



## Ripple effects of developmental disabilities and mental illness on nondisabled adult siblings



Barbara Wolfe<sup>a,\*</sup>, Jieun Song<sup>b</sup>, Jan S. Greenberg<sup>c</sup>, Marsha R. Mailick<sup>d</sup>

<sup>a</sup> Institute for Research on Poverty, La Follette School of Public Affairs, Department of Economics, and Department of Population Health Sciences, University of Wisconsin–Madison, 1180 Observatory Drive, Madison, WI 53706, USA

<sup>b</sup> Waisman Center, University of Wisconsin–Madison, 1500 Highland Ave, Madison, WI 53705-2280, USA

<sup>c</sup> School of Social Work and Waisman Center, University of Wisconsin–Madison, 1350 University Ave, Madison, WI 53706, USA

<sup>d</sup> Waisman Center and School of Social Work, University of Wisconsin–Madison, 1500 Highland Ave, Madison, WI 53705-2280, USA

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### ABSTRACT

Developmental disabilities and severe mental illness are costly to the affected individual and frequently to their family as well. Little studied are their nondisabled siblings. Here we examine major life course outcomes (education, employment, and marriage) of these siblings in adulthood using data from the Wisconsin Longitudinal Study. Our sample comprises 113 individuals with developmental disabilities and 337 of their nondisabled siblings; 97 individuals with mental illness and 235 of their nondisabled siblings; and 17,126 unaffected comparison group members. We find that siblings of individuals with mental illness have less education and less employment than the unaffected comparison group, whereas those who have a sibling with developmental disabilities had normative patterns of education and employment, but less marriage and more divorce. Robustness tests incorporating genetic data do not change the conclusions based on the nongenetic analyses.

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### Introduction

Developmental disabilities and serious mental illness are prevalent in American society, placing individuals with such conditions at heightened risk for divergent life course outcomes. Approximately 1.5% of the U.S. population has a developmental disability (DD) such as Down syndrome, autism, or hundreds of other genetic and nongenetic causes of intellectual disability (formerly referred to as mental retardation; Larson et al., 2001). Individuals with DD are at high risk for unemployment and psychological distress and low likelihood of marriage (Fujura, 2003); they continue to rely upon their families in adulthood because most do not establish their own households or have children (Shattuck et al., 2012; Wells, Sandefur, & Hogan, 2003). Serious mental illness (MI) is more common, with a prevalence of 4.6% of the adult population in the United States (SAMHSA, 2012). Few studies have examined whether major life course outcomes (i.e., education, marriage, and employment) are divergent among nondisabled siblings who have a brother or sister with these disabilities.

For the present study, we compared siblings who have brothers or sisters with DD or MI with brothers and sisters who have no known disabilities using population-level data drawn from the Wisconsin Longitudinal Study, a cohort study based on a randomly selected sample, with data spanning a period of 50 years in the lives of participants. Virtually all past research on the lifelong effects of having a brother or sister with DD or MI was based on volunteer samples, thus the present study represents an opportunity to examine sibling effects in a population-based sample.

The emphasis of available research on sibling effects has been on the cognitive functioning and psychological well-being of nondisabled siblings. For example, Fletcher, Hair, and Wolfe (2012) recently found that having a sibling with a DD was associated with reductions in high school math and language achievement. However, there is a large body of research suggesting that most siblings of individuals with DD are indistinguishable from their age peers with respect to psychological functioning (for review, see Stoneman, 2005). Indeed, many siblings of individuals with DD experience positive reactions to having a sibling with disabilities (Hodapp, Urbano, & Burke, 2010; Taunt & Hastings, 2002), and develop positive personality characteristics (Cuskelly & Gunn, 2003; Stoneman, Brody, Davis, & Crapps, 1989), possibly because of early socialization. These personality traits developed during childhood may become psychological resources that siblings can

\* Corresponding author. Institute for Research on Poverty, 1180 Observatory Drive, Madison, WI 53706, USA. Fax: +1 608 265 3119.

E-mail addresses: [bwolfe@wisc.edu](mailto:bwolfe@wisc.edu), [wolfe@lafollette.wisc.edu](mailto:wolfe@lafollette.wisc.edu) (B. Wolfe).

draw on to succeed in major adult roles. In contrast, siblings of individuals with MI have been shown to have elevated rates of depression and neuroticism, poorer overall psychological well-being, and lower levels of cooperativeness and extraversion than controls (Farmer et al., 2003; Masi et al., 2003; Taylor, Greenberg, Seltzer, & Floyd, 2008). Recent longitudinal findings suggest that these effects persist across the life course (Taylor et al., 2008). However, no previous research using representative population-based samples have examined whether nondisabled siblings are at risk of altered life course outcomes in the realms of education, employment, and marriage by midlife.

We focus on the experience of siblings of persons with DD or MI separately because the timing of these over the life course suggests that their lives may be differentially affected. Whereas the great majority of children with DD are diagnosed at birth or in the first few years of life, MI is typically diagnosed during adolescence or young adulthood, although prodromal symptoms may be present in childhood. As a result of the difference in timing of the onset of the disability, siblings of persons with MI may not experience this family disruption until their adolescent and young adult years, when education and career goals are in the process of being shaped. In contrast, most siblings of individuals with DD have many years before adulthood to acclimate to their sibling's difficulties and therefore, may experience fewer disruptions in their life course. Yet siblings of persons with DD are often asked at an early age to take on a caregiving role. Using a national volunteer survey, Hodapp et al. (2010) found that relative to the U.S. population, female siblings of persons with DD married later but had lower rates of divorce. This suggests that siblings of adults with DD may delay marriage to help care for their sibling with DD, but once married they may be less likely to be divorced, possibly due to their psychological resources (i.e., conscientiousness, agreeableness) and greater maturity due to later age of marriage, which are both related to marital stability (Shaver & Brennan, 1992).

Furthermore, the course of DD is distinctly different from the course of MI. Whereas DD tends to be characterized by relative stability in day-to-day functioning, the symptoms of MI are more episodic and have a less predictable course. The unpredictable nature of the symptoms may increase the day-to-day uncertainty of the well-sibling's life, even for siblings who live apart from their brother or sister with MI. The unpredictable course of MI is also known to affect the marriage of their parents (Cook, Hoffschmidt, Coher, & Pickett, 1992) and the available research suggests that this pattern spills over and may also negatively affect the marriage of their nondisabled siblings (Seltzer, Greenberg, Krauss, Gordon, & Judge, 1997). For different reasons (i.e., the unpredictable nature of MI, the long-term caregiving needs of adults with DD), having a sibling with DD or MI may increase the siblings' risk of off-time transitions (e.g., delayed or interrupted marriage or labor force participation). Yet these sibling effects have not yet been studied using population-based samples.

Additionally, from a life course perspective, the concept of linked lives, positing that "individual lives are intimately connected to the lives of others, and individual development is bound to and shaped by these ties" (Settersten, 2003, p. 38), suggests that DD and MI not only will result in life course disruptions for the individual with the condition but also for the members of their family. For this reason we study alterations in patterns of education, marriage, and employment both in nondisabled siblings of adults with DD or MI and in their brothers and sisters with disabilities.

Finally, we recognize that early adverse childhood experiences that are independent of having a sibling with a disability will likely have long-term effects on life course outcomes on nondisabled siblings, and these need to be controlled in the analysis of sibling effects. For example, parental divorce or separation (Huurre,

Junkkari, & Aro, 2006; McLanahan & Sandefur, 1997), parental death (Lansford et al., 2006; Schmiede, Khoo, Sandler, Ayers, & Wolchik, 2006), and low socioeconomic status (Haveman & Wolfe, 1995) have all been shown to affect long-term life course outcomes, and in the present research, we take these into account.

## The present study

Our major research question is whether nondisabled siblings of individuals with DD and MI have divergent life course outcomes in the domains of education, employment, and marriage compared to their nondisabled age-peers who do not have a sibling with a disability or chronic condition. We conducted three sets of analyses.

First, for the major analysis of this study, we focused on the nondisabled siblings of individuals with DD and MI. On the basis of theory and prior research, we hypothesized that siblings of adults with severe MI would have lower levels of educational attainment and employment, decreased likelihood of ever having been married, and higher rates of divorce. The existing literature on siblings of individuals with DD shows few differences between these siblings of individuals and their age peers except in the realm of marriage (Hodapp et al., 2010; Stoneman, 2005); hence, we hypothesized that siblings of individuals with DD would be similar to their age-peers with respect to educational attainment and employment, but would show divergent marital patterns.

Second, we conducted an analysis to benchmark the extent to which individuals with DD and MI *themselves* have divergent patterns of life course outcomes during the transition to adulthood and into the adult years. Although much past research has shown such patterns of poorer life course outcomes for adults with MI (Breslau et al., 2011; Ettner, Frank, & Kessler, 1997; Forthofer, Kessler, Story, & Gotlib, 1996; Jayakody, Danzinger, & Kessler, 1998; Kessler, Foster, Saunders, & Stang, 1995; Kessler, Walters, & Forthofer, 1998; Kessler et al. 1997), almost no population-based studies have been conducted in the United States focused on life course outcomes of adults with DD. Thus, our second analysis was conducted to quantify the magnitude of the divergence of individuals with disabilities in educational, marital, and employment outcomes.

Finally, in an exploratory analysis, we conducted robustness tests by incorporating genetic data available on a large subgroup of respondents in order to reduce the likelihood that the hypothesized sibling effects were due to shared genetic vulnerabilities of the nondisabled siblings of adults with MI, in particular. We hypothesized that the differences between siblings of individuals with MI and the comparison group would be reduced in magnitude once genes known to be associated with mental health problems are brought into the analysis. To the extent that the estimates are unchanged from models without genetic controls, we interpret our results as preliminary suggestive evidence that we are measuring the influence of having a disabled sibling rather than simply shared genetics. We did not expect a reduction in effect to be evident in siblings of individuals with DD since the genetic control we used was risk for depression.

## Method

### Data and sample

The Wisconsin Longitudinal Study (WLS) is a one-third random sample of 10,317 women and men who graduated from Wisconsin high schools in 1957 (Hauser, Sheridan, & Warren, 1998). Follow-up surveys were conducted in 1975 with 9138 (90.1%) surviving members of the original sample when they were, on average, 36 years old; in 1992 with 8493 (87.2%) of the surviving original respondents when they were in their early 50s; and again in 2004

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