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Participation among adults with disability: The role of the urban environment

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ABSTRACT

Increasing attention is being paid to the importance of built environment characteristics for participation, especially among people with various levels of impairment or activity limitations. The purpose of this research was to examine the role of specific characteristics in the urban environment as they interact with underlying impairments and activity limitations to either promote or hinder participation in life situations. Using data from the Chicago Community Adult Health Study (2001–2003) in the United States, we used logistic regression to examine the effect of built environment characteristics on three indicators of participation (interpersonal interaction, obtaining preventive health care, and voting) among adults age 45+ ($N = 1225$). We examined effects across two levels of spatial scale: the census tract and block group. One in five adults reported difficulty walking 2–3 blocks unaided, but their odds of engaging in regular interpersonal interaction was 45% higher when they lived in areas with higher residential security. For the thirty-six percent of adults who reported visual impairment, and the odds of obtaining preventive health care were over 20% lower when living in an area with heavy traffic. Residing in an area with a high proportion of streets in poor condition was associated with 60% lower odds of voting among those with underlying difficulty with mobility activities. Results varied across levels of spatial scale. Simple changes in urban built environments may facilitate the full participation of all persons in society.

Introduction

Disability is an umbrella term encompassing impairments, activity limitations and participation restrictions, which are all dynamically influenced by environmental and individual factors (World Health Organization, 2001). Disability continues to be a major health and social issue, particularly within the context of an aging population. While evidence indicates that the prevalence of disability has been declining since the 1990s (Crimmins, 2004; Freedman et al., 2004; Freedman, Martin, & Schoeni, 2002; Manton & Gu, 2001), recent data suggest that disability has begun to increase for all but the oldest Americans (Martin, Freedman, Schoeni, & Andreski, 2010; Seeman, Merkin, Crimmins, & Karlamangla, 2010). Yet, disability is not necessarily a feature of aging nor an inevitable response to the onset or progression of a health problem. As pointed out by the sociologist Saad Nagi (1965), one of the early pioneers in this field, "disability is the expression of a physical or mental limitation in a social context".

While the role of environmental factors for impairments and activity limitations has been the subject of several studies (e.g. Clarke, Ailshire, Bader, Morenoff, & House, 2008; Clarke, Ailshire, & Lantz, 2009; Clarke & George, 2005; Yang, Mann, Nochajski, & Tomita, 1997), the concept of participation (defined as involvement in a life situation (WHO, 2001) has only recently received attention in the field of disability (Gray, Hollingsworth, Stark, & Morgan, 2008; Hollingsworth & Gray, 2010; Jette, Keysor, Coster, Ni, & Haley, 2005; Rimmer, Riley, Wang, Rauworth, & Jurkowski, 2004). Questions remain about how to best conceptualize this construct in relation to environmental factors (Whiteneck & Dijkers, 2009). The intent of this paper is to use data from a representative survey of 1225 Chicago adults to understand the dynamics of participation using measures of social interaction, obtaining healthcare, and voting. The aim here is to better understand the inter-relationship between impairments and activity limitations as they interact with characteristics in the built environment to influence participation.

Models of disability

Models of disability (Nagi, 1965; Verbrugge & Jette, 1994), and the framework on functioning issued by the World Health

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Organization (WHO, 2001), have increasingly incorporated contingency in the disability pathway by explicitly recognizing the role of contextual factors. The International Classification of Functioning, Disability and Health (WHO, 2001) (known as the ICF) is based on the biopsychosocial model of health and belongs to the family of international classifications developed by the WHO. While health conditions are classified primarily in ICD-10, the ICF provides a framework to collect a wide range of information about health, functioning, and disability, using standardized uniform common language. In 2001 the World Health Assembly endorsed the ICF for international use and urged member states to use the ICF in research, surveillance, and reporting.

The ICF (Fig. 1) is a conceptual framework that incorporates functioning at three levels: the level of the body (e.g. mental, emotional, physiological, or anatomical structures or functions), the level of the individual (e.g. activities such as mobility, self care, general tasks), and at the level of society (participation in life situations and social roles) (Jette & Badley, 2000). Difficulty in functioning at these three levels is represented by impairments, activity limitations, and participation restrictions. For example, an individual with arthritis may experience pain (impairment in sensory functions) that leads to difficulty in walking (activity limitation), which may restrict his or her involvement in life situations, such as meeting with close friends (participation restriction). The ICF also incorporates environmental and personal factors that can impede or enhance a person's functioning at these three levels. Environmental factors are classified under five broad headings: products and technology; natural environment and human-made changes to the environment; support and relationships; attitudes; services, systems and policies (WHO 2001). In this research we focus on the modifying effect of the urban built environment in the pathway between impairments or activity limitations and participation (restrictions).

The interactive role of the built environment for disability can be illustrated by comparing two individuals who have sustained a stroke. Although they both have a severe right hemiparesis and can no longer drive, they may have very different levels of independence and participation. For instance, one person may live close to an accessible public transit system, with connections to local stores and services to permit the accomplishment of day-to-day activities (e.g. shopping and banking) and social interaction. The other person may live in a more suburban community with limited sidewalks and crosswalks, and the nearest bus stop is four blocks away. As a consequence, the second person will experience considerable problems with daily activities and social isolation even though he or she has the same underlying health condition. As emphasized by Nagi (1991, p.315), "characteristics of the environment and the degree to which it is free from, or encumbered with, physical and sociocultural barriers" can lead to very different patterns and levels of independence and participation in those with identical types of impairments or activity limitations.

The built environment in the disablement process

There has been considerable attention to the role of environmental factors for physical activity and obesity (e.g. Diez Roux et al., 2007; Morenoff, Diez Roux, Hansen, & Osypuk, 2008; Morland, Wing, & Diez Roux, 2002), and a growing body of literature has examined the importance of the environment for disability. For example, poor street conditions, heavy traffic, and excessive noise have been shown to be associated with the onset of difficulty with movement-related activities (e.g. standing in place, lifting heavy objects, climbing stairs) up to three years later (Balfour & Kaplan, 2002; Schootman et al., 2006). Uneven sidewalks and sidewalk obstacles (i.e. stones and other debris) are responsible for the vast majority of outdoor falls among older adults (Li et al., 2006), and data from the city of Chicago indicate that poor street conditions are associated with a four-fold higher odds of walking difficulty among adults with underlying lower extremity weakness (Clarke et al., 2008). Results from nationally representative panel data in the United States have shown that living in neighborhoods characterized by more motorized travel is associated with a 50% higher odds of mobility limitations over time (Clarke et al., 2009).

Research is also increasingly focusing on the consequences of the environment for participation, especially from the perspective of community-based rehabilitation (e.g. Hollingsworth & Gray, 2010). While performance of an activity takes place at the individual level, participation is performance at the societal level through the fulfillment of social roles (Whiteneck & Dijkers, 2009; WHO 2001). Barriers in the built environment may have consequences for participation if adults with underlying impairments or activity limitations become fearful of walking outside on their own, with spillover effects on social isolation (Debnam, Harris, Morris, Parikh, & Shirey, 2002), the ability to carry out daily activities (e.g. shopping, banking) (Clarke & George, 2005; Keysor et al., 2010), and nursing home admission (Cohen, Tell, & Wallack, 1986; Gill, Allore, & Han, 2006; Jette, Branch, Sleeper, Feldman, & Sullivan, 1992). More than half of adults with disability (impairments and/or activity limitations) do not engage in any leisure-time

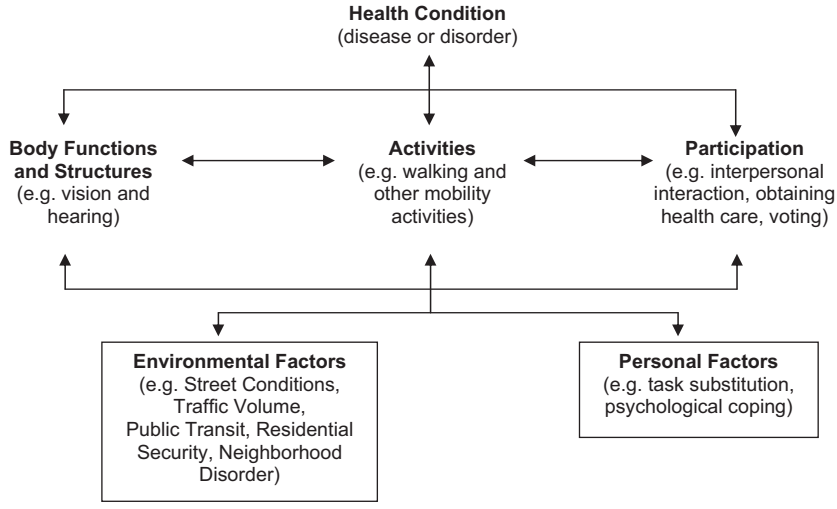

Fig. 1. Interactions between the Components of the ICF Model (adapted from WHO, 2001).