualify an individual for accommodations (Jasper, 2008). Despite these protections, media reports and legal cases of persons being mistreated or stigmatized on the basis of health problems, even relatively minor ones such as back problems, controlled diabetes, or a speech impediment, are common (McMahon and Shaw, 2005). Workers with activity limitations in the United States and United Kingdom earn less, receive less training and benefits, are less likely to participate in decision-making, and are more likely to exit employment, relative to their counterparts without such conditions (Rigg, 2005; Schur et al., 2009). Institutional discrimination extends beyond the workplace and into health care settings; health care consumers with poorer self-rated health are more likely to report receiving inferior services, compared to consumers in better health (LaVeist et al., 2003).

Still, institutional discrimination represents a small proportion of all stigmatizing encounters. Other subtle yet pernicious forms of stigmatization including interpersonal slights and denigration may undermine well-being, especially for those whose health and functioning are already compromised (Link and Phelan, 2001). Focus group interviews with persons with sensory or physical limitations reveal that micro-aggressions are common, including being treated like “second-class citizens,” and having one's intelligence, skills, and talents underestimated (Keller and Galgay, 2010, pp. 249-50). Quantitative studies in the United Kingdom similarly show that workers with physical and psychological disabilities are more likely to report excessive criticism of their work performance, bullying, and disrespectful treatment, relative to workers without impairment (Fevre et al., 2013).

Little is known about linkages between physical disability and diverse types of both institutional and interpersonal discrimination in the overall U.S. population. Most studies focus on small samples of persons with relatively low-prevalence or visible health conditions such as psychiatric conditions (Kassam et al., 2012), hearing-aid use (Erler and Garstecki, 2002), HIV/AIDS (Fife and Wright, 2000), or epilepsy (Jacoby, 1994); rely on regional samples (Kilpatrick and Taylor, 2018); or focus on persons with impairment only, thus preventing rigorous comparisons between those with versus without an activity limiting condition (Brown, 2015). We use data from a nationally representative sample of U.S. adults to explore whether persons with difficulty performing daily activities are at a heightened risk of reporting interpersonal and institutional discrimination. Drawing on stigma theories, we separately examine three subtypes of interpersonal mistreatment (disrespectful treatment, being treated as if one has a character flaw, and harassment/insults) and two types of lifetime institutional discrimination (workplace and treatment by service providers) to identify the specific ways that persons with impairment experience the stigmatization process.

2.1. Life course differences in the disability-discrimination link

Our second aim is to evaluate the extent to which the association between disability and perceived discrimination varies over the life course. Disablement diminishes individuals' “abilities to act in necessary, usual, [and] expected ... ways in their society” (Verbrugge and Jette, 1994: 3). Thus, impairment may be more discrediting to younger persons, as it violates expectations regarding physically and economically active and independent “able-bodied” young adults (McPherson, 1994). Because functional impairment is less common in young (age 30–39) and middle (age 40–64) adulthood relative to old age (age 65+), it may be a more salient personal characteristic that elicits stigmatizing treatment from others (Barreto and Ellemers, 2015).

Structural factors also may contribute to greater stigmatization in earlier versus later life. The size and diversity of one's social networks and life spaces diminish with age, such that younger persons interact in a wider array of social settings and with a more extensive network of

persons who may be the source of stigmatization (Baker et al., 2003). By contrast, older adults' social networks diminish, especially upon retirement, such that they tend to interact with a smaller and more close-knit group of friends, relatives, and confidantes (Carstensen, 1992); this more selective group may be less inclined to mistreat an older adult with impairment. Older adults with impairment may be treated with support and empathy, whereas their younger counterparts may be treated with disdain or disrespect, as they are violating the cultural norm of able-bodiedness (Menec and Perry, 1995). Thus, we contrast the disability-discrimination link among persons in young adulthood (age 30–39), early (age 40–49) and late (age 50–64) midlife, and later life (age 65+); we expect that the link between disability and perceived discrimination will be more pronounced among working-age adults relative to persons age 65+ because impairment is more common, accepted, and expected in later life (Borawski et al., 1996; Brown, 2015; Erler and Garstecki, 2002).

2.2. Other influences on disability and perceived discrimination

Our final aim is to evaluate the extent to which the disability-discrimination link persists after established confounds are adjusted. An association between functional limitation and perceived discrimination may be spurious, reflecting the fact that persons from socially and economically disadvantaged groups, including women, ethnic minorities, persons of lower socioeconomic status, and persons with health conditions including mental illness, obesity, and other diseases are especially vulnerable to both (Brown et al., 2017; Kessler et al., 1999). Failure to control for potential confounds (or suppressors) may lead to an overestimation (or under-estimation) of the association between impairment and perceived discrimination. Analyses are adjusted for demographic and socioeconomic characteristics including sex, race, marital status, education, occupation, and employment status, which are correlated with both physical disability (Brown et al., 2017; Krahn et al., 2015; Wong et al., 2015) and perceived discrimination (Carr et al., 2008; Kessler et al., 1999). We also adjust for body mass index (BMI), and physical and mental illness diagnoses as they are associated with elevated risk of disability (Kassam et al., 2012; Krahn et al., 2015) and perceived discrimination (Carr and Friedman, 2005; Kessler et al., 1999). Finally, we adjust for negative affect which is a consequence of disablement and may render one particularly sensitive to unpleasant encounters such as interpersonal mistreatment (Carr et al., 2008).

3. Method

3.1. Data

Analyses are based on data from the second wave of the National Survey of Midlife Development in the United States (MIDUS II) conducted between 2004 and 2006. MIDUS is a national longitudinal study initiated in 1995 to better understand connections between psychosocial factors and health among more than 7000 noninstitutionalized adults aged 25 to 74. Retention rates at the second wave were higher among women, whites, married people, and people with more education and better health, with a 75% overall participation rate adjusted for mortality (Radler and Ryff, 2010). We use data from the second wave only. The first wave (MIDUS I) was collected 10 years earlier, thus a prospective exploration of disability status at one wave and perceived discrimination at a subsequent wave would raise significant concerns, given the instability of impairment over such a long period (Lin and Kelley-Moore, 2017). A third wave, collected in 2013–15, is available and would enable us to explore more recent patterns; yet, roughly 27% of the MIDUS II participants had attrited by MIDUS III, with this proportion significantly higher among those with versus without impairment in wave 2 (33 vs. 23 percent). Additionally, no MIDUS III participants are under age 40, weakening our capacity to explore life course differences in impairment-related discrimination. A refresher cohort,

comprising younger adults, is available yet only a single wave of data has been collected thus far.

MIDUS II comprises 4041 respondents who completed a telephone interview and self-administered questionnaire. Our analytic sample is limited to persons with valid responses on the disability measure ($n = 3931$). Missingness in our analytic sample was less than 3% across all variables, except for lifetime workplace (7.4 percent) and service (7.8 percent) discrimination, and body mass index (5.4 percent). We used multiple imputation by chained equations (MICE) to impute missing data for all independent and control variables (Royston, 2004; Rubin, 1987); multivariate results are based on the imputed data.

3.2. Measures

3.2.1. Dependent variables

We consider two aspects of perceived discrimination: daily interpersonal mistreatment and lifetime institutional discrimination, using a widely used and validated set of items (Kessler et al., 1999; Williams et al., 1997). Daily interpersonal mistreatment was assessed with the question “How often on a day-to-day basis do you experience each of the following [nine] types of discriminations?” Response categories were never, rarely, sometimes, and often. We conducted factor analyses and constructed three conceptually and statistically distinct subscales to evaluate nuanced differences in the subtypes of perceived interpersonal discrimination reported (see Carr et al., 2008). *Lack of respect* ($\alpha = 0.91$) indicates the frequency with which one was: treated with less courtesy than other people; treated with less respect than other people; received poorer service than other people at restaurants or stores; treated as if not smart; and treated as if not as good as other people. *Blemish of character* ($\alpha = 0.72$) refers to the frequency with which one is: treated as if they are dishonest; and treated as if they are frightening to others. *Insulted/harassed* ($\alpha = 0.82$) refers to the frequency with which one is: called names or insulted; and threatened or harassed. Responses were averaged; scores ranged from 1 to 4, where 4 reflects more frequent perceived mistreatment.

Lifetime institutional discrimination was assessed with the question “How many times in your life have you been discriminated against because of race, ethnicity, gender, age, religion, physical appearance, sexual orientation, or other characteristics in each of the following ways?” *Workplace discrimination* includes: not hired for a job, not given a job promotion, and fired due to a personal characteristic. *Service discrimination* includes being denied a bank loan, denied or provided inferior medical care, and denied or provided inferior service by a plumber, car mechanic, or other service providers due to one's personal characteristics. We constructed a dichotomous variable indicating that one has ever experienced each subtype of institutional mistreatment, consistent with prior studies (Mays and Cochran, 2001).

3.2.2. Focal independent variable

Physical disability is conceptualized as the presence of functional limitations, assessed in the self-administered questionnaire with items adapted from the SF-36, capturing difficulty with nine activities of daily living (Ware and Sherbourne, 1992). Participants are asked, “How much does your health limit you in doing each of the following: lifting or carrying groceries; bathing or dressing yourself; climbing several flights of stairs; bending, kneeling, or stooping; walking more than a mile; walking several blocks; walking one block; vigorous activity (e.g. running, lifting heavy objects); moderate activity (e.g. bowling, vacuuming)?” Original responses included not at all, a little, some, and a lot. We classify participants as having a limitation if they reported at least “some” difficulty on any of the nine items, consistent with previous MIDUS analyses (Friedman, 2016). We conducted sensitivity analyses in which we classified persons as having a disability if they indicated “a lot” on any of the nine difficulty items, consistent with studies using surveys other than MIDUS (Wong et al., 2015). Results were generally similar regardless of the measure used, so we used the

Table 1
Descriptive statistics, total sample and by disability status, MIDUS II, 2004-06.

Variable	Total <i>M (SD), %</i>	No disability <i>M (SD), %</i>	Any disability <i>M (SD), %</i>	Group difference
<i>Sociodemographic characteristics</i>				
<i>Age group</i>				
Young adulthood (age 30–39)	7.5	11.3	3.6	$p < .001$
Early midlife (age 40–49)	23.5	31.3	15.5	
Late midlife (age 50–64)	39.6	40.4	38.7	
Later life (age 65 or older)	29.4	16.9	42.2	
Gender (1 = female)	55.2	50.4	60.1	$p < .001$
Race/ethnicity (1 = minority)	8.5	8.9	8.1	$p = .319$
Marital status (1 = currently married)	71.3	76.2	66.1	$p < .001$
<i>Education</i>				
< high school graduate	7.2	4.4	10.1	$p < .001$
High school graduate	25.6	21.5	29.8	
Some college	28.7	28.3	29.0	
> college graduate	38.6	45.9	31.0	
<i>Current (or most recent) occupation</i>				
Upper white-collar	41.8	45.9	37.5	$p < .001$
Lower white-collar	36.0	32.4	39.7	
Blue-collar/farm/military	22.3	21.7	22.8	
Working status (1 = currently working)	63.1	76.2	49.6	$p < .001$
<i>Body Mass Index</i>				
Underweight (< 18.5 kg/m ²)	1.1	1.2	1.0	$p < .001$
Normal (18.5–24.9 kg/m ²)	31.1	36.9	25.1	
Overweight (25.0–29.9 kg/m ²)	39.5	41.9	37.0	
Obese (30 or greater kg/m ²)	28.2	19.9	36.8	
Any physical condition (1 = yes)	75.4	63.1	88.0	$p < .001$
Clinical mental disorders (1 = yes)	16.2	12.2	20.3	$p < .001$
Negative affect (1–5)	1.51 (0.58)	1.39 (0.46)	1.64 (0.66)	$p < .001$
<i>Perceived discrimination</i>				
Lack of respect, daily (1–4)	1.53 (0.60)	1.48 (0.57)	1.59 (0.62)	$p < .001$
Blemish of character, daily (1–4)	1.32 (0.52)	1.29 (0.50)	1.34 (0.54)	$p < .01$
Harassment, daily (1–4)	1.24 (0.47)	1.22 (0.44)	1.26 (0.49)	$p < .01$
Ever experienced workplace discrimination (1 = yes) ^a	28.1	24.7	31.7	$p < .001$
Ever experienced service discrimination (1 = yes)	15.4	12.9	18.2	$p < .01$
<i>n</i>	3931	1992	1939	
Percent (%)	100	50.7	49.3	

Notes: Descriptive statistics are based on unimputed data. Proportions are presented for categorical measures and means (standard deviations) are presented for continuous measures. For dichotomous variables, presented are proportions of the sample in the category coded as “1”.

^a Results were highly comparable whether the question was applied to all respondents ($n = 3639$) or those who have ever worked for a paid job at least 6 months ($n = 3502$).

less restrictive measure because it is more appropriate for capturing disablement among younger and midlife adults, for whom rates and severity are more modest (Brown et al., 2017). The most common limitation reported among persons with impairment was vigorous activity (90 percent), followed by walking a mile and kneeling, bending or stooping (48 percent, respectively).

3.2.3. Moderating variable

To test whether the association between physical disability and perceived discrimination differs over the life course, we recoded age into the categories of: young adulthood (ages 30–39), early midlife (ages 40–49), late midlife (ages 50–64), and later life (age 65 or older), consistent with earlier empirical studies of impairment over the life course (Wilkinson et al., 2018).

3.2.4. Control variables

All analyses are adjusted for demographic and socioeconomic characteristics including gender (1 = female; 0 = male), race/ethnicity (1 = racial or ethnic minority; 0 = non-Hispanic white), marital status (1 = currently married; 0 = unmarried), education (less than high school, high school graduate (reference group), some college, college graduate or higher), employment status (1 = currently working; 0 = not working), and current or most recent occupation. We recoded the specific three-digit Census occupational codes into three broad categories of upper white-collar (professional, executive, and managerial occupations), lower white-collar (sales and clerical occupations), and

blue-collar (crafts, operatives, labor, farm, and military) occupations (Carr et al., 2008).

We included four dimensions of physical and mental health. Body mass index (BMI) was calculated based on self-reported height and weight, and scores were recoded into four categories based on National Heart, Lung, and Blood Institute guidelines (underweight, normal (reference group), overweight, obese). Presence of a serious physical health condition (1 = yes; 0 = no) refers to whether one has experienced or been treated for any of 27 medical conditions in the past 12 months (i.e., physical conditions such as asthma or joint problems; oral health diseases such as persistent teeth trouble; and neurological disorders).

Presence of a clinically significant mental health disorder (1 = yes; 0 = no) refers to whether one was diagnosed with any of five conditions (major depression, generalized anxiety disorder, panic disorder, and alcohol and drug dependence) in the year prior to interview (Kessler et al., 1999; Mays and Cochran, 2001). Major depression, anxiety, and panic disorders were assessed during the phone interview with items from the Composite International Diagnostic Interview (CIDI) Short Form, based on criteria specified in the American Psychiatric Association's (APA) Diagnostic and Statistical Manual of Mental Disorders, third edition-revised (DSM-III-R; 1987). Alcohol and drug dependence assessments were based on DSM-IV criteria (1994).

Negative affect ($\alpha = 0.87$) is measured with a subset of items from the Positive-Negative Affect Scale (PANAS): “During the past 30 days, how much of the time did you feel: (a) so sad nothing could cheer you

Table 2
OLS regression model predicting daily interpersonal mistreatment, MIDUS II, 2004-06.

	Model 1	Model 2	Model 3	Model 4	Model 5
Lack of Respect Subscale (n = 3865)					
Physical disability ^a	0.12 (0.02)***	0.18 (0.02)***	0.17 (0.02)***	0.14 (0.02)***	0.08 (0.02)***
Age group ^b					
Young adulthood		0.32 (0.04)***	0.32 (0.04)***	0.32 (0.04)***	0.21 (0.04)***
Early midlife		0.30 (0.03)***	0.30 (0.03)***	0.30 (0.03)***	0.20 (0.03)***
Late midlife		0.20 (0.02)***	0.20 (0.02)***	0.19 (0.03)***	0.13 (0.02)***
Constant	1.48 (0.01)***	1.30 (0.03)***	1.24 (0.03)***	1.14 (0.04)***	0.90 (0.04)***
Mean adjusted R ²	0.01	0.09	0.10	0.10	0.15
Blemish of Character Subscale (n = 3860)					
Physical disability ^a	0.05 (0.02)**	0.11 (0.02)***	0.10 (0.02)***	0.08 (0.02)***	0.05 (0.02)**
Age group ^b					
Young adulthood		0.25 (0.03)***	0.25 (0.04)***	0.25 (0.04)***	0.19 (0.04)***
Early midlife		0.22 (0.02)***	0.21 (0.03)***	0.21 (0.03)***	0.15 (0.03)***
Late midlife		0.12 (0.02)***	0.12 (0.02)***	0.11 (0.02)***	0.08 (0.02)***
Constant	1.29 (0.01)***	1.24 (0.03)***	1.19 (0.03)***	1.13 (0.03)***	1.00 (0.04)***
Mean adjusted R ²	0.00	0.08	0.08	0.09	0.11
Harassment Subscale (n = 3877)					
Physical disability ^a	0.04 (0.01)**	0.09 (0.02)***	0.09 (0.02)***	0.07 (0.02)***	0.03 (0.02)*
Age group ^b					
Young adulthood		0.24 (0.03)***	0.24 (0.03)***	0.24 (0.03)***	0.18 (0.03)***
Early midlife		0.19 (0.02)***	0.19 (0.02)***	0.18 (0.02)***	0.13 (0.02)***
Late midlife		0.13 (0.02)***	0.13 (0.02)***	0.12 (0.02)***	0.09 (0.02)***
Constant	1.22 (0.01)***	1.19 (0.02)***	1.16 (0.03)***	1.10 (0.03)***	0.95 (0.03)***
Mean adjusted R ²	0.00	0.05	0.05	0.05	0.09

Notes. Unstandardized coefficients and standard errors are presented; statistical significance is denoted as * $p < .05$, ** $p < .01$, *** $p < .001$. Results are based on 20 imputations. Age groups are young adulthood (30–39); early midlife (40–49); late midlife (50–64); and later life (age 65+). Model 1 includes disability status only; Model 2 incorporates race, gender, marital status; Models 3 additionally controls for education, employment status, and current or most recent occupation; Models 4 further adjust for BMI and any physical condition; and Models 5 additionally controlled for clinical mental disorder and negative affect.

^a Reference group is persons without disability.

^b Reference group is Age 65+.

up; (b) nervous; (c) restless or fidgety; (d) hopeless; (e) that everything was an effort; and (f) worthless.” Responses ranged from 1 (none) to 5 (all the time) and are averaged such that higher scores reflect more frequent negative affect (Kessler et al., 1999).

3.3. Analytic plan

We first conducted bivariate analyses comparing perceived interpersonal mistreatment and lifetime discrimination, as well as demographic, socioeconomic, and health characteristics by disability group; we conducted *t*-tests for continuous measures and chi-square tests for categorical variables. Second, we estimated ordinary least squares (OLS) regression models to assess the extent to which functional limitation is associated with perceived interpersonal mistreatment, and logistic regression models for the binary outcomes of work- and service-related discrimination. We used hierarchical regression to evaluate the extent to which a documented effect of disability is accounted for by each block of covariates. Model 1 presents unadjusted associations between disability and perceived discrimination. Model 2 incorporates demographic characteristics (i.e., age, sex, race, marital status), Model 3 further includes socioeconomic characteristics (i.e., education, work, occupation), Model 4 adds in BMI and presence of a medical condition, and Model 5 incorporates two mental health indicators (i.e., any clinical diagnosis, negative affect). Finally, we tested a two-way interaction term of disability by age group, to evaluate whether the linkage between physical disability and perceived discrimination varies across the life stages, net of covariates. Analyses were conducted using STATA 15.0.

4. Results

4.1. Bivariate analysis

Table 1 shows that half of the analytic sample reported at least some functional impairment, with a steep gradient by age. Over 40 percent of

adults with disabilities were 65 or older, while this age group accounted for just 17 percent for adults without disabilities. A socioeconomic gradient also is evident, such that 10 percent of persons with impairment have less than a high school diploma, compared to just 4.4 percent of adults without impairment. Adults with impairment are less likely to be employed and are under-represented among upper white-collar workers, relative to those without disabilities. Disability is linked to body weight; 36 percent of persons with disabilities but just 20 percent of nondisabled persons are classified as obese. They also are more likely to report experiencing a medical condition in the past 12 months, relative to their counterparts without impairment (88 vs. 63 percent). Supplemental analyses revealed that persons with impairment are more likely to report 25 of the 27 specific conditions encompassed in the aggregated measure, except AIDS/HIV infection and hay fever. Persons with impairment also are more likely to report a clinical mental disorder (20.3 vs. 12.2 percent), and have significantly higher levels of negative affect ($M = 1.64$ vs. 1.39).

Persons with disabilities report significantly more frequent encounters of disrespect ($M = 1.59$ vs. 1.48, $p < .001$), being treated as if they had a character flaw ($M = 1.34$ vs. 1.29, $p < .01$), and insults/harassment ($M = 1.26$ vs. 1.22, $p < .01$). They also are more likely to report experiences of workplace discrimination (31.7 vs. 24.7 percent, $p < .001$) and service-related discrimination (18.2 vs. 12.9 percent, $p < .001$). Supplemental analyses showed that persons with disabilities are more likely than those without disabilities to attribute their discriminatory experiences to a physical disability (3.7 vs. 0.5 percent, $p < .001$), although one out of four respondents does not offer an attribution for their mistreatment, regardless of impairment status (results available from authors).

4.2. Multivariate analysis

4.2.1. Physical disability and perceived discrimination

OLS regression models predicting three subtypes of interpersonal treatment are presented in Table 2; the top panel shows results for

Table 3
Logistic regression model predicting lifetime institutional discrimination, MIDUS II, 2004–06.

	Model 1	Model 2	Model 3	Model 4	Model 5
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Workplace Discrimination (n = 3639)					
Physical disability ^a	1.41*** (1.22, 1.63)	1.70*** (1.45, 1.99)	1.78*** (1.52, 2.09)	1.55*** (1.31, 1.84)	1.39*** (1.17, 1.65)
Age group ^b					
Young adulthood		2.21*** (1.63, 3.01)	2.14*** (1.55, 2.96)	2.16*** (1.55, 3.00)	1.65** (1.17, 2.33)
Early midlife		2.07*** (1.65, 2.58)	2.00*** (1.57, 2.56)	1.97*** (1.53, 2.52)	1.56*** (1.20, 2.02)
Late midlife		2.11*** (1.74, 2.56)	2.06*** (1.66, 2.55)	1.99*** (1.60, 2.47)	1.71*** (1.37, 2.14)
Service Discrimination (n = 3626)					
Physical disability ^a	1.50*** (1.25, 1.80)	1.73*** (1.42, 2.11)	1.81*** (1.48, 2.21)	1.55*** (1.26, 1.91)	1.39*** (1.12, 1.72)
Age group ^b					
Young adulthood		2.40*** (1.64, 3.50)	2.32*** (1.56, 3.45)	2.42*** (1.62, 3.62)	1.86** (1.23, 2.81)
Early midlife		2.41*** (1.82, 3.18)	2.34*** (1.73, 3.17)	2.36*** (1.74, 3.22)	1.88*** (1.37, 2.58)
Late midlife		1.91*** (1.49, 2.46)	1.87*** (1.43, 2.46)	1.83*** (1.39, 2.41)	1.57** (1.18, 2.07)

Notes. Odds Ratios (OR) and 95% confidence intervals (CI) are presented. Statistical significance is denoted as * $p < .05$, ** $p < .01$, *** $p < .001$. Results are based on 20 imputations. Age groups are young adulthood (30–39); early midlife (40–49); late midlife (50–64); and later life (age 65+). Model 1 includes disability status only; Model 2 incorporates race, gender, marital status; Models 3 additionally controls for education, employment status, and current or most recent occupation; Models 4 further adjusts for BMI and any physical condition; and Models 5 additionally controlled for clinical mental disorder and negative affect.

^a Reference group is persons without disability.

^b Reference group is Age 65+.

being treated with lack of respect, the center panel shows treatment as if one is of poor character, and the bottom is insults/harassment. We present coefficients for the focal predictors only, disability status and life course stage; each subsequent model incorporates an additional block of covariates as described above. Parallel logistic regression models for workplace discrimination (top panel) and service-related discrimination (bottom panel) are presented in Table 3 (Full models available from authors).

Persons with impairment report significantly higher levels of all three forms of interpersonal mistreatment relative to persons without disability, and these significant effects persist even after controlling for four blocks of covariates. The analyses also show clear evidence of suppression effects across all outcomes; the unadjusted effect of disability on mistreatment increases substantially in magnitude when demographic characteristics are added in Model 2. Similarly, the odds of reporting workplace discrimination and service-related discrimination increase by 21 and 16 percent respectively, when demographic characteristics are controlled for. This suppression reflects the fact that older persons are over-represented among those with impairment yet are less likely than their younger counterparts to report mistreatment.

The association between disability and perceived discrimination barely changes when SES indicators (Model 3) and body weight and physical health conditions (Model 4) are adjusted, although the mental health measures account for considerable attenuation (Model 5). The effect of disability declines by 10–20 percent across the five outcomes, after adjusting for body weight and physical health conditions in Model 4. After mental health is controlled in Model 5, the effect of disability remains statistically significant yet declines by roughly 10 percent for the two lifetime institutional discrimination outcomes and by 40–50 percent across the three interpersonal mistreatment outcomes. The fully adjusted models show that persons with impairment report significantly higher scores on lack of respect ($b = 0.08$, $p < .001$), blemish of character ($b = 0.05$, $p < .01$), and insults/harassment ($b = 0.03$, $p < .05$) relative to persons without impairment. Similarly, persons with impairment remain 1.4 times as likely as those without impairment to report lifetime workplace or service discrimination. In

supplemental analyses, we found comparable patterns for the specific outcome of inferior or denied medical care. Just 3.4 percent of the sample reported healthcare discrimination, yet the odds were 1.6 times higher ($p < .05$) among persons with impairment in the fully adjusted model.

4.2.2. Moderation analyses: are effects of disability contingent on age?

We tested two-way interaction terms of impairment by age group for each of the five outcomes and found evidence of statistically significant moderation for three outcomes: being treated disrespectfully ($F(1,3838.1) = 5.32$, $p = .021$), being insulted/harassed ($F(1,3819.4) = 4.33$, $p = .037$), and lifetime service-related discrimination ($F(1,70888.8) = 5.25$, $p = .022$), net of all covariates. These findings indicate that physical disablement renders one particularly susceptible to discrimination in early and late midlife, relative to old age. Although disablement is linked with perceived discrimination, the association is largest among persons in their 40s through mid-60s, and more modest and not statistically significant in young and older adulthood. For ease of presentation, we plot the statistically significant two-way interaction terms in Fig. 1 through 3, adjusted for all covariates.

Fig. 1 displays results for disrespectful treatment and shows that the disadvantage of persons with versus without disabilities is significantly larger among early ($b = 0.16$, $p < .001$) and late ($b = 0.09$, $p < .01$) midlife persons, and is modest among young and older adults. Similarly, Fig. 2 displays results for harassment/teasing; a significant difference is evident only during one's early midlife ($b = 0.08$, $p < .05$) and late midlife ($b = 0.06$, $p < .05$), as the predicted levels of self-reported harassment are highest in early midlife, followed by late midlife among persons with disabilities. Finally, Fig. 3 shows that persons with disability reveal consistently higher odds of reporting lifetime service discrimination relative to their counterparts without impairment. Differences are most pronounced in early midlife ($b = 0.14$, $p < .01$), followed by late midlife ($b = 0.06$, $p < .05$), but we did not detect comparable significant differences in young adulthood and older age for any of the three outcomes.

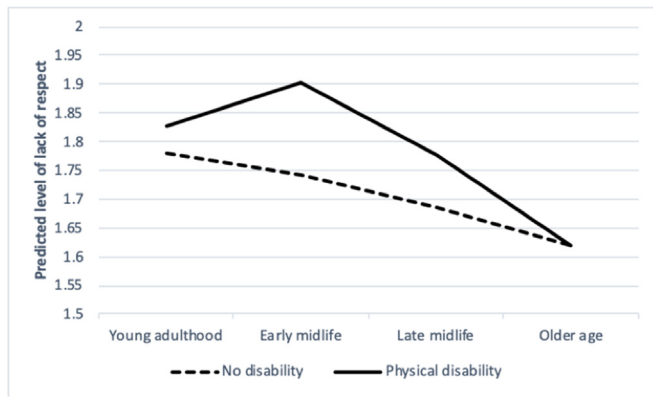


Fig. 1. Perceived levels of being treated with a lack of disrespect, by life course stage and disability status, MIDUS II, 2004–2006., *Note.* Results adjusted for all covariates. Age groups are young adulthood (30–39); early midlife (40–49); late midlife (50–64); and later life (age 65+). Statistically significant marginal differences by disability status were found in early midlife (0.16, $p < .001$) and late midlife (0.09, $p < .01$).

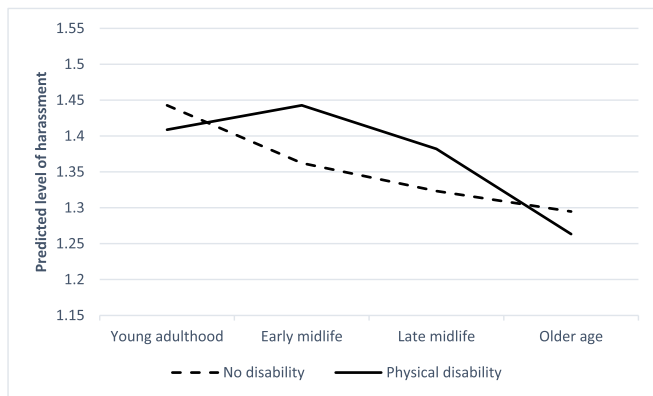


Fig. 2. Perceived levels of harassment, by life course stage and disability status, MIDUS II, 2004–2006., *Notes:* Results adjusted for all covariates. Age groups are young adulthood (30–39); early midlife (40–49); late midlife (50–64); and later life (age 65+). Statistically significant marginal differences by disability status were found in early midlife (0.08, $p < .05$) and late midlife (0.06, $p < .05$).

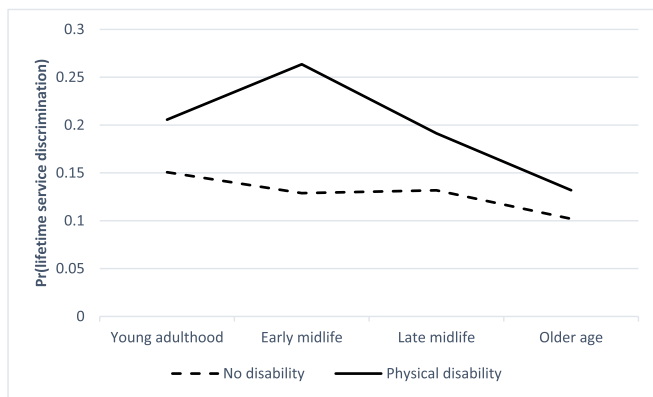


Fig. 3. Lifetime probability of self-reported service discrimination, by life course stage and disability status, MIDUS II, 2004–2006., *Note.* Results are adjusted for all covariates. Age groups are young adulthood (30–39); early midlife (40–49); late midlife (50–64); and later life (age 65+). Statistically significant marginal differences by disability status were found in early midlife (0.14, $p < .01$) and late midlife (0.06, $p < .05$).

5. Discussion

We examined whether functional impairment is linked with three types of perceived interpersonal mistreatment and two types of institutional discrimination, and explored life course differences in these linkages, using a large nationally representative sample of U.S. adults. We documented a clear association between functional limitation and five distinctive types of discrimination, and effects persisted after adjusting for risk factors including gender, race, socioeconomic status, body weight, physical health, mental health, and negative affect (see Tables 2 and 3). Supplemental analyses revealed similarly that persons with impairment also are especially vulnerable to discrimination in health care settings. These results are broadly consistent with stigmatization process models, which suggest that persons with devalued identities are vulnerable to institutional and interpersonal mistreatment (Link and Phelan, 2001).

For three outcomes (treated without respect, insulted/harassed, mistreated by service providers), effects of impairment are most pronounced in early (ages 40–49) and late (ages 50–64) midlife, relative to the retirement years (age 65+) (see Fig. 1 through 3). Impairment in early and later midlife is less statistically normative than in older age, and thus may be more salient to observers and judged more harshly by them. Age-related normative expectations hold that working-age adults should be physically and economically independent, although these expectations are relaxed for older adults who are approaching retirement or who have exited the labor force (Borawski et al., 1996; McPherson, 1994). The life spaces and daily activities one engages in vary widely over the life course, such that working-age persons are exposed to a larger and more diverse set of social environments and actors than their older counterparts who tend to prioritize close personal relationships and decrease the overall size of their social networks (Baker et al., 2003; Carstensen, 1992). Experiences of stigmatizing treatment by others may be more common among those who have more frequent, varied, or numerous encounters of any kind with coworkers, service providers, or other “consequential strangers” (Blau and Fingerman, 2009).

Counter to our expectations, the moderation analyses revealed only weak and nonsignificant effects of disablement on young adults’ experiences of discrimination. This may partly reflect weak statistical power, given that just 69 persons ages 30–39 reported impairment. It also may reflect the fact that young adults with impairment may have had such conditions since birth or childhood (Molton and Yorkston, 2017). Young persons with early-onset impairments might have learned early on how to adapt their activities and social encounters to meet their needs, limiting their exposure to distressing or discriminatory interpersonal and institutional encounters (King et al., 2010).

We did not find statistically significant moderation effects for two outcomes: treatment as if one had poor character and workplace discrimination. The former approached statistical significance, with the direction of associations similar to the other subtypes of discrimination ($p = .050$; not shown in Figures or Tables). It is unclear why we did not detect significant age differences in the link between impairment and workplace discrimination. The data do not allow us to pinpoint precisely when the lifetime work discrimination occurred; it is possible that the timing of such experiences was similar across age groups. Future studies, perhaps using open-ended interviews, could explore precisely how, when, and in what settings discrimination and mistreatment occur for adults at different life course stages.

Finally, consistent with previous research on obesity- and socio-economic status-related discrimination (Carr et al., 2008; Fuller-Rowell et al., 2018), mental health conditions account for considerable attenuation of the effects of disability on perceived discrimination. The effect of disability on interpersonal mistreatment declines by roughly 40–50 percent when mental health measures, especially negative affect, were controlled. This likely reflects the fact that persons with depressed affect are more susceptible to negative interpretation bias, or the

tendency to interpret ambiguous situations (such as interpersonal slights and microaggressions) negatively (Hindash and Amir, 2012). Disability-related depression or anxiety also may render one vulnerable to heightened mistreatment, as mental health conditions are themselves a stigmatized condition (Kassam et al., 2012; Sartorius, 2007). Future studies based on longitudinal data could better disentangle the complex causal linkage between affect and perceptions of mistreatment.

5.1. Limitations

Our analyses have several limitations. First, the stronger linkage between impairment and perceived mistreatment among midlife versus older persons may reflect cohort rather than age effects, such that members of the Baby Boom and Generation X cohorts are more sensitive to and aware of issues of discrimination, whereas older cohorts may be less cognizant of or willing to acknowledge structural inequalities and mistreatment. The youngest MIDUS participants, born in the 1970s and earlier, would have entered the labor market following the 1990 passage of the ADA. As such, they may have received more responsive accommodations, the benefit of school-to-work or work-based initiatives, and more thoughtful treatment in their work and social encounters in adulthood (Shandra and Hogan, 2008). Using a single cross-sectional wave of MIDUS data, we cannot definitively distinguish age versus cohort effects. We conducted supplementary exploratory analyses using the MIDUS I (1995) and MIDUS Refresher (2013) data, and found that persons with disability ages 65 + in all waves consistently reported lower levels of all forms of mistreatment than their younger counterparts, suggesting the importance of age (all results available from authors). Yet, we also found that older adults in the MIDUS Refresher sample (born pre-1949) reported consistently higher levels of mistreatment than older adults in MIDUS I (born pre-1931) and MIDUS II (born pre-1941), suggesting cohort differences in experiences. In future studies, we will explore more fully how age and cohort shape experiences and perceptions of mistreatment for persons with versus without impairment.

Second, we used a broad self-reported measure of impairment, but self-reported function is widely considered an important patient-centered measure (Brown et al., 2017) that is a robust predictor of subsequent adverse health outcomes including nursing home admissions (Gaugler et al., 2007) and mortality risk (Carey et al., 2004). Third, the MIDUS relies on perceptions rather than formally documented or confirmed reports of mistreatment. Nonetheless, perceptions are important in their own right and may have important consequences for the perceiver's health and well-being (Thomas and Znaniecki, 1958).

Fourth, MIDUS does not obtain detailed information on physical impairment, limiting our capacity to explore how experiences of discrimination may vary based on the specific activity-limiting health condition. To partially address this limitation, we examined whether persons with versus without impairment differed with respect to the medical conditions experienced over the prior 12 months. Persons with disability reported higher rates of 25 of the 27 conditions considered. Further, the effect of disability on perceived discrimination barely changed in magnitude or significance when physical health conditions were adjusted. Thus, our results suggest that it is the manifestation of one's conditions, such as difficulty walking or lifting, that elicits mistreatment from others rather than the underlying conditions. Future studies could further distinguish the presence of "visible" versus "invisible" health conditions, as the former may intensify the effects of disability on one's vulnerability to discriminatory treatment.

Fifth, our measure of institutional discrimination is a lifetime measure, and may refer to experiences that occurred years earlier when a person experienced a different physical health status. Thus, future research should consider the age of onset of one's limitation, and should further explore the ways that functional impairment trajectories over the life course may affect one's experiences of both institutional and interpersonal discrimination. Sixth, we focused on the United States

only; we encourage cross-national explorations of the linkage between disability and discrimination, with an eye toward identifying the ways that policy contexts may strengthen or weaken this linkage.

Seventh, our data are more than one decade old; more recent data may yield different results, should knowledge of and attitudes towards public accommodations and disability-related discrimination change over this period (Padkapayeva et al., 2017). Finally, we considered only life course stage as a moderator; it is plausible that the effects of disability are more profound for persons with other social or economic disadvantages, including persons with lower levels of education, ethnic minorities, or women. We conducted supplemental analyses and found no significant differences on the basis of gender (results available from authors). Future studies with larger subsamples of ethnic minorities and economically disadvantaged persons should further explore factors that intensify or mitigate against the disability-discrimination link.

6. Conclusions

Despite these limitations, our study provides persuasive evidence that persons with functional limitations face diverse forms of institutional and interpersonal discrimination in the United States. Persons with disability, especially those of working age, perceive that they are subject to unfair treatment in terms of service provision, and daily encounters marked by disrespectful and demeaning treatment. Future studies should explore whether the increasing prevalence of functional limitation in the United States and worldwide will lead to more or less widespread discrimination. The proportion of working-age persons, especially low-income persons, either reporting a physical impairment or receiving disability payments has increased steadily over the past two decades (Joffe-Walt, 2013). Theoretical writings suggest that the specific stigmas eliciting negative reactions from others may change over time as knowledge, values, and public acceptance of "deviant" conditions and behaviors change (Archer, 1985). As more individuals experience relatively young onset of physical limitations, biases may be reduced because awareness of disability-based inequities may increase. However, if disability continues to prematurely befall (and becoming associated with) members of historically stigmatized groups including persons of lower socioeconomic status, ethnic minorities, and persons with mental health conditions or obesity, it is plausible that the stigma will intensify.

Public education and professional training focused on the challenges facing persons with even modest or invisible impairments may help to reduce unfair treatment of them. Working-age persons with functional limitations often require that their employer provides workplace accommodations (Kensbock et al., 2017) or else they may need to transition into an entirely different job that is less physically taxing (Kaye et al., 2011). If experiences of mistreatment prevent these workers from securing new jobs or benefiting from workplace accommodations, then midlife workers with impairment may have no choice but to exit the labor market prematurely, forsaking earnings and the accumulation of wealth in the process.

Educating service providers across a range of industries also is critical. Persons with impairment may avoid or delay seeking necessary services like home repairs and bank loans, as a way to protect themselves from mistreatment. Discrimination in health care settings may render persons with disability reluctant to seek out timely care, a troubling concern given their disproportionately high rates of 25 of the 27 health conditions considered in our study. Underuse of necessary health care services may further exacerbate health disparities between persons with versus without impairment (Krahn et al., 2015; Rogers et al., 2015). Efforts to minimize stigmatization and mistreatment of persons with functional limitation may be critical in mitigating this accumulation of disadvantage and the implications thereof for their life chances (Link and Phelan, 2001).

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.socscimed.2019.112521>.

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