Stigmatizing Built Environments and Mobility-Disabled People's Labor Integration

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Abstract

Stigmatizing attitudes prevent mobility-disabled people, including those who use wheelchairs, from engaging in community settings. Community and environmental psychologists call this engagement *community integration*, of which engagement in work settings (i.e., labor integration) is a part. Disability research also indicates that built environments, or human-made spaces, reduce mobility-disabled people's integration directly, and might do so indirectly by promoting stigmatizing attitudes against them. Previous work argues that built environments influence attitudes about disabled people through the possibilities for action, or affordances, that they offer. Recent evidence suggests that distinct aspects of built environments, like a community's housing stock or transit system, do not influence disability stigma as a uniform collection (i.e., landscape) of affordances. However, those pieces might still promote stigmatizing attitudes against mobility-disabled people individually. Together, these ideas imply four theoretical relationships: 1) community affordances reduce labor integration among mobility-disabled people by failing to accommodate them; 2) stigmatizing attitudes against mobility-disabled people reduce their labor integration; 3) affordances that fail to accommodate mobility-disabled people promote stigmatizing attitudes against them, and; 4) affordances reduce the integration of mobility-disabled people *through* the attitudes they produce. In the current study, I test the third and fourth propositions quantitatively for the first time and complement existing evidence for the first two. I also attempt to determine the extent and directions of community-level relationships between demographic features and disability stigma. Results provided several takeaways. First, coherent landscapes of affordances seem to be few and far between in American cities. Second, a community's level of disability stigma may impede mobility-disabled people's access to local work opportunities, causing them to rely more heavily on income assistance from the Social Security Administration. Finally, factors associated with implicit disability stigma among individuals may not predict that stigma at the community level.

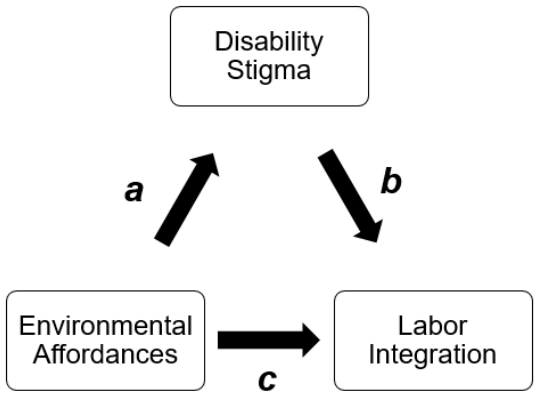
Keywords: stigma, mobility-disabled people, labor integration

Introduction

According to Link and Phelan (2001), stigma manifests partly through people's attitudes. Research suggests that these attitudes prevent mobility-disabled people, including those who use wheelchairs, from engaging in community settings. Community and environmental psychologists call this engagement *community integration*, of which engagement in work settings (i.e., labor integration) is a part (Kweon et al., 1998; Terry & Townley, 2019; Townley et al., 2009; Ware et al., 2007; Wong & Solomon, 2002). Psychological studies show relationships between disability stigma and individual factors like stigmatizing person's age and sex, indicating that these factors might influence labor integration through disability stigma (Harder et al., 2019; Nosek et al., 2007). Unfortunately, because they focus on individuals, these studies cannot show how to influence a community's *overall* degree of disability stigma (Snijders & Bosker, 2012). For example, the fact that individual women exhibit less disability stigma does not necessarily indicate that mobility-disabled people will experience less stigma in communities with more women.

Disability research also indicates that built environments, or human-made spaces, reduce mobility-disabled people's integration directly, and might do so indirectly by promoting stigmatizing attitudes against them (Garland Thomson, 2011; Hamraie, 2017; Imrie, 2003). Previous work argues that built environments influence attitudes about disabled people through the possibilities for action, or affordances, that they offer (Glendening, under review). Recent evidence suggests that distinct aspects of built environments, like a community's housing stock or transit system, do not influence disability stigma as a uniform collection (i.e., landscape) of affordances (Glendening, in progress). However, those pieces might still promote stigmatizing attitudes against mobility-disabled people individually. Together, these ideas imply the four theoretical relationships shown in Figure 1: 1) community affordances reduce labor integration among mobility-disabled people by failing to accommodate them (path *c*); 2) stigmatizing attitudes against mobility-disabled people reduce their labor integration (path *b*); 3) affordances that fail to accommodate mobility-disabled people promote stigmatizing attitudes against them (path *a*), and; 4) affordances reduce the integration of mobility-disabled people *through* the attitudes they produce (path *ab*). In the current study, I test the third and fourth propositions quantitatively for the first time and complement existing evidence for the first two. I also attempt to determine the extent and directions of community-level relationships between demographic features and disability stigma.

Figure 1. *Relationships Between Environmental Affordances, Disability Stigma, and Labor Integration*



Labor Integration

The concept of community integration, as community and environmental psychologists understand it, emerged from mental health research. According to Wong and Solomon (2002), this concept has three dimensions. Physical integration refers to people's access to the spaces, activities, and resources in their communities. Social integration denotes people's opportunities to interact with community members and form social networks. Finally, psychological integration reflects people's perceived membership in, emotional attachment to, and influence over their communities. Benefits of community integration include improved mood, increased subjective well-being, and reduced post-traumatic stress (Fothergill et al., 2011; Herrero et al., 2011; Okech et al., 2018).

However, communities often fail to provide the benefits of community integration to mobility-disabled people. For example, mobility-disabled people seeking work frequently struggle to access employment in their communities. In 2019, 78.6% of America's non-disabled, working-aged civilians reported employment (Paul et al., 2020a). In contrast, only 26.2% of their mobility-disabled peers were employed. In general, disabled people who obtain a job are still less likely to stay employed, get promoted, or work full-time (Brucker & Houtenville, 2015; Meyer & Mok, 2019; Mitra & Kruse, 2016; Schur, 2003; Wilson-Kovacs et al., 2008).

A reasonable person could argue that disconnecting from normative work patterns has benefits, especially for people whose bodies and minds refuse to fit capitalist schedules (Kafer, 2013). However, studies show that most mobility-disabled people want to work and get satisfaction from their jobs (Ali et al., 2011; Saunders & Nedelec, 2014). In addition, work disparities cause material harm to mobility-disabled people and their households. Whereas 9% of community-dwelling, non-disabled people lived below the poverty line in 2019, 21% of mobility-disabled people did so (Paul et al., 2020b). Thus, understanding and removing physical and social barriers to labor integration could improve the lives of many mobility-disabled people.

Barriers to Labor Integration

Built Environments

Disability theorists argue that built environments physically prevent mobility-disabled people from using workplaces and other community settings that support employment (Garland Thomson, 2011; Hamraie, 2017; Imrie, 2003). Research by community and environmental psychologists supports this argument (Fawcett et al., 1994; White, 1992). For example, a literature review by Prescott et al. (2020) found that inadequate travel surfaces, missing curb ramps, narrow or stepped pathways, and uncontrolled crosswalks prevent, or *dis*afford community travel for mobility-disabled people. Using experimental and participatory designs, other studies find that affordances influence opportunities for wheelchair users to leave their homes and enter government facilities that might support their employment (Aldersey et al., 2018; McDonald et al., 2015; White et al., 1995). Surveys in the US, Saudi Arabia, and Turkey indicate that stairs and poorly maintained sidewalks prevent mobility-disabled people from participating in community and religious organizations (Akyuz et al., 2014; Hoenig et al., 2003; Meyers et al., 2002; Tariah et al., 2018; Yang & Sanford, 2012). As Granovetter (1973) notes, connections made in these organizations can be vital for job-seekers. Finally, interviews and focus groups in several countries link stairs, inaccessible sidewalks, unpaved roads, broken or missing elevators, narrow doorways, and desks built for standing individuals to reduced work and recuperative leisure (Akyuz et al., 2014; Banda-Chalwe et al., 2014; Barker et al., 2006; Dorjbal et al., 2020; Levins et al., 2004; Östlund & Johansson, 2018; Reid et al., 2003; Rimmer et al., 2004; Rosenberg et al. 2013; Rossen et al., 2012; Rudman et al., 2006; Vergunst et al., 2015).

Stigma

Research from at five continents identifies stigma as one barrier to employment for mobility-disabled people. For example, interviews and focus groups in the US, the UK, Zambia, Turkey, Mongolia, and Australia revealed that stigmatizing attitudes reduced employment for mobility-disabled people and limited their access to resources needed to maintain jobs. The latter included social connections, education, and reliable transportation (Banda-Chalwe et al., 2014; Barclay et al., 2016; Dorjbal et al., 2020; Fawcett et al., 1994; Hammel et al., 2015; Velho, 2019; White, 1992). Aldersey et al. (2018) used participatory action research to obtain similar results in Bangladesh. There, wheelchair users cited pity and low expectations from family and community members as barriers to employment.

In addition to these mostly qualitative projects, several quantitative studies have connected stigma to mobility-disabled people's low rate of employment. Field experiments in Canada and Norway found that disclosing wheelchair use on a job application significantly reduced a person's odds of securing an interview (Bellemare et al., 2019; Bjørnshagen & Ugreninov, 2021). Likewise, a longitudinal survey of wheelchair users in two American cities identified rude community members as major barriers to accessing workplaces and other destinations (Meyers et al., 2002). Stigma's role in denying labor integration to mobility-disabled people highlights a need to understand and engage with the factors that support it. Research with individuals suggests that implicit disability stigma decreases with liberalism and contact with disabled people but is higher among men and older individuals (Harder et al., 2019; Nosek et al., 2007). However, it is not clear that *communities* whose residents are, for example, older or more conservative on average also exhibit more stigmatizing attitudes toward mobility-disabled people. This limits any intervention designed to reduce stigma, which works through communities as much as it does through individuals (Cook et al., 2014).

Connecting Affordances to Stigma Through Misfit

If both stigma and the affordances embedded within built environments can prevent mobility-disabled people from working, it is necessary to understand how these forces relate to one another. Garland Thomson (2011) coined the term *misfit* to describe the mismatch between a built environment's affordances and the people who encounter them. Critical theorists, including Garland Thomson, argue that built environments maintain stigma against disabled people by misfitting them (Constanza-Chock, 2020; Garland Thomson, 2011; Hamraie, 2017; Hendren, 2020; Imrie, 2003). For example, most designers in a society that systematically devalues mobility-disabled people (McRuer, 2006) will not imagine them as users. Instead, they will rely on implicit guidelines that assume users will not have disabilities or other stigmatizing features. Hamraie (2017) calls these guidelines the *normate template of design*.

Because the built environment's other users live in the same society as the designer, those users' default ideas about bodies will also stigmatize mobility-disabled people. By misfitting mobility-disabled people, spaces leave this understanding intact. In contrast, a built environment that fit mobility-disabled people would subvert the expectations of non-disabled people, leading them to actively consider the former's claims to space. In this way, built environments can either maintain or challenge stigma against mobility-disabled people. However, the ability of a single affordance to influence this stigma is limited. Ramstead et al. (2016) claim that people negotiate stigmatizing cultural expectations through immersion in *landscapes of affordances*, or total collections of possible actions in their environments (Rietveld & Kiverstein, 2014). That is, relationships between stigma and affordances may develop at the community level.

To review, theory implies that societies with a preference for non-disabled bodies maintain stigma against mobility-disabled people through collections of affordances that misfit them. In contrast, landscapes that fit mobility-disabled people disrupt this process. Evidence that stigma limits labor integration for mobility-disabled people indicates that accessible built environments might promote their integration by reducing disability stigma. Ramstead et al.'s (2016) work indicates that this process could occur at the community level, implying that community-wide changes to affordances that misfit mobility-disabled people can both support their labor integration and reduce stigma against them. Alternatively, communities with less stigmatizing attitudes toward mobility-disabled people may produce built environments that support their integration by fitting their bodies.

The Current Study

The sections above indicate direct relationships between: 1) environmental affordances and labor integration for mobility-disabled people, and; 2) stigmatizing attitudes against mobility-disabled people and their labor integration. They also imply relationships between: 3) affordances and stigmatizing attitudes, and; 4) affordances and labor integration *through* stigmatizing attitudes. Previous studies provide qualitative evidence for the first two relationships, largely relying on descriptions of individual experiences. A study using quantitative, inferential methods to measure affordances, stigma, and integration at the community level would complement their findings. Although the last two relationships remain untested empirically, they have important implications. Theoretically, these relationships suggest that affordances misfitting mobility-disabled people place upper limits on the ability of legal and educational interventions to reduce stigma against them and support their integration. Practically, they suggest that legislators could reduce stigma against mobility-disabled people by requiring the infrastructure under their authority to meet stronger accessibility standards. However, this assumes that built environments influence stigmatizing attitudes rather than simply reflecting them. The current study considered four directional hypotheses:

1. Mobility-disabled people experience less labor integration in metropolitan areas where affordances misfit them.
2. Mobility-disabled people experience less integration in areas where non-disabled people hold more stigmatizing attitudes toward them.
3. Non-disabled people hold more stigmatizing attitudes toward mobility-disabled people in areas where affordances misfit the latter.
4. Stigmatizing attitudes mediate associations between affordances and mobility-disabled people's integration, if such associations exist.

In addition to these directional hypotheses, I also examined: 1) whether or not variables that are associated with disability stigma at the individual level are associated at the community level, and; 2) the directions these relationships take.

Methods

Data Sources and Measures

For this study, I measured transit, sidewalk, and housing affordances with data from the National Transit Database, Google Street View, and the American Housing Survey, respectively. The Current Population Survey and Project Implicit provided measures of labor integration and

disability stigma, respectively. I also obtained covariates from Project Implicit, a non-profit organization that collects and shares data on attitudes toward different groups of people.

To measure transit affordances, I used 2011 data from the National Transit Database. Using weighted averages, I determine the percentage of each metropolitan area's transit stations and vehicles that accommodated wheelchair users. I measured sidewalk affordances by virtually auditing the accessibility of each metropolitan area's sidewalks using 2013 images from Google Street View. Using data from the US Census Bureau, I sampled 25% of census tracts in each of the 195 metropolitan areas in this study. Next, I randomly sampled 25% of street segments within each tract. McMillan et al. (2010) show that this sampling rate produces accurate measures of built environments at the neighborhood scale, which census tracts approximate.

Finally, I audited each segment of sidewalk with the Pedestrian Environmental Data Scan (Clifton et al., 2007). This instrument measures whether a sidewalk is: present; made of accessible materials; sloped at a manageable level; obstructed; separated from traffic by a buffer; continuous; connected to other sidewalks or crosswalks; equipped with curb cuts; and free from bumps, cracks, and holes. Using this instrument, I created a scale from zero (no sidewalk) to nine (wheelchair accessible sidewalk), which I then averaged at the metropolitan level. Agreement between raters using the Scan's protocol materials ranges from 60-100% for the items I used, with kappa scores indicating fair to perfect agreement (Clifton et al., 2007; McHugh, 2012). To measure the reliability of my sidewalk scores, I recoded 1 in 50 street segments and used concordance correlations to compare new scores to their originals. Lin (1989) recommends this method for continuous variables. Concordance coefficients range from 0 to 1, with higher scores indicating complete agreement between measurements. The reliability of my sidewalk measurements was 0.91, or 'good' by the standard applied by Clifton et al. (2007).

I relied on data from the 2011 American Housing Survey for this study's measure of housing affordances. That year the survey asked whether the following housing features accommodate wheelchair users: front entrances; electrical outlets; electrical switches; kitchen cabinets; climate controls; bathrooms; kitchens, and countertops. Using these items, I created a scale measuring each housing unit's wheelchair accessibility from zero (no accessible features) to eight (all accessible features). I then averaged household scores on this scale at the metropolitan level. Although household accessibility questions offered data needed for the current study, the American Community Survey included them only in 2011. As a result, I obtained all data in the current study from the years 2011-2013, even when more recent data existed. Although this dates the study to an unusual degree, it allowed me to maintain a sound design. Also, because literature suggests that my study's relationships remain stable over long periods of time, findings from 2011-2013 remain relevant in 2022.

The 2013 Current Population Survey provided the current study with two measures of labor integration. The Current Population Survey is a monthly survey conducted by the US Census Bureau and sponsored by the Bureau of Labor Statistics. Using a probability sample of approximately 60,000 occupied housing units, surveyors collect telephone and in-person data on the demographic and labor characteristics of each unit's residents. In addition, Current Population Survey staff often collect supplemental data needed by labor market analysts. I measured labor integration by calculating: 1) the percent of mobility-disabled people in each metropolitan area's labor force that reported being employed, and; 2) the mean number of hours worked per week by mobility-disabled people reporting employment.

Data on disability stigma derived from Project Implicit. Because research participants are less willing to share attitudes that they believe are socially unacceptable (Antonak & Livneh, 2000), Project Implicit measures implicit attitudes, or automatic and unconscious mental reactions to stimuli (Prestwich et al., 2008). They accomplish this using the Implicit Association

Test (Greenwald et al., 1998), a computer-based test that measures implicit attitudes validly and reliably when aggregated across participants (Cunningham et al., 2001; Egloff & Schmukle, 2002; Greenwald & Nosek, 2001). The Implicit Association Test scores how quickly and accurately a person can match two groups of attributes (e.g., good and bad) with two identity groups (e.g., Black and White) (Lane et al., 2007). Matching positive attributes to one identity group more quickly and accurately than the other indicates that a test-taker unconsciously connects the first group to positive attributes more easily (Lane et al., 2007). This further indicates an implicit preference for the first group.

The Implicit Association Test begins by pairing each group of attributes with an identity group and assigning a computer key to each pair. It then instructs participants to press each key as quickly as possible when its assigned attribute or identity group appears on a computer screen. After performing this task several times, the test switches the pairings and participants repeat the activity. Following the second pairing, participants receive an implicit bias score indicating the extent to which they favor one group over the other. This score reflects the participant's tendency to pair a favored group with positive attributes more often and more quickly.

The current study used 2011 and 2012 data from the Disability Attitudes Implicit Association Test, which measures attitudes toward disabled and non-disabled people by associating positive and negative words with two sets of images. One set features people walking, running, and skiing, whereas the other features images invoking visual and mobility disabilities. I used 2012 test data to compute metropolitan-level measures of disability stigma from the individual scores of each metropolitan area's respondents. Project Implicit researchers created these scores by comparing the accuracy of participants' responses during the two parts of their tests and the speed of those responses in milliseconds. Metropolitan areas chosen for the current study had between 20 and 890 respondents.

I obtained the current study's demographic measures from several sources. I used 2011 data to measure the percent of test-takers in each area who had a disabled friend or family member. Data from the 2011 American Community Survey provided measures of each metropolitan area's median age and percentage of residents identifying as female. Each year, the US Census Bureau distributes this survey to more than 3.5 million households. Its results provide timely, detailed, and nationally representative data on the characteristics of the US population. Finally, records from the Massachusetts Institute of Technology's Election Lab provided my measure of community-level liberalism. Specifically, these records indicated the percent of each metropolitan area's voters who selected Barack Obama in the 2012 presidential election.

Analyses

I began preliminary analysis by using intraclass correlations to calculate the degree to which variables aggregated from individual data varied within and between metropolitan areas. The scale for an intraclass correlation ranges from zero to one, with scores approaching one indicating more similarity within groups and less between them. Researchers generally recommend using higher-level measures (e.g., metropolitan areas) for correlations of at least 0.10. These indicate that variables at one level of analysis (e.g., individuals) cluster too tightly within groups at a higher level to ignore that clustering (e.g., Shrout, 1998). In my planned sample of 195 metropolitan areas, disability stigma's correlation reached 0.08. This indicated that some areas had too few tests of disability stigma to form a community-level variable. However, removing these areas from my analyses would also reduce their statistical power. In order to balance the needs of correlations and sample size, I compared changes to both across the inclusion thresholds featured in Table 1. This led me to conduct my analyses in 143 metropolitan areas with at least 20 implicit association tests.

Table 1. Number of Metropolitan Areas and Intraclass Correlations for Disability Stigma When Requiring Different Numbers of Implicit Association Tests Per Site

Number of Tests	Sample Size	Intraclass Correlation
10	195	.08
20	143	.15
30	113	.18
40	91	.22
50	78	.22
60	68	.26
70	59	.26
80	50	.28
90	48	.30
100	46	.24

Controlling for covariates, I next conducted a series of regression analyses to examine hypotheses 1-3. I used the full information maximum likelihood method to account for missing housing data in 6% of metropolitan areas (Graham, 2003). I tested hypotheses 1 and 2 by regressing measures of labor integration on each measure of affordances and disability stigma. Next, I examined hypothesis 3 by regressing disability stigma on each measure of affordances.

Depending on results from hypotheses 1-3, I intended to test hypothesis 4 in two stages. Controlling for covariates, I would first regress labor integration on housing, transit, and sidewalk affordances without controlling for disability stigma. Next, I would test the indirect relationships between each set of affordances and integration by subtracting beta coefficients in a model including stigma from those in a model not including stigma. Preacher and Hayes (2004) indicate that this difference equals the multiplied effect of the relationships between affordances and disability stigma and between stigma and integration. Finally, I would test the resulting difference for significance at $p < .05$ using a two-tailed *t*-distribution. Following Preacher and Hayes (2004), I would use Sobel's test and a bootstrap procedure to test each mediation model. This involves drawing 5,000 random samples from my list of metropolitan areas, obtaining an average mediation estimate across samples, and testing that average for significance. Using this method reduces the number of cases needed to detect mediation to less than 50 because it does not assume a normal sampling distribution (Preacher & Hayes, 2004).

Theoretically, I expected the relationships examined in this study to be causal, with improved affordances for mobility-disabled people increasing labor integration by reducing stigma. However, the correlational data that I used cannot demonstrate causality. Therefore, planned to repeat hypothesis 4's analyses with affordances and stigma reversed to explore an alternative pathway between stigma and integration through affordances. This model suggests a strategy of intervention focused on attitudes rather than built environments. Although the non-nested nature of the competing mediation models would prevent me from testing the superiority of one over the other, results would offer descriptive supplements to other analyses.

Results

Table 2 shows intraclass correlations for variables in 143 metropolitan areas. These areas had a median population of 625,039, and an average of 50.8% of their residents identified as women in 2011. On average, 80.8% identified as White, 7.9% as Black, 8.1% as Hispanic or Latino, 3.0% as Asian, American Indian, or Pacific Islander, and 4.6% as another race or multiple races. The median age was 36 and the annual median household income was $50,009 in

2011 dollars. Finally, Barack Obama's average share of presidential votes in 2012 was 50.3%. This figure ranged from 9.8% in Provo, Utah, to 75.4% in San Francisco, California. No measure of affordances had a significant relationship with any other in the final sample.

Table 3 shows the results of regressing labor integration among an area's mobility-disabled people on affordances and disability stigma. Contrary to hypothesis 1, affordances were not associated with people's rates of employment or the number of hours they worked each week. Consistent with hypothesis 2, mobility-disabled people had lower employment rates in metropolitan areas with more disability stigma. Those who were employed also worked marginally fewer hours in areas with more stigma. Finally, mobility-disabled people had marginally lower employment rates in areas with higher median ages. Table 4 shows the results of regressing stigma on affordances and community characteristics. Contrary to hypothesis 3, an area's affordances were not significantly related to disability stigma among its residents.

Table 2. *Intraclass Correlations Across 143 Metropolitan Areas*

Variables	*ICC*	*95% CI*
Contact	0.24	0.22, 0.26
Housing	0.70	0.69, 0.71
Transit	0.58	0.57, 0.59
Sidewalks	0.85	0.83, 0.87
Stigma	0.15	0.13, 0.17
Employment	0.55	0.54, 0.56
Hours Worked	0.45	0.44, 0.46

Table 3. *Regressing Employment and Work Hours of Mobility-Disabled People on Affordances and Disability Stigma in 143 Metropolitan Areas*

	Employment (%)		Hours Worked (*M*)	
Model	*B*	*SE*	*B*	*SE*
Age	**-0.20†**	**0.11**	-0.13	0.11
Female	0.15	0.11	0.08	0.11
Liberalism	0.07	0.10	0.13	0.10
Contact	0.05	0.09	0.03	0.10
Housing	0.09	0.11	0.18	0.12
Transit	0.13	0.08	0.01	0.09
Sidewalks	-0.05	0.10	-0.03	0.10
Stigma	**-0.20***	**0.08**	**-0.16†**	**0.09**

Notes. †$p < .10$. *$p < .05$. All coefficients standardized. Employment rate calculated for individuals in the labor force. Work hours calculated for employed individuals.

Table 4. *Regressing Disability Stigma on Affordances in 143 Metropolitan Areas*

	Disability Stigma	
Model	*B*	*SE*
Age	-0.12	0.10
Female	0.09	0.10
Liberalism	0.04	0.10
Contact	-0.01	0.09
Housing	-0.08	0.12
Transit	0.09	0.08
Sidewalks	0.03	0.09

Notes. All coefficients standardized.

After removing disability stigma from the model, the relationship between a metropolitan area's median age and the employment rate of its mobility-disabled residents disappeared. However, mobility-disabled people who were employed worked more hours in areas with more accessible housing. Hypothesis 4 predicted that disability stigma mediated relationships between labor integration and environmental affordances. I also proposed an alternative hypothesis in which affordances mediated the relationship between stigma and integration. However, neither disability stigma nor affordances significantly mediated any of the relationships in these analyses. Because a variable arguably cannot mediate a relationship that does not exist, I do not show results for hypothesis 4 or discuss them in the next section.

Discussion

Hypotheses 1 and 2

Hypothesis 1 predicted that mobility-disabled people would integrate less into workplaces where community affordances misfit their needs. Affordances were not associated with either employment rates or the number of hours worked each week by mobility-disabled people. Although housing accessibility was marginally associated with increased work hours in one model, this relationship disappeared in a model that included disability stigma. Similarly, the finding that mobility-disabled people had marginally lower employment rates in areas with older residents disappeared when I removed disability stigma from the model. Because these associations were weak and unstable, it is inappropriate to interpret them here.

Consistent with hypothesis 2, disability stigma was significantly related to employment and marginally related to work hours. These findings are consistent with studies reporting negative relationships between stigma and work for mobility-disabled people (Hammel et al., 2015; Rudman et al., 2006). Regarding work hours, employers may place mobility-disabled workers in jobs with less predictable schedules. For example, Kaye (2009) finds that employers' stereotypes lead them to overlook mobility-disabled workers for steady positions requiring information and communication skills. Alternatively, experiencing stigma from employees and coworkers may encourage mobility-disabled people to spend less time at work. The finding that stigma reduces work for mobility-disabled people bears importance for the Social Security Administration. Mobility-disabled people receive a large portion of benefits offered by Supplemental Security Income and Social Security Disability Insurance. Those who find steady jobs with opportunities for advancement increase their material security while also reducing the Social Security Administration's programmatic costs. By reducing stigma, the Administration satisfies both the prosperity of its beneficiaries and its mandate for fiscal responsibility.

Hypothesis 3

Disability stigma was not related to any measure of affordances in the current study. The relationships between these measures may partly explain this finding. Ramstead et al. (2016) indicate that individuals discern a community's expectations through landscapes of affordances. But what if the components of that landscape send incoherent messages? Mattern (2021) notes that generations of actors create a community's spaces over time. These actors do not always communicate, and at times they oppose each other's worldviews directly. This can result in cityscapes in which some systems afford actions to mobility-disabled people and others do not.

In the current study, the messages embedded in housing, transit, and sidewalk affordances had almost no relationship to each other. The strongest relationship, between housing and sidewalk affordances (r = -.14, p = .17) hinted at competing messages. These

findings resemble those of a previous study, which also found that housing, transit, and sidewalk affordances had weak and sometimes inverse relationships (Glendening, in progress). Together, these studies highlight the possibility that messages communicated through different types of affordances limit each other's influence. Phillips et al. (2004) propose that messages lead to shared beliefs most effectively when they cohere internally and do not compete with existing and accepted ideas. Many writers have shown that disability stigma is both pervasive and accepted in Western societies like the US (e.g., McRuer, 2006). Given that, a landscape with conflicting affordances may not be able to improve attitudes about mobility-disabled people passively.

However, a few unusual pieces of architecture with explicit messages about mobility-disabled people might reduce stigma more effectively than a landscape. In the late 1950s, members of the Situationist International developed détournement, a method of coopting parts of dominant society to expose its flaws (Debord & Wolman, 1956). Hamraie and Fritsch (2019) argue for a similar technique called crip technoscience, urging accessibility projects not to blend smoothly into their surroundings. These projects create *friction*, making observers consider the subtle politics of spatial inequality in liberal societies. If landscapes of affordances have limited influence over disability stigma, as this paper suggests, mobility-disabled people might still alter that stigma through strategic, friction-inducing changes to built environments.

Stigma and community demographic features

As noted above, an individual's age, sex, political ideology, and degree of contact with disabled people influence that person's degree of implicit disability stigma. But in the current study, none of these factors were related to disability stigma at the community level. This finding may reflect the study's sample and definition of community. For example, other studies find associations between neighborhood-level conservatism and mental health stigma (Gonzales et al., 2017; Gonzales et al., 2018). However, it is also possible that disability stigma operates differently at the community level than between individuals.

Identifying the causes and correlates of community-level disability stigma is key to addressing that stigma in the future. The primary reason for this is that community-level stigma harms disabled people materially. However, communities also serve as the context in which interventions designed to reduce individual-level stigma take place. As such, a community's general attitudes may prevent otherwise successful interventions from succeeding (Hatzenbuehler, 2016). Given this sobering fact, what community features might we expect to influence community-level stigma?

A community's degree of rurality and its general economic conditions offer possible answers. In a study with 300 adults experiencing serious mental illnesses, Leickly et al. (2021) found that participants perceived more stigma in rural areas. Likewise, Gonzalez et al. (2018) identified a neighborhood's socioeconomic disadvantage and low housing density as factors related to stigma against people with psychiatric disabilities. Because psychiatric disabilities differ substantially from those affecting mobility, factors that influence stigma against the former may not do so against the latter. Nonetheless, the fact that communities tend to minimize differences between disabled people justifies investigating these factors (Nario-Redmond, 2010). If, as I suggested above, reducing stigma allows the Social Security Administration to support its beneficiaries while remaining fiscally responsible, addressing community-level stigma is a necessary part of this process. It would benefit the Administration to examine predictors of community-level disability stigma in future projects.

Limitations

This study had several limitations that readers should consider. First, the data used in the current study are 9 to 11 years old because I required variables from the 2011 American Housing Survey. They provide a snapshot of the period in which researchers collected them, and readers will likely agree that the world has changed since then. Second, voting behaviors do not reflect political ideology perfectly. A person who supports one party's candidate in an election cycle may support that party's opponent or simply not vote in the next cycle. Third, metropolitan areas may be too large to constitute landscapes of affordances. Ramstead et al. (2016) define a *field of affordances* as the parts of a landscape that a person engages at any given time. It is possible that built environments influence attitudes or integration through these fields, which by definition are more salient to individuals than landscapes.

Finally using the Disability Attitudes Implicit Association Test limited my study in two ways. First, the test measures general disability stigma instead of stigma specific to mobility-disabled people. Specifically, the 2012 test used depictions of both mobility and vision disabilities to measure stigmatizing attitudes. This means that I could not separate attitudes about mobility-disabled and blind people in the current study. However, research suggests that non-disabled people hold general attitudes toward disabled as a group rather than tailoring those attitudes to people with specific disabilities (Nario-Redmond, 2010). Second, the test did not randomly sample participants. Like all tests maintained by Project Implicit, it relied on data from volunteers who do not perfectly represent the overall US population (Nosek et al., 2007).

Conclusion

The goal of the current study was to better understand the relationships between environmental affordances, disability stigma, and labor integration. Its results provided several takeaways. First, coherent landscapes of affordances seem to be few and far between in American cities. Second, a community's level of disability stigma may impede mobility-disabled people's access to local work opportunities. Finally, factors associated with implicit disability stigma among individuals may not predict that stigma at the community level. The current study examined formal labor and accepted its value as a proxy for community integration. Future work can expand its findings by focusing on other forms of integration and informal labor among mobility-disabled people from different communities.

References

Aldersey, H., Quadir, M. M., Akter, S., Mozumder, R. H., Nazneen, N., & Nuri, R. P. (2018). Barriers and facilitators for wheelchair users in Bangladesh: A participatory action research project. *Disability, CBR, & Inclusive Development, 29*(2), 24-44. https://doi.org/10.5463/DCID.v29i2.730

Ali, M., Schur, L., & Blanck, P. (2011). What types of jobs do people with disabilities want? *Journal of Occupational Rehabilitation, 21*(2), 199-210. https://doi.org/10.1007/s10926-010-9266-0

Antonak, R. F., & Livneh, H.. (2000). Measurement of attitudes towards persons with disabilities. *Disability & Rehabilitation, 22*(5), 211-224. https://doi.org/10.1080/096382800296782

Aykuz, M., Yalcin, E., Selcuk, B., & Degirmenci, I. (2014). The barriers limiting the social integration of wheelchair users with spinal cord injury in Turkish society. *Neurosurgery Quarterly, 24*(3), 225-228. https://doi/10.1097/WNQ.0000000000000116

Banda-Chalwe, M., Nitz, J. C., & de Jonge, D. (2014). Impact of inaccessible spaces on community participation of people with mobility limitations in Zambia. *African Journal of Disability, 3*(1), 1-17. https://dx.doi.org/10.4102%2Fajod.v3i1.33

Barclay, L., McDonald, R., Lentin, P., & Bourke-Taylor, H. (2016). Facilitators and barriers to social and community participation following spinal cord injury. *Australian Occupational Therapy Journal, 63*(1), 19-28. https://doi.org/10.1111/1440-1630.12241

Barker, D. J., Reid, D., Cott, C. (2006). The experience of senior stroke survivors: Factors in community participation among wheelchair users. *Canadian Journal of Occupational Therapy, 73*(1), 18-25. https://doi.org/10.2182%2Fcjot.05.0002

Bellemare, C., Goussé, M., Lacroix, G., & Marchand, S. (2019). *Physical disability, discrimination, and public subsidies: Evidence from a field experiment controlling for workplace accessibility* [Working Paper]. Université Laval. https://www.fss.ulaval.ca/sites/fss.ulaval.ca/files/fss/economique/professeurs/Physical_Disability_and_Labor_Market_Discrimination.pdf

Bjørnshagen, V., & Ugreninov, E. (2021). Disability disadvantage: Experimental evidence of hiring discrimination against wheelchair users. *European Sociological Review, 37*(5), 818-833. https://doi.org/10.1093/esr/jcab004

Brucker, D. L., & Houtenville, A. J. (2015). People with disabilities in the United States. *Archives of Physical Medicine and Rehabilitation, 96*(5), 771-774. https://doi.org/10.1016/j.apmr.2015.02.024

Clifton, K. J., Smith, A. D. L., & Rodriguez, D. (2007). The development and testing of an audit for the pedestrian environment. *Landscape & Urban Planning, 80*(1/2), 95-110. https://doi.org/10.1016/j.landurbplan.2006.06.008

Cook, J. E., Purdie-Vaughns, V., Meyer, I. H., & Busch, J. T. A. (2014). Intervening within and across levels: A multilevel approach to stigma and public health. *Social Science & Medicine, 103*, 101-109. https://doi.org/10.1016/j.socscimed.2013.09.023

Costanza-Chock, S. (2020). *Design justice: Community-led practices to build the worlds we need*. MIT.

Cunningham, W. A., Preacher, K. J., & Banaji, M. R. (2001). Implicit attitude measures: Consistency, stability, and convergent validity. *Psychological Science, 12*(2), 163-170. https://doi.org/10.1111%2F1467-9280.00328

Debord, G., & Wolman, G. J. (1956, May.) A user's guide to détournement. *Les Lèvres Nues #8*. https://www.cddc.vt.edu/sionline/presitu/usersguide.html

Dorjbal., D., Prodinger, B., Zanini, C., Avirmed, B., Stucki, G., & Rubinelli, S. (2020). Living with spinal cord injury in Mongolia: A qualitative study on perceived environmental barriers. *The Journal of Spinal Cord Medicine, 43*(4), 518-531. https://doi.org/10.1080/10790268.2019.1565707

Egloff, B., & Schmukle, S. C. (2002). Predictive validity of an implicit association test for assessing anxiety. *Journal of Personality and Social Psychology, 83*(6), 1441-1445. https://psycnet.apa.org/doi/10.1037/0022-3514.83.6.1441

Fawcett, S. R., White, G. W., Balcazar, F. E., Suarez-Balcazar, Yolanda, Mathews, R. M., Paine-Andrews, A., Seekins, T., & Smith, J. F. (1994). A contextual-behavioral model of empowerment: Case studies involving people with physical disabilities. *American Journal of Community Psychology, 22*(4), 471-496. https://doi.org/10.1007/BF02506890

Fothergill, K. E., Ensminger, M. E., Robertson, J., Green, K. M., Thorpe, R. J., & Juon, H.-S. (2011). Effects of social integration on health: A prospective study of community engagement among African American women. *Social Science & Medicine, 72*(2), 291-298. https://doi.org/10.1016/j.socscimed.2010.10.024

Garland Thomson, R. (2011). Misfits: A feminist materialist disability concept. *Hypatia, 26*(3), 591–609. https://doi.org/10.1111/j.1527-2001.2011.01206.x

Glendening, Z. S. (under review). *(Con)testing stigma against wheelchair users in built environments*. Vanderbilt University, Community Research & Action.
Glendening, Z. S. (in progress). *Environmental affordances and rental discrimination*. Vanderbilt University, Community Research & Action.
Gonzales, L., Chan, G., & Yanos, P. T. (2017). Individual and neighborhood predictors of mental illness stigma in New York state. *Stigma and Health, 2*(3), 175-181. https://doi.org/10.1037/sah0000043
Gonzales, L., Yanos, P. T., Stefancic, A., Alexander, M. J., & Harney-Delehanty, B. (2018). The role of neighborhood factors and community stigma in predicting community participation among persons with psychiatric disabilities. *Psychiatric Services, 69*(1), 76-83. https://doi.org/10.1176/appi.ps.201700165
Graham, J. W. (2003). Adding missing-data-relevant variables to FIML-based structural equation models. *Structural Equation Modeling: A Multidisciplinary Journal, 10*(1), 80-100. https://doi.org/10.1207/S15328007SEM1001_4
Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology, 78*(6), 1360-1380. https://www.jstor.org/stable/2776392
Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology, 74*(6), 1464-1480. https://doi.org/10.1037/0022-3514.74.6.1464
Greenwald, A. G., & Nosek, B. A. (2001). Health of the Implicit Association Test at age 3. *Experimental Psychology, 48*(2) 85-93. https://doi.org/10.1026//0949-3946.48.2.85
Hammel, J., Magasi, S., Heinemann, A., Gray, D. B., Stark, S., Kisala, P., Carlozzi, N. E., Tulsky, D., Garcia, S. F., & Hahn, E. A. (2015). Environmental barriers and supports to everyday participation: A qualitative insider perspective from people with disabilities. *Archives of Physical Medicine & Rehabilitation, 96*(4), 578-588. https://doi.org/10.1016/j.apmr.2014.12.008
Hamraie, A. (2017). *Building access: Universal design and the politics of disability*. University of Minnesota.
Hamraie, A., & Fritsch, K. (2019). Crip technoscience manifesto. *Catalyst, 5*(1), 1–34. https://doi.org/10.28968/cftt.v5i1.29607
Harder, J. A., Keller, V. N., & Chopik, W. J. (2019). Demographic, experiential, and temporal variation in ableism. *Journal of Social Issues, 75*(3), 683-706. https://doi.org/10.1111/josi.12341
Hatzenbuehler, M. L. (2016). Structural stigma.: Research evidence and implications for psychological science. American Psychologist, 71(8), 742-751. https://psycnet.apa.org/doi/10.1037/amp0000068
Hendren, S. (2020). *What can a body do? How we meet the built world*. Riverhead Books.
Herrero, J., Fuente, A., & Gracia, E. (2011). Covariates of subjective well-being among Latin American immigrants in Spain: The role of social integration in the community. *Journal of Community Psychology, 39*(7), 761-775. https://doi.org/10.1002/jcop.20468
Hoenig, H., Landerman, L. R., Shipp, K. M., & George, L. (2003). Activity restriction among wheelchair users. *Journal of the American Geriatrics Society, 51*(9), 1244-1251. https://doi.org/10.1046/j.1532-5415.2003.51408.x
Imrie, R. (2003). Architects' conceptions of the human body. *Environment and Planning D: Society & Space, 21*(1), 47–65. https://doi.org/10.1068%2Fd271t
Kafer, A. (2013). *Feminist, queer, crip*. Indiana University.

Kaye, H. S. (2009). Stuck at the bottom rung: Occupational characteristics of workers with disabilities. *Journal of Occupational Rehabilitation, 19*(2), 115-128. https://doi.org/10.1007/s10926-009-9175-2

Kweon, B.-S., Sullivan, W. C., & Wiley, A. R. (1998). Green common spaces and the social integration of inner-city older adults. *Environment & Behavior, 30*(6), 832-858. https://doi.org/10.1177%2F001391659803000605

Lane, K. A., Banaji, M. R., Nosek, B. A., & Greenwald, A. G. (2007). Understanding and using the Implicit Association Test: IV. What we know (so far). In B. Wittenbrink, & N. Schwarz (Eds.), *Implicit measures of attitudes: Procedures and controversies* (pp. 59-102). Guilford.

Leickly, E., Townley, G., Dover, T. L., Brusilovskiy, E., & Salzer, M. S. (2021). Exploring urbanicity and its relationship with stigma and well-being outcomes for people with serious mental illnesses. *American Journal of Orthopsychiatry, 91*(2), 208–216. https://doi.org/10.1037/ort0000466

Levins, S. M., Redenbach, D. M., & Dyck, I. (2004). Individual and societal influences on participation in physical activity following spinal cord injury: A qualitative study. *Physical Therapy, 84*(6), 469-509. https://doi.org/10.1093/ptj/84.6.496

Lin, L. I-K. (1989). A concordance correlation coefficient to evaluate reproducibility. *Biometrics, 45*(1), 255-268. https://doi.org/10.2307/2532051

Link, B. G., & Phelan, J. C. (2001). Conceptualizing stigma. *Annual Review of Sociology, 27*(1), 363–385. https://doi.org/10.1146/annurev.soc.27.1.363

Mattern, S. (2021). *A city is not a computer: Other urban intelligences*. Princeton University.

McDonald, K. E., Williamson, P., Weiss, S., Adya, M., Blanck, P., & DBTAC: Southeast ADA Center PAR Research Consortium. (2015). The march goes on: Community access for people with disabilities. *Journal of Community Psychology, 43*(3), 348-363. https://doi.org/10.1002/jcop.21683

McHugh, M. L. (2012). Interrater reliability: The kappa statistic. *Biochemia Medica, 22*(3), 276-282. PMID: 23092060; PMCID: PMC3900052.

McMillan, T. E., Cubbin, C., Parmenter, B., Medina, A. V., & Lee, R. E. (2010). Neighborhood sampling: How many streets must an auditor walk? *International Journal of Behavioral Nutrition & Physical Activity, 7*(1), 1-5. https://doi.org/10.1186/1479-5868-7-20

McRuer, R. (2006). *Crip theory: Cultural signs of queerness and disability*. New York University.

Meyer, B. D., & Mok, W. K. C. (2019). Disability, earnings, income and consumption. *Journal of Public Economics, 171*, 51-69. https://doi.org/10.1016/j.jpubeco.2018.06.011

Meyers, A. R., Anderson, J. J., Miller, D. R., Shipp, K., & Hoenig, H. (2002). Barriers, facilitators, and access for wheelchair users: Substantive and methodologic lessons from a pilot study of environmental effects. *Social Science & Medicine, 55*(8), 1435-1446. https://doi.org/10.1016/S0277-9536(01)00269-6

Mitra, S., & Kruse, D. (2016) Are workers with disabilities more likely to be displaced? *The International Journal of Human Resource Management, 27*(14), 1550-1579. https://doi.org/10.1080/09585192.2015.1137616

Nario-Redmond, M. R. (2010). Cultural stereotypes of disabled and non-disabled men and women: Consensus for global category representations and diagnostic domains. *British Journal of Social Psychology, 49*(3), 471-488. https://doi.org/10.1348/014466609X468411

Nosek, B. A., Smyth, F., L., Hansen, J. J., Devos, T., Lindner, N. M., Ranganath, K. A., Smith, C. T., Olson, K. R., Chugh, D., Greenwald, A. G., & Banaji, M. R. (2007). Pervasiveness and correlates of implicit attitudes and stereotypes. *European Review of Social Psychology, 18*(1), 36-88. https://doi.org/10.1080/10463280701489053

Okech, D., Hansen, N., Howard, W., Anarfi, J. K., & Burns, A. C. (2018). Social support, dysfunctional coping, and community reintegration as predictors of PTSD among human trafficking survivors. *Behavioral Medicine, 44*(3), 209-218. https://doi.org/10.1080/08964289.2018.1432553

Östlund, G., & Johansson, G. (2018). Remaining in workforce—Employment barriers for people with disabilities in a Swedish context. *Scandinavian Journal of Disability Research, 20*(1), 18-25. http://doi.org/10.16993/sjdr.4

Paul, S., Rafal, M., & Houtenville, A. (2020a). *Annual disability statistics compendium: 2020*. University of New Hampshire, Institute on Disability. https://disabilitycompendium.org/sites/default/files/user-uploads/Events/2021_release_year/Final%20Accessibility%20Compendium%202020%20PDF_2.1.2020reduced.pdf

Paul, S., Rafal., M., & Houtenville, A. (2020b). *Annual disability statistics supplement: 2020*. University of New Hampshire, Institute on Disability. https://disabilitycompendium.org/sites/default/files/user-uploads/Events/2021_release_year/2020%20Supplement%20reduced.pdf

Phillips, N., Lawrence, T. B., & Hardy, C. (2004). Discourse and institutions. *The Academy of Management Review*, *29*(4), 635–652. https://doi.org/10.5465/amr.2004.14497617

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods: Instruments & Computers, 36*(4), 717-731. https://doi.org/10.3758/BF03206553

Prescott, M., Labbé, D., Miller, W. C., Borisoff, J., Feick, R. & Mortenson, W. B. (2020). Factors that affect the ability of people with disabilities to walk or wheel to destinations in their community. A scoping review. *Transport Reviews, 40*(5), 646-669. https://doi.org/10.1080/01441647.2020.1748139

Prestwich, A., Kenworthy, J. B., Wilson, M., & Kwan-Tat, N. (2008). Differential relations between two types of contact and implicit and explicit racial attitudes. *British Journal of Social Psychology, 47*(4), 575-588. https://doi.org/10.1348/014466607X267470

Ramstead, M. J. D., Veissière, S. P. L., & Kirmayer, L. J. (2016). Cultural affordances: Scaffolding local worlds through shared intentionality and regimes of attention. *Frontiers in Psychology*, *7*, 1090. https://doi.org/10.3389/fpsyg.2016.01090

Reid, D., Angus, J., McKeever, P., & Miller, K.-L. (2003). Home is where their wheels are: Experiences of women wheelchair users. *American Journal of Occupational Therapy, 57*(2), 186-195. https://doi.org/10.5014/ajot.57.2.186

Rietveld, E., & Kiverstein, J. (2014). A rich landscape of affordances. *Ecological Psychology, 26*(4), 325-352. https://doi.org/10.1080/10407413.2014.958035

Rimmer, J. H., Barth, R., Wang, E., Rauworth, A., & Jurkowski, J. (2004). Physical activity participation among persons with disabilities: Barriers and facilitators. *American Journal of Preventive Medicine*, *26*(5), 419–425. https://doi.org/10.1016/j.amepre.2004.02.002

Rosenberg, D. E., Huang, D. L., Simonovich, S. D., & Belza, B. (2013). Outdoor built environment barriers and facilitators to activity among midlife and older adults with mobility disabilities. *The Gerontologist*, *53*(2), 268-279. https://doi.org/10.1093/geront/gns119

Rudman, D. L., Hebert, D., & Reid, D. (2006). Living in a restricted occupational world: The occupational experiences of stroke survivors who are wheelchair users and their caregivers. *Canadian Journal of Occupational Therapy*, *73*(3), 141–152. https://doi.org/10.2182%2Fcjot.05.0014

Saunders S. L., & Nedelec, B. (2014). What work means to people with work disability: A scoping review. *Journal of Occupational Rehabilitation, 24*(1), 100-110. https://doi.org/10.1007/s10926-013-9436-y

Schur, L. A. (2003). Barriers or opportunities? The causes of contingent and part-time work among people with disabilities. *Industrial Relations: A Journal of Economy and Society, 42*(4), 589-622. https://doi.org/10.1111/1468-232X.00308

Shrout, P. E. (1998). Measurement reliability and agreement in psychiatry. *Statistical Methods in Medical Research, 7*(3), 301-317. https://doi.org/10.1177/096228029800700306

Snijders, T. A. B., & Bosker, R. J. (2012). *Multilevel analysis: An introduction to basic and advanced multilevel modeling* (2nd ed.). Sage.

Tariah, H. A., Ghasham, N., Alolayan, M., Alahmadi, B., & Alqarni, A. (2018). Wheelchair accessibility of mosques in Riyadh. *Work, 60*(3), 385–391. https://doi.org/10.3233/WOR-182758

Terry, R., & Townley. G. (2019). Exploring the role of social support in promoting community integration: An integrated literature review. *American Journal of Community Psychology, 64*(3-4), 509-527. https://doi.org/10.1002/ajcp.12336

Townley, G., Kloos, B., & Wright, P. A. (2009). Understanding the experience of place: Expanding methods to conceptualize and measure community integration of persons with serious mental illness. *Health & Place, 15*(2), 520-531. https://doi.org/10.1016/j.healthplace.2008.08.011

Velho, R. (2019). Transport accessibility for wheelchair users: A qualitative analysis of inclusion and health. *International Journal of Transportation Science & Technology, 8*(2), 103–115. https://doi.org/10.1016/j.ijtst.2018.04.005

Vergunst, R., Swartz, L., Mji, G., MacLachlan, M., & Mannan, H. (2015). 'You must carry your wheelchair'—Barriers to accessing healthcare in a South African rural area. *Global Health Action, 8*(1), 29003. https://doi.org/10.3402/gha.v8.29003

Ware, N. C., Hopper, K., & Tugenberg, T. (2007). Connectedness and citizenship: Redefining social integration. *Psychiatric Services, 58*(4), 469-474. https://doi.org/10.1176/ps.2007.58.4.469

White, G. W. (1992). National and community service: Challenges and opportunities for people with disabilities to volunteer in America. *Journal of Disability Policy Studies, 3*(2), 75-84. https://doi.org/10.1177%2F104420739200300205

White, G. W., Paine-Andrews, A., Mathews, R. M, & Fawcett, S. B. (1995). Home access modifications: Effects on community visits by people with physical disabilities. *Journal of Applied Behavior Analysis, 28*(4), 457-463. https://doi.org/10.1901/jaba.1995.28-457

Wilson-Kovacs, D., Ryan, M. K., Haslam, S. A., & Rabinovich, A. (2008). 'Just because you can get a wheelchair in the building doesn't necessarily mean that you can still participate': Barriers to the career advancement of disabled professionals. *Disability & Society, 23*(7), 705-717. https://doi.org/10.1080/09687590802469198

Wong, Y.-L. I., & Solomon, P. L. (2002). Community integration of persons with psychiatric disabilities in supportive independent housing: A conceptual model and methodological considerations. *Mental Health Services Research, 4*(1), 13-28. https://doi.org/10.1023/A:1014093008857

Yang, H.-Y.& Sanford, J. A. (2012). Home and community environmental features, activity performance, and community participation among older adults with functional limitations. *Journal of Aging Research, 2012,* 1-14. https://doi.org/10.1155/2012/625758