

# Disability as Inequality: Social Disparities, Health Disparities, and Participation in Daily Activities

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Individuals with disabilities experience lower education levels, lower employment rates, fewer household resources, and poorer health than people without disabilities. Yet, despite comprising more than one-eighth of the US population, people with disabilities are seldom integrated into sociological studies of inequality. This study uses time use as a lens through which to understand one type of inequality between working-aged people with and without disabilities: participation in daily activities. It also tests whether social disparities (as suggested by the social model of disability) or health disparities (as suggested by the medical model of disability) explain a larger percentage of participation differences. I first consider if disability predicts daily time in market work, nonmarket work, tertiary (health-related) activities, and leisure—net of health and sociodemographic characteristics. Next, I utilize Oaxaca-Blinder decomposition to assess the relative contribution of these characteristics in explaining time differences. Results from the American Time Use Survey indicate that adults with disabilities spend less time than adults without disabilities in market work and more time in tertiary activities and leisure. There is no difference in nonmarket time. Health accounts for the largest percentage of the explained component of tertiary time differences, but depending on the choice of predictors, sociodemographic characteristics account for as much—or more—of the explained component of differences in market and leisure time. Results indicate the importance of disentangling disability from health in sociological studies of inequality. They also support a hybrid disability model in suggesting that both health and sociodemographic characteristics determine how disability shapes daily life.

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The study of disability has been largely peripheral to the study of inequality within the discipline of sociology (Green and Barnartt 2016)—an oversight that Green and Gerschick (2016) call “inexplicable given the life circumstances of people with disabilities which rival those of the most disadvantaged groups in the United States.” People with disabilities experience lower levels of educational attainment, lower rates of employment, and fewer household resources than people without disabilities (Brault 2012; Erickson, Lee, and Schrader 2016). They also comprise a sizeable percentage of the population. Between 12.6 percent (Erickson, Lee, and Schrader 2016) and 18.7 percent (Brault 2012) of people in the United States are estimated to have some sort of disability—comparable to the percentage of people who are either Black or Hispanic (Humes, Jones, and Ramirez 2011).

The question of how to integrate disability into analyses of inequality is not new (Green and Barnartt 2016; Thomas 2007). Like race, class, and gender, disability has implications for discrimination, status attainment, intergenerational mobility, and stigma (Ameri et al. 2017; Green et al. 2005; Janus 2009). Unlike race, class, and gender, disability fits less neatly into sociological models of ascribed or achieved statuses: Depending on the nature of the impairment, people can transition in and out of disability over the life course (Barnartt 2010; Mann and Honeycutt 2016). Disability is both predicted by (Zhang, Hayward, and Yu 2016) and predictive of (Loprest and Maag 2007) social disparities. As such, approaches to the study of disability and the disablement process remain contested (Thomas 2007).

Nonetheless, the disadvantages faced by people with disabilities are well documented, unequivocal, and omitted from most sociological research. This study contributes to the literature on disability and inequality by investigating how disability shapes everyday life—specifically, time spent in daily activities. Time use is an advantageous lens through which to evaluate inequality because it is a bounded resource and time allocated to one activity carries opportunity costs of not engaging in other activities (Williams, Masuda, and Tallis 2016). Likewise, time use also signals activity participation—including the types of activities that are crucial for inclusion and independent living (Graf 2008; Suh 2016). Understanding *why* people with and without disabilities spend their time differently is one way to understand *how* disability is translated into lived experiences.

This study uses detailed Oaxaca-Blinder decomposition (Blinder 1973; Oaxaca 1973) of data from the American Time Use Survey (ATUS) to evaluate how sociodemographic predictors (as suggested by the social model of disability), health predictors (as suggested by the medical model of disability), or a combination of both (as suggested by hybrid models of disability) explain differences in time use between working-aged people with and without disabilities. In doing so, I focus on four key activity domains of time spent in market work, nonmarket work, leisure activities, and tertiary activities (such as sleep and health care). I also examine if these patterns differ by gender and type of disability.

## Disability and Participation in Daily Activities

Although the Americans with Disabilities Act (ADA) of 1990 emphasized the potential for persons with disabilities to participate fully in American life—with appropriate medical care, rehabilitation, and more equitable social and physical environments—this goal has yet to be realized.<sup>1</sup> Participation differences between people with and without disabilities can be conceptualized across four broad activity domains.

Disability decreases the likelihood and intensity of *market work* (Bureau of Labor Statistics [BLS] 2016a), participation in which is the norm for most working-aged adults and a policy priority for working-aged adults with disabilities. Less than one-third of the noninstitutionalized population of working-aged people with disabilities are employed, compared to 72 percent of those without disability. Among those who are employed, 29 percent of workers with disabilities usually work part-time, versus 17 percent of workers without disabilities. Anand and Ben-Shalom's (2014) analysis of time use found that paid work was the domain in which people with and without disabilities were most different: working-aged men and women with a disability spent up to 321 and 289 fewer minutes less in paid work, daily, than men and women without disability.

Evidence for differences in *nonmarket work*—activities such as volunteering, housework, and care work that reflect productivity outside the market—is more mixed. Shandra (2017) found that people with disabilities were less likely than those without disabilities to report volunteering within an organization; however, Anand and Ben-Shalom (2014) found no difference in volunteer time, net of controls. Adults with disabilities report as much or more time in child care, and the same amount or negligibly less time in other types of care work (Anand and Ben-Shalom 2014; Shandra and Penner 2017). Although there is evidence (Shandra and Penner 2017) of a negative association between disability and housework time for men and women, other analyses (Anand and Ben-Shalom 2014) find that men with disabilities do less—and women with disabilities do more—housework than those without disabilities.

*Tertiary* time use includes many activities required to maintain health—including sleep, personal care, and eating and drinking. Disability positively associates with time in health-related self-care and medical care for both men and women, but negatively associates with time eating and in personal care for women (Anand and Ben-Shalom 2014). People with disabilities spend more time sleeping, on average, than people without disabilities (Anand and Ben-Shalom 2014); however, other evidence suggests a curvilinear relationship such that people with disabilities are at higher risk than those without disabilities of both short and long sleep, compared to mid-range sleep (Shandra, Kruger, and Hale 2014).

*Leisure* is also important for well-being (Kahneman et al. 2004), is typically more flexibly allocated than other types of time use (Williams, Masuda, and Tallis 2016), and is the primary form of substitution for market work (Aguiar, Hurst, and Karabarbounis 2013). Anand and Ben-Shalom (2014) find that men and women with disability spend up to 142 and 83 minutes more per day in

leisure, respectively, than those without disabilities. Although people with disabilities experience social and physical exclusion from leisure and recreational facilities (Rimmer 2005; Stumbo, Wang, and Pegg 2011), there is evidence that they reallocate time from social and cultural forms of entertainment to passive forms of leisure (Pagán-Rodríguez 2014).

Taken together, these four domains differentiate between productive activities (market and nonmarket work) and consumptive activities (tertiary and leisure activities) (Gershuny 2011).<sup>2</sup> Distinguishing between market and nonmarket work is advantageous when considering time use among people with disabilities, who experience barriers to formal employment including a lack of transportation, lack of accessibility, stigma from coworkers and employers, and hiring discrimination (Ameri et al. 2017; BLS 2013; Wright et al. 2012). Despite these barriers, most want to work (Ali, Schur, and Blanck 2011) and spend substantial amounts of time in nonmarket productivity (Shandra and Penner 2017). Likewise, distinguishing between tertiary and leisure disaggregates activities that may be directly necessary for maintaining health—particularly sleep (Biddle and Hamermesh 1990)—from those that may be more discretionary (Williams, Masuda, and Tallis 2016). Because time invested in one domain necessarily detracts from time in another, considering these four domains in tandem suggests how trade-offs are made.

## Models of Disability

Time use is socially patterned because not all people are equally likely or able to participate in all types of time use (Flood, Hill, and Genadek 2018; Lewis and Weigert 1981). Models of disability suggest competing explanations for how disability might affect time use; however, most consider activity participation to be a central component of disablement—a distinction that originated with early theorizing by disability rights organizations:

...we define *impairment* as lacking part of or all of a limb, or having a defective limb, organ or mechanism of the body; and *disability* as the disadvantage or restriction of activity caused by a contemporary social organisation which takes no or little account of people who have physical impairments and thus excludes them from *participation* in the mainstream of social *activities*. Physical disability is therefore a particular form of social oppression. (Union of the Physically Impaired Against Segregation 1975, 14; emphasis mine)

In this social model of disability, disability is not defined by health and deviation from ideal function as a medical model might suggest—but by the disadvantages experienced by people with disabilities in addition to their impairments. Activity participation is a key component of the social model because people with disabilities have been historically segregated and denied the same opportunities for education, independent living, and family formation as people without disabilities (Kevles 1985; Lamb and Bachrach 2001). Differences in educational attainment, community integration, and family structure reflect these barriers.

The social model points to society as the primary source of disablement (Oliver 2013); however, one critique is that it ignores the role of impairment and fails to acknowledge that people are disabled by their bodies as well as by society (Shakespeare and Watson 2001). In response, “hybrid” models of disability, including the World Health Organization’s (WHO) International Classification of Functioning, Disability, and Health (ICF) (WHO 2001b), combine both health and social elements: *Health conditions* (including diseases, disorders, and injuries) are distinct from *impairments* in body functions or structures, which are distinct from *personal* and *environmental factors* (including socioeconomic characteristics and social support)—however, health, impairment, and personal and environmental factors are interrelated. Other frameworks, including Nagi’s (1965) Disablement Model and Verbrugge and Jette’s (1994) Disablement Process Model, suggest similarly.<sup>3</sup>

Empirical attempts to disentangle the contributors to differences in activity participation by disability status are limited, despite ongoing theoretical debate about the disablement process (Shakespeare 2013; Thomas 2007). This study builds upon studies documenting *if* differences in participation exist by disability status (Anand and Ben-Shalom 2014; Schur, Kruse, and Blanck 2013; Shandra 2017) to examine contributors to *why* they exist.

## Contributors to Differences in Activity Participation

### *Health characteristics*

In response to the employment provisions of the ADA,<sup>4</sup> economist Walter Oi (1991) suggested that people with disabilities spend less time in paid work because they needed more time for sleep, personal care, and investments in health capital—including medical visits and time to recover from illness (Grossman 1972). To Oi, disability was a state in which an individual’s stock of health capital had fallen below some critical level, and these low levels “surely affect the amount of time...that an individual can devote to work in the market, work at home, or leisure” (Oi 1991, 38). A person with a disability’s health was considered the primary contributor to their lack of participation in certain types of activities.

Poor health takes time to manage. People with poorer self-rated health report a greater number of health care visits than those in better health (National Center for Health Statistics [NCHS] 2014). They also spend more time in health-related self-care (Jonas, Ibuka, and Russell 2011) and more time sleeping (Podor and Halliday 2012). Health relates to other types of time use: net of sociodemographic controls, poorer self-rated health negatively associates with market and nonmarket time and positively associates with leisure time (Podor and Halliday 2012).

People with disabilities have poorer self-rated health than people without disabilities (NCHS 2014). They disproportionately experience chronic conditions such as hypertension (Froehlich-Grobe et al. 2016; Reichard, Stolze, and Fox 2011) and other markers of poor health such as pain and fatigue (Kinne,

Patrick, and Doyle 2004; Patterson et al. 2012). There is limited research at the intersection of disability, health, and time use among working-aged adults in the United States; however, Pagán's (2013) analysis of Spanish data found that—among men and women with disabilities—poorer self-rated health reduced time in market work, increased time in leisure, increased time in nonmarket work (for men only), and increased time in tertiary activities (for women only).

### ***Socioeconomic and demographic characteristics***

Although health is one potential explanation for how disability affects daily life, social disparities—including socioeconomic and demographic characteristics—also correlate with disability and with time use. Additionally, they are central to the social and hybrid disability models, with the ICF providing a useful categorization scheme: personal factors include internal influences such as gender, race, age, and education. Environmental factors include external influences such as family support, transportation, and housing services.<sup>5</sup> Together, these characteristics represent the context in which people experience disability (Jette 2006; WHO 2001a,b).

Individuals with more education spend more time in market work, less time in leisure, and less time in tertiary activities than those with less education (BLS 2016b). Higher household income associates with more time in market work and less time in nonmarket work, tertiary activities, and leisure (Vernon 2010). Those who are married spend more time in nonmarket work and less time in tertiary activities and leisure than those who are single or not married (BLS 2016b; Vernon 2010). Marriage positively associates with paid work time for men, but negatively or negligibly for women (BLS 2016b; Vernon 2010). Household children—especially preschool aged—increase nonmarket time via child care, decrease market time for women, and decrease leisure time for women and men (Krantz-Kent 2005).

Demographic characteristics are also predictive. Foreign-born men spend more market and tertiary time, but less nonmarket and leisure time, than US-born men. Foreign-born women spend more nonmarket and tertiary time than US-born women, but less market and leisure time (Hwang 2016; Ribar 2012). Racial/ethnic differences have been documented (BLS 2016b; Sayer and Fine 2011), although they vary by gender and activity domain. Finally, age has a curvilinear association, with adults of childrearing age reporting the most time in market and nonmarket work and the least time in tertiary and leisure activities (BLS 2016b; Krantz-Kent 2009).

Social disparities between people with and without disabilities are well documented. Adults with disabilities have lower levels of education than those without disabilities, are less likely to be employed, and are more likely to live in poverty (BLS 2016a; Brault 2012). They are less likely to be married, less likely to live with coresident children, and more likely to live alone (Altman and Bernstein 2008; Anand and Ben-Shalom 2014; Schur, Kruse, and Blanck 2013). Disability is more prevalent among those who identify as non-Hispanic Black and less prevalent among those who identify as Hispanic or other racial/ethnic

backgrounds, versus Non-Hispanic white (Goyat, Vyas, and Sambamoorthi 2016). Finally, those who are older are more likely than those who are younger to have a disability, and those who are foreign-born are less likely than those who are US-born to have a disability (Brault 2012; Huang et al. 2011).

Time use data has been used by social scientists to describe inequalities across multiple domains. The present study cannot speak to causality or the process of disablement; however, it builds upon this tradition by identifying which factors are most important in explaining differences in time use by disability status.

## Data and Methods

### *Data source and sample*

Data are analyzed from the publicly available American Time Use Survey (ATUS), a nationally representative survey sponsored by the US BLS that collects information on daily time use (Hofferth, Flood, and Sobek 2017). Respondents aged 15 and over were chosen randomly from households that had undergone their final interview for the Current Population Survey (CPS), with the ATUS collected two to five months after the final CPS interview. The sample was randomized by day such that half of the CPS respondents contacted to participate in the ATUS were assigned to report on weekdays. Computer-assisted telephone interviewing was used to ask respondents to provide demographic information and a detailed account of their activities for each minute during a 24-hour period beginning at 4:00 a.m. The “diary day” is the day about which each respondent reports.

Although the ATUS includes detailed information on time use and socioeconomic and demographic characteristics for every year, concurrent information on disability and health is available more sporadically. Detailed disability data was introduced in mid-2008, for an initial sample size of 66,910 diary days. Among the years that include disability information, data on both general and self-rated health was only collected from a subset of respondents in the Well-Being Module fielded in 2010, 2012, and 2013. Of those 34,566 eligible module respondents, 26,447 are between 18 and 64 years of age and 83 are excluded due to any interviewer-reported data quality problem. The final sample includes 11,906 men and 14,458 women. All analyses are weighted using the Well-Being Module respondent weights (see the ATUS User’s Guide [BLS 2016c] for more information) with corresponding subpopulations defined in Stata 14.2. All data were downloaded from the online extract builder ATUS-X (Hofferth, Flood, and Sobek 2017); no additional linking was performed.

### *Dependent measures*

The ATUS includes 17 major categories in its activity lexicon (Shelley 2005), categorized here into nonmarket work (household activities, caring for and helping household and non-household members, volunteering, and purchasing and using goods and services except medical and personal care services), market



work (work and work-related activities), tertiary activities (sleeping, personal care, eating and drinking, medical and care services), and leisure (socializing and leisure, sports and recreation, religious activities). Telephone calls to family and friends are categorized as leisure, while those associated with purchasing and using goods and services are categorized as nonmarket work. The only categories not accounted for in these analyses are the residual telephone and travel codes (as they are otherwise unclassifiable) and education (as it is not directly compensated as market work nor does it have exchange value as nonmarket work).

This scheme is based on [Pagán's \(2013\)](#) categorization of disability and time use in the Spanish Time Use Survey and follows [Frazis and Stewart's \(2011\)](#) use of the ATUS. Like [Frazis and Stewart \(2011\)](#) and [BLS \(2016b\)](#) reports, associated travel time is combined with corresponding activity categories. Unlike [Frazis and Stewart \(2011\)](#), volunteer work is considered nonmarket work because it could have market value and be considered a productive activity ([Salamon, Sokolowski, and Haddock 2011](#)). Time spent in care to nonhousehold children and adults is included as nonmarket time for the same reasons.

## ***Disability***

In 2008, a module was added to the CPS to assess six detailed aspects of disability, including hearing difficulty, vision difficulty, difficulty remembering, physical difficulty, mobility limitation, and personal care limitation. These questions were designed to correspond to “four basic areas of functioning (vision, hearing, mobility, and cognitive functioning) that identified the largest component of the population of people with disabilities...[and] two key elements that could be used for monitoring independent living and the need for services” ([Brault, Stern, and Raglin 2007](#), 4). For most respondents, these questions were collected five to eight months before the ATUS.<sup>6</sup> Individuals are considered to have a disability if they answer affirmatively to any of these six measures.

Supplemental analyses explore heterogeneity by disability type by disaggregating the overall disability indicator by the presence of a sensory, cognitive, or physical limitation. A respondent is coded as having a sensory limitation if they report being deaf/having serious difficulty hearing or being blind/having serious difficulty seeing even when wearing glasses. Cognitive limitation indicates if a respondent has serious difficulty concentrating, remembering, or making decisions because of a physical, mental, or emotional condition. Physical limitation indicates if the respondent has serious difficulty walking or climbing stairs. These indicators are not mutually exclusive, as some respondents may have multiple conditions. The reference group, “no disability,” is the same for each disability type.<sup>7</sup>

## ***Socioeconomic, demographic, and control measures***

All available general health indicators in the Well-Being Module are utilized in these analyses. Self-rated health asks respondents: “Would you say your health in general is excellent, very good, good, fair, or poor?” All levels are included



categorically, using good as the reference category.<sup>8</sup> Respondents are coded as having hypertension if they were told by a doctor or other health professional that they had hypertension in the past five years. They are asked if they took any pain medication (“such as Aspirin, Ibuprofen or prescription pain medication”) on diary day. Respondents are also asked if they felt very (reference), somewhat, a little, or not at all well rested when they woke up on diary day. All health information is assessed at the time of the ATUS interview.

Education is measured as the respondent’s highest completed level of education and includes less than high school, high school diploma (including GED and some college), and bachelor’s degree or higher. Marital status is a three-category indicator of married or cohabiting, widowed or divorced or separated, and single (never married and not cohabiting). Immigrant status compares those who are foreign-born to those who are born in the United States, Puerto Rico or US Outlying Areas, or abroad of American parents. The presence of children ages 0–5, 6–12, and 13–17 are dichotomous indicators of whether the respondent has an own (biological, step, or adopted) child of each age category living in the household, each compared to the category of no household children. Number of household adults is a continuous measure of the number of persons aged 18 and older living in the respondent’s household, irrespective of their relationship to the respondent.

Age in years is included as five-year age categories. Family income distinguishes between less than \$25,000, \$25,000–\$49,999, \$50,000–\$74,999, and \$75,000 plus. ATUS began imputing missing data for family income in 2010, with rates of missing data averaging over 13 percent for previous years. Thus, missing values were replaced with the median income level by education, gender, and year. Metropolitan residence is a Census-defined measure that indicates if respondents live in a metropolitan area, versus nonmetropolitan or unidentified areas (reference). Housing type indicates if respondents live somewhere other than a house, apartment, or flat (reference), such as a motel or trailer. Homeownership indicates if respondents own or are buying their housing unit, versus renting or occupying without payment (reference).<sup>9</sup> Finally, dichotomous controls are included for survey year, region, and if the interview occurred on a weekend or holiday. All demographic variables are collected at the time of the CPS, with household composition updated at the time of the ATUS interview.

### ***Analytic strategy***

Although time use data offer the opportunity to understand how individuals spend their daily lives, they are methodologically unique in that zeros can arise either because a respondent does not regularly perform an activity *or* because the respondent regularly performs the activity but not on diary day. In the latter case, zeros do not arise from censoring, but in the discrepancy between the occurrence of an observation and the observation window—which, for the ATUS, is 24 hours. Foster and Kalenkoski (2013, 3010) examine this potential measurement problem by comparing OLS and Tobit models of Australian Time Use Surveys, which have a multi-day data collection period and allow for either

a 24-hour or 48-hour observation period. They conclude that “the percentage of false zeroes per se does not seem to influence the qualitative results from either OLS or Tobit estimation.” Stewart (2013, 263) likewise examined the performance of OLS, Tobit, and Cragg models to simulated time use data and the ATUS, concluding that “only OLS generates unbiased estimates in all of the simulations considered here.” OLS is therefore utilized in these analyses to estimate all dependent variables. Following other research using these data to examine differences in time use (Anand and Ben-Shalom 2014; Hwang 2016; Moen and Flood 2013; Podor and Halliday 2012; Ribar 2012; Sayer and Fine 2011), all analyses are stratified by gender.

The analysis first proceeds by using OLS to examine differences in contributors to market work, nonmarket work, tertiary activities, and leisure for adults with and without disabilities. Next, I utilize an Oaxaca-Blinder (Blinder 1973; Oaxaca 1973) twofold approach, specifically Stata’s *oaxaca* command (Jann 2008), to decompose the observed difference in time spent in each activity domain by disability status into the explained component and the unexplained component. The explained component reflects the part of the gap attributable to group differences in the explanatory variables. The unexplained component reflects the residual difference that cannot be accounted for by the explanatory variables in the model.<sup>10</sup> I then examine the detailed decomposition of the explained component, which allows me to assess the relative contribution of specific predictors.

Model diagnostics were assessed for all equations, stratified by disability status. Influential cases in unweighted OLS models were identified using Cook’s D, with all values falling below 0.13. Variance inflation factors (VIFs) were examined to assess multicollinearity, with mean overall VIFs less than 2.0 and highest among the marital status (3.5) and education (4.7) measures. All models are weighted to account for survey design.

## Results

### *Bivariate analysis*

Table 1 presents weighted estimates of mean minutes in market work, nonmarket work, tertiary activities, and leisure by gender and the presence of any disability. T-tests are reported from adjusted Wald tests. Results indicate significant differences in time use for men and women in all activity domains *except* nonmarket work. The largest difference occurs in market work, with men (women) with any disability spending 177 (155) fewer minutes than men (women) without disability. As there are no significant differences in nonmarket work by the presence of any disability, market work is made up by tertiary activities and leisure. Men (women) with any disability spend 53 (54) minutes more in tertiary time than men (women) without disability. The leisure gap is much wider, with men (women) with any disability reporting 139 (128) more minutes than men (women) without disability.

**Table 1. Distribution of time use and explanatory variables, by gender and disability status**

	Men		Women	
	Without disability	Any disability	Without disability	Any disability
<i>Time use variables (minutes per day)</i>				
Market work	311.63	134.45***	227.75	72.36***
Nonmarket work	156.52	154.22	251.61	238.61
Tertiary activities	621.41	674.40***	649.15	703.21***
Leisure	313.33	452.75***	271.27	398.86***
<i>Socioeconomic, demographic, and health variables</i>				
Age	40.02	47.64***	40.39	49.57***
Education				
Less than high school	11.48	19.48***	9.67	19.83***
High school diploma	57.13	65.74***	55.99	65.47***
Bachelor's degree or more	31.38	14.79***	34.34	14.69***
Marital status				
Single	29.76	28.68	24.89	21.77
Married or cohabiting	61.72	49.27***	62.34	45.85***
Widowed, divorced, or separated	8.52	22.04***	12.77	32.38***
Presence of children ages 0–5	15.86	5.05***	19.19	5.80***
Presence of children ages 6–12	17.71	8.00***	20.37	10.11***
Presence of children ages 13–17	13.08	7.27***	15.07	10.26***
Number of household adults	2.36	2.17**	2.29	1.95***
Immigrant	17.33	5.91***	16.08	6.19***
Race/ethnicity				
Non-Hispanic White	65.37	71.94**	65.06	67.18
Hispanic	17.26	10.26***	15.94	10.68***
Non-Hispanic Black	11.23	13.56	13.06	17.61**
Other	6.13	4.23*	5.94	4.52
Family income				
Less than \$25,000	16.20	44.37***	19.17	50.92***
\$25,000–49,999	24.95	26.09	25.74	25.85
\$50,000–74,999	20.51	11.37***	19.31	10.68***
\$75,000 or more	38.34	18.17***	35.78	12.56***
Homeownership	70.34	60.40***	70.39	59.21***

*(Continued)*

Table 1. continued

	Men		Women	
	Without disability	Any disability	Without disability	Any disability
Other housing type	4.55	10.03***	4.12	9.92***
Metropolitan residence	84.37	77.68***	84.67	73.95***
Self-rated health				
Excellent	19.99	6.88***	20.55	3.15***
Very good	36.10	17.95***	35.19	9.95***
Good	31.59	25.96**	30.22	23.73***
Fair	10.55	28.30***	11.91	34.16***
Poor	1.77	20.91***	2.13	29.00***
Hypertension	24.48	46.25***	20.16	48.27***
Pain medication	21.40	50.96***	26.85	63.53***
Feels rested				
Very	40.28	31.27***	37.01	25.02***
Somewhat	40.42	38.89	40.02	36.60
A little	14.45	20.41**	15.77	22.51***
Not at all	4.85	9.43***	7.20	15.88***
N	10,975	931	13,288	1,170

**Source:** American Time Use Survey. Data are weighted means (for linear measures) and percentages (for categorical measures) rounded to the nearest hundredth. Difference between those with no disability and those with disability within each gender is significant at \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$  (two-tailed tests).

Table 1 also includes distributional measures of demographic, socioeconomic, and health characteristics. Statistically significant differences between adults with and without disability were examined using t-tests (for continuous measures) or Stata’s *lincom* command (for categorical measures) (StataCorp 2015). Men and women with disabilities are significantly older, less likely to have a bachelor’s degree, and less likely to be immigrants than those without disability. They are also less likely to be married, to live with household children, and they live with fewer household adults. The modal income category for people with disabilities is less than \$25,000, but \$75,000 or more for those without disability. People with disabilities are less likely to own their own home, more likely to live in housing that is not a house or apartment, and less likely to live in a metropolitan area. There are also significant health differences: poor self-rated health is reported by 2 percent of those without disabilities but 21 percent of men and 29 percent of women with disabilities. Hypertension and use of pain medication are higher for those with disabilities, and they report feeling less rested.

## OLS analysis

The relationship between disability and time use was first assessed by estimating OLS equations for the pooled sample of those with and without disabilities, including a dichotomous indicator for any disability (pooled results available upon request). The disability indicator was significant at  $p < 0.001$  for market work ( $\beta[\text{men}] -101.28$ ;  $\beta[\text{women}] -108.35$ ), tertiary activities ( $\beta[\text{men}] 33.29$ ;  $\beta[\text{women}] 39.18$ ), and leisure ( $\beta[\text{men}] 72.69$ ;  $\beta[\text{women}] 63.78$ ). These coefficients indicate that there are differences in time use by disability status, net of socioeconomic, demographic, and health characteristics. The coefficients also comprise the unexplained component of the decomposition analyses (see tables 4 and 5). Disability was not significant in nonmarket models.

Tables 2 (men) and 3 (women) report OLS results of time spent in market work, nonmarket work, tertiary activities, and leisure, stratified by the absence or presence of any disability. Results suggest that the contributors to time use vary by both disability status and gender. Focusing on market work, only family income and self-rated health consistently associate for men and women with and without disabilities. Comparisons between models using adjusted Wald tests indicate that the coefficients for self-rated health and for feeling rested differ significantly between adults with and without disability, as do those for age. For nonmarket work, only the presence of children aged 0–5 consistently positively associates for men and women with and without disability. Homeownership coefficients differ between men with and without disability, with age, race/ethnicity, and self-rated health coefficients differing for women. The coefficients for tertiary activities differ only for men who are non-Hispanic Black, metropolitan residents, and in fair health, and for women in the youngest age group. The presence of children aged 6–12 and income predict leisure time for men and women with and without disability, although the coefficients for income differ by disability status.

## Decomposition analysis

Tables 4 (men) and 5 (women) display the decomposition of OLS results from tables 2 and 3 for those with and without any disability. I first discuss the three components in the total decomposition: the observed difference (“disability gap” in time use), the explained component of the observed difference (attributable to group differences in the explanatory variables), and the unexplained component of the observed difference (residual). The observed difference for men’s market time (177.19) can be calculated from table 1 by subtracting the total minutes of market time for men with any disability (134.45) from those of men without disability (311.63), with slight differences attributable to rounding. The unexplained component (101.28) reflects the  $\beta$  coefficient for the disability indicator in the pooled model, if men with any disability were the reference category. The explained component (75.91) is the difference between the observed component (177.19) and the unexplained component (101.28).

**Table 2. OLS regressions on time use for men with and without disability**

	Market work		Nonmarket work		Tertiary activities		Leisure	
	Without disability	Any disability	Without disability	Any disability	Without disability	Any disability	Without disability	Any disability
Age								
18–25 years	46.50*	76.90	–60.57***	–2.03	12.82	1.58	–56.77***	–73.32
26–30 years	113.36***	181.91**	–46.85***	60.44	–4.07	–48.29	–74.69***	–185.02***,†
31–35 years	128.54***	24.59	–37.28***	5.78	–10.40	–24.09	–82.84***	–70.24
36–40 years	111.91***	82.71	–24.43*	–54.65	–7.16	–5.36	–82.43***	–10.46
41–45 years	132.91***	74.96	–34.39**	–14.76	–11.02	–25.91	–86.00***	–26.69
46–50 years	122.16***	24.09†	–34.59***	–10.81	–9.61	–30.69	–78.11***	14.29†
51–55 years	121.63***	36.10†	–14.89	–17.10	–16.42*	–32.28	–83.98***	19.95†
56–60 years	106.77***	0.45†	–24.71*	–1.49	–19.02*	–3.10	–56.83***	5.34
61–64 years ( <i>ref.</i> )								
Education								
Less than high school ( <i>ref.</i> )								
High school diploma	21.26	–5.56	–2.11	2.05	–7.65	26.88	–9.75	–31.44
Bachelor's degree or more	34.48*	8.86	–1.47	–6.56	–8.57	1.10	–28.42*	–11.43
Marital status								
Single ( <i>ref.</i> )								
Married or cohabiting	55.61***	56.23*	24.43***	36.31	–7.27	–17.75	–48.53***	–55.57*
Widowed, divorced, or separated	32.16*	–11.41	15.69*	27.48	–11.67	0.48	–21.67*	–2.99

Presence of children ages 0–5	2.78	–7.07	60.08***	97.87*	–20.22***	–48.83	–33.32***	–43.56
Presence of children ages 6–12	–10.83	25.77	33.84***	40.96	–6.28	–4.98	–19.18**	–63.11*
Presence of children ages 13–17	8.49	23.18	11.67	11.67	–8.16	–11.99	–10.81	–23.03
Number of household adults	–19.54***	–37.83**	–1.64	–9.48	–2.99	12.38	14.40***	32.52*
Immigrant	51.99***	23.08	–26.00***	–61.53*	9.42	49.30	–42.43***	–25.55
Race/ethnicity								
Non-Hispanic White ( <i>ref.</i> )								
Hispanic	–0.84	–19.32	1.28	32.35	13.28	21.54	–6.51	–26.40
Non-Hispanic Black	–35.58**	–15.45	–11.35	–24.74	–4.41	–60.30** <sup>†</sup>	56.02***	108.23***
Other	–30.21	–90.09**	7.46	30.49	28.47**	7.97	–2.93	28.40
Family income								
Less than \$25,000 ( <i>ref.</i> )								
\$25,000–49,999	43.99***	14.24	–10.84	8.31	–4.28	34.92	–11.82	–65.66** <sup>†</sup>
\$50,000–74,999	66.05***	68.60*	–5.34	7.78	–6.72	17.19	–26.90**	–87.40**
\$75,000 or more	79.88***	154.32***	–10.59	–16.94	–9.94	–28.29	–42.17***	–107.65**
Homeownership	3.56	14.74	12.39**	48.62** <sup>†</sup>	–0.43	–32.34*	–12.25	–28.94
Other housing type	–16.57	–12.49	–4.60	–18.95	14.77	1.21	21.72	29.25
Metropolitan residence	–12.79	–3.82	–4.49	–10.78	8.25	–39.69 <sup>†</sup>	1.15	43.25

(Continued)



Table 2. *continued*

	Market work		Nonmarket work		Tertiary activities		Leisure	
	Without disability	Any disability	Without disability	Any disability	Without disability	Any disability	Without disability	Any disability
Self-rated health								
Excellent	13.27	-9.76	-2.31	14.27	0.88	-15.58	-10.42	2.01
Very good	14.37	42.57	-5.06	-16.11	-0.38	1.63	-9.11	-9.41
Good ( <i>ref.</i> )								
Fair	-12.55	-71.19*** <sup>†</sup>	-6.82	-6.00	12.35	51.75*** <sup>†</sup>	25.69*	18.72
Poor	-102.66***	-89.83**	-21.67	-31.28	54.49**	88.84***	87.74***	29.93
Hypertension	-3.74	-25.98	5.04	-16.07	5.22	10.37	-7.49	26.47
Pain medication	-33.92***	-35.10	-3.62	16.99	12.30**	-5.78	16.37*	23.93
Feels rested								
Very ( <i>ref.</i> )								
Somewhat	41.00***	92.23*** <sup>†</sup>	-9.81*	-32.10	-23.17***	-27.01	-13.56*	-17.22
A little	62.03***	55.36*	-19.17**	-30.50	-30.14***	9.78	-27.04**	-7.55
Not at all	81.31***	65.46*	-1.92	16.46	-54.47***	-13.16	-53.25***	-38.92
Constant	191.23***	136.32**	167.41***	155.91***	640.09***	664.90***	406.02***	432.38***
R <sup>2</sup>	0.269	0.297	0.105	0.112	0.086	0.128	0.194	0.215
N	10,975	931	10,975	931	10,975	931	10,975	931

**Source:** American Time Use Survey. Data shown are linear regression coefficients unless otherwise noted. All results are weighted. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$  (two-tailed tests). *Ref.* indicates the reference category.

<sup>†</sup> Difference between coefficients for those with and without disability is significant at  $p < 0.05$  within each time use category. Models also control for region, survey year, and weekend/holiday interview day.

**Table 3. OLS regressions on time use for women with and without disability**

	Market work		Nonmarket work		Tertiary activities		Leisure	
	Without disability	Any disability	Without disability	Any disability	Without disability	Any disability	Without disability	Any disability
Age								
18–25 years	42.69**	44.04	–94.91***	23.94 <sup>†</sup>	55.23***	–68.73 <sup>†</sup>	–69.95***	–42.44
26–30 years	99.22***	45.31	–83.83***	–23.26	40.88***	1.78	–81.06***	–54.20
31–35 years	92.44***	56.33	–63.00***	24.56	28.80**	–3.10	–75.84***	–90.59*
36–40 years	108.39***	72.74	–57.82***	–14.17	12.74	0.72	–75.04***	–73.70
41–45 years	90.22***	36.68	–44.32***	62.39 <sup>†</sup>	15.24	–13.06	–69.29***	–77.76*
46–50 years	119.22***	–6.87 <sup>†</sup>	–33.41**	55.37 <sup>†</sup>	–5.34	12.99	–80.24***	–64.07*
51–55 years	116.69***	–3.59 <sup>†</sup>	–32.12**	22.06 <sup>†</sup>	–14.69	–20.47	–70.62***	–5.05 <sup>†</sup>
56–60 years	51.69***	15.23	–11.19	43.01 <sup>†</sup>	0.42	–13.18	–38.96***	–41.40
61–64 years ( <i>ref.</i> )								
Education								
Less than high school ( <i>ref.</i> )								
High school diploma	62.33***	17.20 <sup>†</sup>	–11.90	–1.55	–18.45**	–33.34	–25.88**	1.81
Bachelor's degree or more	91.16***	61.00*	–13.19	–8.56	–27.72***	–60.41*	–37.47***	–22.11
Marital status								
Single ( <i>ref.</i> )								
Married or cohabiting	–24.79**	–19.17	45.29***	51.63*	8.19	–3.77	–22.07**	–32.39

(Continued)

Table 3. *continued*

	Market work		Nonmarket work		Tertiary activities		Leisure	
	Without disability	Any disability	Without disability	Any disability	Without disability	Any disability	Without disability	Any disability
Widowed, divorced, or separated	35.68**	1.95	-0.96	31.00	-3.49	-1.80	-27.45**	-32.81
Presence of children ages 0-5	-58.09***	-58.87*	146.97***	174.27***	-25.26***	13.43	-39.22***	-105.51** <sup>†</sup>
Presence of children ages 6-12	-37.23***	-5.55	68.99***	72.51**	-18.37***	-8.04	-15.70**	-52.27*
Presence of children ages 13-17	-31.81***	6.11	51.48***	58.72*	-10.10*	-41.20	-8.96	-28.65
Number of household adults	-6.00	-12.53	2.36	-3.72	-0.79	4.65	2.20	1.28
Immigrant	-4.01	74.37** <sup>†</sup>	25.91**	-33.99	3.24	-0.66	-20.68**	-46.22
Race/ethnicity								
Non-Hispanic White (ref.)								
Hispanic	10.37	-38.50** <sup>†</sup>	2.73	-12.21	8.57	24.67	-31.13***	14.16
Non-Hispanic Black	-6.15	-34.79*	-42.67***	0.01 <sup>†</sup>	13.74*	5.90	16.99*	18.08
Other	-10.47	-44.07	-17.39	17.36	21.45**	41.58	-5.53	0.76
Family income								
Less than \$25,000 (ref.)								
\$25,000-49,999	49.85***	35.99	-9.77	29.31	-11.11*	19.30	-21.18**	-79.99** <sup>†</sup>
\$50,000-74,999	69.30***	45.13	-23.38**	16.34	-9.56	-4.95	-32.58***	-45.46
\$75,000 or more	70.05***	63.68*	-18.72*	12.88	-8.29	-25.02	-37.13***	-33.67

Homeownership	-5.91	8.60	9.68	42.75*	1.05	4.62	-6.59	-55.16** <sup>†</sup>
Other housing type	4.54	-21.13	15.49	16.29	0.03	-26.42	-8.92	36.45
Metropolitan residence	-5.95	-9.09	-7.19	3.06	7.75	7.41	-2.04	-7.70
Self-rated health								
Excellent	5.38	104.43** <sup>†</sup>	-0.73	-96.59** <sup>†</sup>	-4.82	-41.69	-6.72	-30.17
Very good	18.18*	27.99	-8.45	34.00	-2.90	-14.51	-10.05	-51.74
Good ( <i>ref.</i> )								
Fair	-10.69	-38.28*	2.27	-12.67	0.72	31.53	11.17	8.07
Poor	-75.09**	-65.80**	2.52	-39.44	39.57**	56.33**	35.51	39.33
Hypertension	-7.52	10.99	-0.01	-18.61	-2.75	6.02	11.04*	10.40
Pain medication	-19.60**	-9.74	-2.95	-6.84	18.63***	-1.91	10.10*	22.33
Feels rested								
Very ( <i>ref.</i> )								
Somewhat	39.17***	14.73	-4.44	-21.16	-24.57***	-9.12	-18.84***	7.18
A little	49.15***	0.95 <sup>†</sup>	-10.07	3.88	-33.89***	-3.70	-25.39***	6.42
Not at all	43.34**	15.87	-12.27	-33.09	-19.25*	29.60	-19.00	-9.54
Constant	116.91***	75.85	242.75***	179.33***	650.49***	674.60***	401.23***	523.986*** <sup>†</sup>
R <sup>2</sup>	0.207	0.163	0.183	0.141	0.095	0.079	0.145	0.173
N	13,288	1,170	13,288	1,170	13,288	1,170	13,288	1,170

**Source:** American Time Use Survey. Data shown are linear regression coefficients unless otherwise noted. All results are weighted. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$  (two-tailed tests). *Ref.* indicates the reference category.

<sup>†</sup> Difference between coefficients for those with and without disability is significant at  $p < 0.05$  within each time use category. Models also control for region, survey year, and weekend/holiday interview day.

**Table 4. Decomposition of the disability gap in time use for men with and without disability**

	Market work		Nonmarket work		Tertiary activities		Leisure	
	Coefficient	%	Coefficient	%	Coefficient	%	Coefficient	%
<i>Total decomposition</i>								
Observed difference	177.19***	100.00	2.30	100.00	-52.99***	100.00	-139.42***	100.00
Explained component	75.91***	42.84	6.70	291.74	-19.70***	37.18	-66.74***	47.87
Unexplained component	101.28***	57.16	-4.40	-191.74	-33.29***	62.82	-72.69***	52.13
<i>Detailed decomposition, explained component</i>								
Age	9.03**	11.90	-7.29***	-108.87	1.85	-9.38	-9.62***	14.42
Education	3.85*	5.08	0.04	0.59	-0.69	3.49	-3.97**	5.95
Marital status	3.47	4.58	0.96	14.27	0.24	-1.20	-3.59*	5.37
Presence of children	0.01	0.01	10.52***	156.99	-3.24***	16.44	-6.42***	9.62
Number of household adults	-3.79**	-4.99	-0.46	-6.87	-0.41	2.11	2.87*	-4.30
Immigrant	6.00***	7.90	-3.05***	-45.47	1.21	-6.13	-4.92***	7.37
Race/ethnicity	0.07	0.09	0.70	10.40	1.65**	-8.38	-2.01	3.02
Family income	23.09***	30.42	-2.38	-35.58	-2.23	11.34	-13.05***	19.55
Homeownership	0.26	0.35	1.58**	23.57	-0.21	1.04	-1.35	2.02
Other housing type	0.91	1.20	0.35	5.16	-0.78	3.94	-1.27	1.90
Metropolitan residence	-0.77	-1.02	-0.38	-5.65	0.32	-1.63	0.31	-0.47
Self-rated health	27.42***	36.12	5.05	75.43	-16.21***	82.27	-21.87***	32.77
Hypertension	1.54	2.02	-0.69	-10.35	-1.41	7.14	0.82	-1.23
Pain medication	10.66***	14.04	0.54	8.04	-3.26*	16.56	-5.36**	8.04
Feels rested	-6.42***	-8.46	0.98	14.62	3.54***	-17.97	3.65***	-5.47
Controls	0.57	0.75	0.25	3.72	-0.07	0.36	-0.96	1.43

**Source:** American Time Use Survey. Data are weighted with results rounded to the nearest hundredth. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$  (two-tailed tests).

**Note:** % of total decomposition uses observed difference as base; % of detailed decomposition uses explained component as base.

**Table 5. Decomposition of the disability gap in time use for women with and without disability**

	Market work		Nonmarket work		Tertiary activities		Leisure	
	Coefficient	%	Coefficient	%	Coefficient	%	Coefficient	%
<i>Total decomposition</i>								
Observed difference	155.39***	100.00	13.00	100.00	-54.06***	100.00	-127.59***	100.00
Explained component	47.04***	30.27	18.95***	145.81	-14.88***	27.53	-63.80***	50.01
Unexplained component	108.35***	69.73	-5.95	-45.81	-39.18***	72.47	-63.78***	49.99
<i>Detailed decomposition, explained component</i>								
Age	5.00	10.63	-19.50***	-102.92	12.91***	-86.76	-10.91***	17.11
Education	11.60***	24.65	-1.35	-7.10	-4.03***	27.06	-4.78***	7.49
Marital status	-10.25***	-21.80	7.24***	38.18	1.63	-10.98	1.61	-2.53
Presence of children	-12.82***	-27.25	29.42***	155.26	-5.71***	38.40	-7.82***	12.25
Number of household adults	-2.19	-4.65	0.65	3.42	-0.07	0.48	0.61	-0.95
Immigrant	-0.12	-0.26	2.33**	12.31	0.28	-1.88	-2.16**	3.38
Race/ethnicity	0.58	1.23	1.70*	8.99	0.18	-1.23	-2.29**	3.59
Family income	22.54***	47.92	-5.55*	-29.27	-2.48	16.68	-12.74***	19.97
Homeownership	-0.61	-1.30	1.33*	7.01	0.13	-0.87	-1.09	1.71
Other housing type	-0.07	-0.15	-0.90	-4.73	0.18	-1.21	0.18	-0.28
Metropolitan residence	-0.66	-1.40	-0.62	-3.25	0.78	-5.22	-0.29	0.45
Self-rated health	30.40***	64.62	0.81	4.27	-15.17***	101.98	-19.19***	30.07
Hypertension	1.37	2.91	0.80	4.23	0.43	-2.88	-3.07*	4.81
Pain medication	7.42**	15.78	0.81	4.28	-6.52***	43.80	-3.99*	6.26
Feels rested	-5.64***	-11.98	1.87*	9.86	2.52*	-16.92	2.74*	-4.29
Controls	0.49	1.04	-0.10	-0.55	0.07	-0.45	-0.62	0.97

**Source:** American Time Use Survey. Data are weighted with results rounded to the nearest hundredth. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$  (two-tailed tests).

**Note:** % of total decomposition uses observed difference as base; % of detailed decomposition uses explained component as base.

Thus, the total decomposition reflects several aspects of the disability gap in time use: if a gap exists for each activity domain (indicated by the significance of the observed difference), the magnitude of each gap (indicated by the size of the observed difference), and the extent to which included covariates explain each gap (indicated by the percentage of the observed difference accounted for by the explained component).

First, among men and women with and without any disability, a significant observed difference exists across all activity domains except nonmarket work. Second, the largest gap is observed in market time, followed by leisure. Although this suggests that market time is primarily displaced to leisure, a considerable difference also exists in tertiary activities. Finally, among the domains with a significant gap, the covariates included in these models account for the largest percentage of the observed difference in leisure (47.87 percent for men; 50.01 percent for women) and the smallest percentage of the observed difference in tertiary time (37.18 percent for men; 27.53 percent for women). Notably, the explained percentage of the gap in market work and in tertiary activities is larger for men than for women.

The detailed decomposition results indicate how much of the explained component of the disability gap is due to differences in specific predictors, such that all positive and negative coefficients within each activity domain sum to the explained component.<sup>11</sup> When the explained component is positive, predictors with positive coefficients widen the gap and predictors with negative coefficients narrow the gap; the opposite is true when the explained component is negative. Percentages are included next to each predictor to indicate their relative contribution to the explained component; they necessarily sum to 100 percent.<sup>12</sup> The detailed decomposition results for nonmarket work are not discussed because the observed difference is nonsignificant; however, I present them in the tables for consistency.

Included covariates contribute to the explained component in different directions: for men's market work, the positive percentage for self-rated health (36.12 percent) widens the explained component, while the negative percentage for feeling rested (−8.46 percent) narrows it. Next, when making comparisons by type of predictor, income is the primary socioeconomic contributor to the explained component (men 30.42 percent; women 47.92 percent) and leisure (men 19.55 percent; women 19.97 percent) time. The presence of children accounts for 16.44 percent and 9.62 percent (38.40 percent and 12.25 percent) of the explained component of men's (women's) tertiary and leisure time, respectively. Education accounts for more of the explained component for women than for men across activity domains. Among health predictors, self-rated health widens the explained component the most, followed by pain medication. Feeling rested narrows the explained component in all domains.

The relative contribution of health predictors—versus socioeconomic and demographic predictors—can also be assessed, although in some models these comparisons are dependent upon the choice of included covariates. Combined, all health predictors account for 43.73 percent (71.33 percent) of the explained component of men's (women's) market work, 88.01 percent (125.98 percent) of



their tertiary activities, and 34.11 percent (36.85 percent) of their leisure time. Combined, socioeconomic and demographic predictors account for 55.52 percent (27.63 percent) of the explained component of men's (women's) market work, 11.62 percent (–25.53 percent) of their tertiary activities, and 64.46 percent (62.19 percent) of their leisure time. However, in women's market work, combining age (10.63 percent), education (24.65 percent), and income (47.92 percent) accounts for as much of the explained component as combining self-rated health (64.62 percent), hypertension (2.91 percent), and pain medication (15.78 percent). Health predictors clearly account for a larger percentage of the explained component of the tertiary gap than socioeconomic and demographic predictors: self-rated health alone accounts for 82.27 percent among men and 101.98 percent among women.

### ***Supplemental analysis: Disability type***

Appendix Table A presents the distribution of time use and explanatory variables by disability type. Appendix Tables B and C present OLS models, while Tables D and E present decomposition results. Time use patterns largely hold by disability type, with two exceptions: there is no significant disability gap in tertiary activities between men with sensory disability and men without disability, and women with physical disability spend significantly less time in nonmarket work than women without disability. The gaps in market, tertiary, and leisure time are largest among adults with physical disability, followed by those with cognitive and sensory disability. The percentage of the observed difference explained by these covariates is largest for those with sensory disability and generally smallest for those with physical disability for market work and leisure, with a less clear pattern across disability type and gender for tertiary activities.

As in the overall models, combined socioeconomic and demographic predictors account for a larger percentage than combined health predictors of the explained component of the gap in market time for men and in leisure time for men and women. The percentage accounted for by health predictors is similar overall across disability types for leisure (33 percent–38 percent), men's market work (39 percent–46 percent), and women's market work (66 percent–73 percent). As in the overall models, the combined coefficients for health predictors account for more than the combined coefficients for socioeconomic and demographic predictors for women's market work—although this pattern does not hold when only considering age, education, and income versus self-rated health, hypertension, and pain medication. Health predictors account for the largest percentage of the explained component of tertiary activities for all disability types.

## **Discussion**

Although individuals with disabilities experience well-documented social and health disparities, disability remains a largely “overlooked” (Green and Gerschick 2016) axis of inequality in sociology. This study advances the

understanding of disability as inequality by assessing the extent to which health disparities and social disparities contribute to differences in the way people with and without disabilities spend their daily time.

First, results indicate the importance of disentangling disability from health. Net of an array of health characteristics, disability independently associates with the market, tertiary, and leisure time of working-aged men and women in the United States. Many researchers may not recognize the distinction between health and disability, although it is theoretically (Verbrugge and Jette 1994; WHO 2001b) and empirically well established: a review (Krahn, Walker, and Correa-De-Araujo 2015, S198) of differences in health care access, health behaviors, health status, and social determinants of health by disability status concludes that “population-level differences in health outcomes...are related to a history of wide-ranging disadvantages, which are avoidable and not primarily caused by the underlying disability.” Health disparities are disproportionately experienced by people with disabilities, but self-rated health, hypertension, pain medication, and fatigue cannot fully explain the differences in time use observed in this study.

Second, health disparities and social disparities do not uniformly explain differences in time use across activity domains. Health characteristics account for a large part of the gap in health-related time use: tertiary activities including sleep, personal care, and eating and drinking that are necessary to maintain function. Otherwise, depending on the choice of predictors, socioeconomic and demographic characteristics explain as much or more of the gap in market and leisure time use. This pattern holds for men and for women, and when restricting analyses to include only those with a sensory, cognitive, or physical disability. Health characteristics are important—but not the only, or the most important—contributors to differences in the way people with and without disabilities spend their daily lives.

Third, except among women with physical disability, disability does not associate with time spent in nonmarket work in this sample, indicating that focusing solely on people with disabilities’ market engagement neglects their substantial contributions to productivity outside the market (Shandra 2016). Results reiterate the need to more critically define the concept of “work” among populations who experience barriers to formal labor market participation.

Theoretically, these patterns align with the hybrid model of disability, which recognizes the role of both health conditions and social factors in the experience of disability. But results also illustrate how much remains unexplained: included predictors account for only 28–50 percent of the disability gap across models. Longitudinal information about health, impairments, and participation barriers among working-aged adults would likely increase explanatory capacity. Until these data are available, researchers interested in understanding how time use (and social participation, more broadly) is patterned should consider disability as an explanatory factor: Statistically, disability status operates independently from health and sociodemographic factors and uniquely identifies individual differences in activity participation. Substantively, disability information is

available in many national datasets (Livermore et al. 2011) and has the potential to promote more inclusive population research.

## Limitations

The ATUS is the only contemporary, nationally representative data source in the United States that allows for the opportunity to understand daily time use among working-aged people with disabilities. However, several potential limitations should be recognized. First, the ATUS contains a finite amount of information on health. The four respondent-level general health measures included in the Well-Being Modules include one pain item (if the respondent took pain medication on diary day) and three health status questions (if the respondent had been diagnosed with hypertension by a health professional, felt well rested on diary day, and self-rated health) (Downey 2009). Self-rated health has been frequently utilized in the ATUS (Jonas, Ibuka, and Russell 2011; Moen and Flood 2013; Podor and Halliday 2012), in time use data from other countries (Pagán 2013; Strazdins et al. 2016), and from cohorts of older adults in the United States (Carr et al. 2014, 2016). Thus, much of what is known about general health and time use comes from self-reports. In these models, self-reported health explains the largest proportion of the explained component of the disability gap, relative to other included health characteristics.

Self-rated health as an indicator is not without its critiques. Questions remain about what is measured (Huisman and Deeg 2010; Jylhä 2009), with evidence that individuals from different population groups evaluate their health differently (Dowd and Zajacova 2007; Zajacova and Dowd 2011). Drum, Horner-Johnson, and Krahn (2008) find that—within the same category of self-rated health—people with disabilities report significantly more days of poor physical health and poor mental health and fewer healthy days than people without disabilities. This suggests that people with and without disabilities may have different processes for constructing health self-ratings. Additionally, Tate, Kalpakjian, and Forchheimer's (2002) research on self-rated health among individuals with spinal cord injury (SCI) found that 51 percent always interpreted health as including the effects of their SCI, while 21 percent never did. Thus, health is confounded with function for some, but not all, individuals with disabilities. Krahn et al. (2009) provide a comprehensive overview of these and other potential issues in measuring perceived health status in the context of disability.

The implication may be that self-assessments of health are noisier among those with disabilities than among those without disabilities (although see Horner-Johnson et al. [2010]). The data to assess these potential issues are not available in the ATUS, nor is it clear how a loss of measurement precision might affect trends in time use among individuals with disabilities. However, additional indicators allow for a more expansive measurement of general health: fatigue and pain are established secondary health conditions (Kinne, Patrick, and Doyle 2004; Rimmer, Chen, and Hsieh 2011), and there is a high level of agreement between self-reported hypertension and medically recorded or measured hypertension (Okura et al. 2004; White et al. 2012). Likewise, bivariate

correlation coefficients between self-rated health and these other indicators range from 0.24 (well rested) to 0.31 (hypertension), suggesting they measure distinct components of health status. Their inclusion in all models represents the most comprehensive consideration of respondent-level health possible with these data.

A second limitation is that the ATUS is cross-sectional and relies on the CPS definition of functional limitations as a disability indicator (see [Brault et al. \[2007\]](#) for the evaluation report on the development of these measures and [Altman \[2014\]](#) and [Burkhauser, Houtenville, and Tennant \[2014\]](#) for critiques). Results are correlational and should be interpreted as such. Longitudinal information on time use that includes multiple measures of health and disability would be ideal for assessing temporal effects on participation across activity domains. It would be especially useful to disentangle age of disability onset from educational, employment, and family histories. Although such a data source is not currently available for working-aged adults, the Disability and Use of Time supplement of the Panel Study of Income Dynamics ([Freedman and Cornman 2012](#)) contains multiple repeat measures that may overcome some of these limitations among a sample of older adults.

## Implications and Future Directions

One implication of these results is methodological: health, socioeconomic, and demographic characteristics are major contributors to—but insufficient predictors of—variation in time use by disability status. Another implication is substantive: like other forms of stratification, disability is associated with disparate resources that further condition lived experiences.

How, then, do sociologists situate disability within broader analyses of inequality? It could be argued that this question is no different than the question of how to situate race, class, or gender within analyses of inequality. It could also be argued that relegating the answers to the periphery of the discipline ([Green and Barnartt 2016](#)) is as problematic as if we were to relegate scholarship on race, class, and gender there. With these issues in mind, the results suggest multiple opportunities for future research.

The first is about gender—both how women with disabilities compare to men with disabilities and how women (men) with disabilities compare to women (men) without disabilities. For example, the magnitude of the education and presence of children coefficients is larger for women with disabilities than for men with disabilities in most OLS models. Similarly, education, marital status, and the presence of children account for a larger percentage of the explained component of the gap (either widening or narrowing) for women than for men. Differences in results by disability status in this study, as in others ([Carr, Cornman, and Freedman 2017](#); [Pettinicchio and Maroto 2017](#)), vary by gender. However, the understanding of how disability might condition gendered time use patterns among working-aged adults—across detailed types of housework, child care, leisure, and health behaviors—remains more limited ([Anand and Ben-Shalom 2014](#); [Shandra and Penner 2017](#)).

Second, in aging. An estimated one-fourth of workers will experience disability by retirement age ([Social Security Administration 2017](#)), with patterns of social participation among those with disability varying across the life course ([Verbrugge and Yang 2002](#)). In these models, age is a significant contributor to disability gaps across activity domains. Understanding how disability associates with daily time use, conditional on age, would be a fruitful extension. Similarly, participation patterns associate with people with disabilities' experienced well-being in data on older couples ([Freedman et al. 2017a,b](#)), but are less understood among young and midlife adults.

Third, leisure—the domain in which women and men with disabilities spend over six and seven hours per day, respectively. Leisure is both about quantity and about quality. This can include type of leisure, such as if the activity was passive (like television), social (such as going out with friends), or active (involving physical or mental engagement). It can also describe the arrangement of leisure time, including whether leisure is the primary activity, spent in isolation, or fragmented by other tasks. Since these characteristics are associated with varying benefits, leisure time has also been used as an indicator of inequality between population groups ([Passias, Sayer, and Pepin 2017](#); [Sevilla, Gimenez-Nadal, and Gershuny 2012](#)). It may be that people with disabilities experience more—but lower-quality—leisure activities than people without disabilities.

Finally, in time trade-offs. [Oi \(1991\)](#) hypothesized that disability diverts time from market work because of the increased time necessary for health-related activities. Yet, results from this study do not indicate a perfect trade-off between people with disabilities' productive and consumptive activities. Analyses that can disentangle which types of background characteristics (especially employment, family structure, education, and health) facilitate which types of trade-offs can further elucidate constraints to daily participation. Tools such as sequence analysis would be useful for this, as would attention to the time of day when activities are performed ([Hellgren 2014](#)). Similarly, analyses that consider who is (or is not) present during daily activities would provide greater knowledge of social support and isolation. The established (and expanding) literature on time use as a marker of inequality for other populations can serve as a template for how to start answering these questions for people with disabilities.

## Notes

1. See [Mezey \(2005\)](#) for a discussion of Supreme Court interpretations limiting the scope of the law, [Schur et al. \(2017\)](#) for a review of employment issues, and [Bezyak, Sabella, and Gattis \(2017\)](#) for a study of transportation barriers.
2. Other models of time allocation distinguish between market production, nonmarket production, and leisure ([Ås 1978](#); [Gershuny 2011](#); [Gronau 1980](#)). The four domains described here follow previous work by [Pagán \(2013\)](#) and have the advantage of differentiating between leisure and the personal care-related activities inherent in tertiary time use.
3. More comprehensive discussions of the differences and similarities inherent in these approaches are available from [Masala and Petretto \(2008\)](#) and [Green and Barnartt \(2016\)](#).

4. These provisions established that—among eligible employers—job discrimination by disability status is illegal, and employers must assume the cost of providing reasonable accommodation to permit employees with disabilities to perform essential job functions. Oi's chapter appeared in an edited volume about the implications of this policy for businesses, consumers, and workers.
5. The ICF's environmental factors include physical, social, and attitudinal characteristics that may hinder or facilitate participation. The ATUS lacks data on many of these barriers. However, coresident partners and household children—the presence of which positively associates with social capital (Alvarez, Kawachi, and Romani 2017; Ravanera and Rajulton 2010)—are included here to measure residential family relationships. Residence in a metropolitan statistical area measures urbanicity, which conditions access to transportation and other services (Glennie et al. 2017; National Council on Disability 2005). Measures of household poverty are unavailable for most respondents in this sample; however, all models consider homeownership and housing type.
6. Households are administered the CPS in a 4-8-4 rotating design, meaning the same households are interviewed monthly for four successive months, then not interviewed for eight successive months, then interviewed for another four successive months. Households are asked disability questions when they enter the survey for the first time and when they re-enter the survey after the eight-month break. In addition, disability questions are also asked about new household members (BLS 2015). Disability status as measured in the CPS does change over time (Ward et al. 2017). However, other analyses indicate the CPS measure underrepresents individuals with disabilities (Burkhauser, Houtenville, and Tennant 2014; Ipsen et al. 2017), suggesting these are conservative estimates of the population.
7. All eligible respondents who respond affirmatively to having a sensory ( $N = 590$ ) or cognitive ( $N = 713$ ) or physical limitation ( $N = 1,293$ ) are included in each respective disability group, while the reference category is consistently defined as “no disability” ( $N = 24,263$ ).
8. Setting the reference category to “excellent” or “poor” resulted in high VIFs in the disabled and non-disabled samples, respectively—unsurprising given the small number of cases in these groups. Patterns are similar in OLS results regardless of base category, and models are specified such that the chosen reference category has no effect on decomposition results (see Jann [2008] for details).
9. Although they are largely nonsignificant across models, housing type, homeownership, and metropolitan residence are included as correlates of environmental factors (see note 5). Trimmed models excluding these measures produce comparable results.
10. The general Oaxaca-Blinder approach can be specified as follows, such that the first term on the right-hand side of Equation 1 represents the explained component, and the second term represents the unexplained component:

$$\bar{Y}_A - \bar{Y}_B = (\bar{X}_A - \bar{X}_B)\hat{\beta}_A + \bar{X}_B(\hat{\beta}_A - \hat{\beta}_B) \quad (1)$$

Results from this general approach, however, are dependent upon the choice of reference category, such that it is also possible to specify the decomposition using the alternative:

$$\bar{Y}_A - \bar{Y}_B = (\bar{X}_A - \bar{X}_B)\hat{\beta}_B + \bar{X}_A(\hat{\beta}_A - \hat{\beta}_B) \quad (2)$$

Thus, I follow Jann (2008) in specifying that the coefficients from a pooled model over both disabled and non-disabled groups are used as the reference coefficients, with the pooled model including an indicator of disability group membership.

11. Focusing on men's market work, for example, the values in the coefficient column (9.03 through 0.57) sum to 75.91. In this manner, it is mathematically possible for predictors that widen the gap to be offset by predictors that narrow it.
12. I utilize the explained component as the denominator to illustrate the relative size of each coefficient's contribution, but conclusions regarding the relative size of coefficients would have been the same using the total observed difference as the denominator.

## About the Author

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## Supplementary Material

Supplementary material is available at *Social Forces* online.

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