

## Physical Disability and Suicidal Ideation: A Community-Based Study of Risk/Protective Factors for Suicidal Thoughts

DAVID RUSSELL, PHD, R. JAY TURNER, PHD, AND THOMAS E. JOINER, PHD

Although the significance of poor physical health for suicide risk is well established, the potential relevance of physical disability, as distinct from diseases and traumas that give rise to disability, has received little attention. Prior evidence suggests the possible utility of the stress process theoretical model for understanding variations in risk for suicide ideation and the contribution of physical disability to such risk. In this article, we examine the independent and joint explanatory significance of physical disability and components of the stress process model for risk of suicide ideation. Data from an ethnically diverse and representative sample of disabled and nondisabled adults ( $n = 1,768$ ) reveal that physical disability is associated with a greater risk of lifetime suicidal ideation.

In 2004, suicide was the eleventh leading cause of death in the general population (Hoyert, Heron, Murphy, & Kung, 2006) and the second leading cause among adults between the ages of 25 and 34 (National Center for Health Statistics, 2006). The rec-

ognition of suicide as a major public health problem has led researchers to search for risk factors that have implications for preventive interventions. Given evidence for its risk significance, one research strategy has involved efforts to identify the correlates of suicidal thoughts. Research has identified several socio-demographic factors associated with risk for suicidal ideation including age, gender, race/ethnicity, education, and marital status (Kessler, Borges, & Walters, 1999; Kuo, Gallo, & Tien, 2001).

Studies have also been quite consistent in linking risk for ideation with a history of psychiatric disorder (Fennig et al., 2005; Kessler, Borges, & Walters, 1999; Kuo, Gallo, & Tien, 2001), and exposure to stressful events (Fennig et al., 2005; Locke & Newcomb, 2005; Mchholm, MacMillan, & Jamieson, 2003; Read, Agar, Barker-Collo, Davies, & Moskowitz, 2001). Unfortunately, studies on the role of social stress have universally indexed variations in exposure only in terms of recent life events. Such measures have been shown to generally underestimate the magnitude of the social stress—depression association

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DAVID RUSSELL, Ph.D. is with the Center for Home Care Policy & Research, Visiting Nurse Service of New York; R. JAY TURNER, Ph.D. is with the Department of Sociology, and Center for Demography and Population Health, Florida State University; and THOMAS E. JOINER, Ph.D. is with the Department of Psychology, Florida State University.

This study was supported by two research grants from the National Institute of Drug Abuse to Dr. R. Jay Turner, Grant Numbers DA16429-01 and 5 R01 DA 10772-03, as well as by a Postdoctoral Fellowship from the National Institute of Mental Health. An earlier version of this paper was presented at the 2007 Annual Meeting of the Society for the Study of Social Problems.

Address correspondence to David Russell, Center for Home Care Policy & Research, Visiting Nurse Service of New York, 1250 Broadway, 20th Floor; E-mail: david.russell@vnsny.org

(Turner, Wheaton, & Lloyd, 1995) and to dramatically underestimate the elevation in stress exposure among African Americans relative to whites and of persons of low socioeconomic status relative to their advantaged counterparts (Turner & Avison, 2003). It thus appears that the significance of stress exposure for risk of suicide ideation remains to be effectively evaluated.

Although the risk significance of poor physical health also seems well enough established (e.g., Duberstein, Conwell, Conner, Eberly, & Caine, 2004; Fairweather, Anstey, Rodgers, & Butterworth, 2006; Hawton & Fagg, 1988; Waern, 2003), the potential relevance of physical disability, as distinct from diseases and traumas that give rise to disability, has received relatively little attention. There are several reasons to hypothesize physical disability as a risk factor for suicidal ideation. First, physical disability represents a source of chronic stress that involves lasting difficulties in managing every-day instrumental and social activities (Turner & Noh, 1998). Secondly, recent research has documented strong relationships between physical disability and psychiatric and substance disorders, emotional distress, social inadequacy, and alienation (Rokach, Lehcier-Kimel, & Safarov, 2006; Turner, Lloyd, & Taylor, 2006). To the extent that the physically disabled view themselves as a constant burden to others, especially close kin, they may see suicide as a solution to this perceived problem (Joiner, 2005). Thus, whether physical disability increases risk for suicide ideation, and hence for suicide, and whether any such effects are direct or indirect through psychiatric disorders, are unanswered questions that are of crucial importance for the effective targeting of prevention efforts. A resolution of these questions requires a determination of the risk significance of physical disability independent of variations in other forms of stress exposure and of history of psychiatric and substance disorders.

While suicide ideation may develop in the context of psychiatric disorder, severe disease, and other health problems, scholars have emphasized the practical and theoretical

importance of identifying potentially modifiable factors that amplify or moderate the risk associated with such experiences (Brezo, Paris, & Turecki, 2006; Duberstein et al., 2004). The abundant evidence from studies on stress and depression demonstrating the explanatory relevance of the stress process model (Aneshensel & Phelan, 1999; Turner & Lloyd, 1999) suggests its possible utility for understanding variations in risk for suicide ideation and the contribution of physical disability to such risk. This model is based on a recognition that the significance of life stress for health depends upon more than differences in the extent of exposure (Billings & Moos, 1982; Pearlin, Lieberman, Menaghan, & Mullan, 1981). Also of substantial significance are variations in the availability of coping resources that have been found to mediate and/or moderate stress effects (Cobb, 1976; Thoits, 1995; Turner & Roszell, 1994; Turner & Lloyd, 1999). Central among these resources are social support and personal attributes such as mastery and self esteem. It has been argued that coping resources, as well as exposures to social stress, arise out of the social context or conditions of life to which the individual is exposed (Pearlin, 1989). To the extent that important differences in such conditions tend to be defined by one's social statuses, including disability status, the stress process model may also advance understanding of the social distribution of suicide ideation.

### THE PRESENT STUDY

A recent two-wave panel study of community-residing adults with and without physical limitations provides an opportunity to address these issues. We hypothesize that: (1) physical disability is associated with increased risk of suicidal ideation; (2) physical disability is independently linked with each of the stress process components (social stress, social support, mastery, self-esteem, and emotional reliance); and (3) variations in levels of the stress process components account for the heightened risk of suicidal ideation.

ation among persons with a physical disability. We employ descriptive and multivariate analyses to assess the independent and joint explanatory significance of physical disability, demographic factors, and components of the stress process model for risk of suicide ideation.

## METHOD

### *Sample*

Data for this paper are drawn from a community-based two-wave panel study undertaken to examine social antecedents and correlates of mental health and substance problems among individuals with and without a physical disability. The sampling frame for this survey was developed by screening 10,000 households within Miami-Dade County Florida. The details of this sampling procedure have been presented elsewhere (Turner, Lloyd, & Taylor, 2006). The sample was drawn such that 50 percent had been screened as disabled and 50 percent were female. In addition, non-Hispanic Whites, African Americans, persons of Cuban heritage, and other Hispanics were equally represented. According to the U.S. Census, these four racial/ethnic groups comprise about 95 percent of the Miami-Dade County population. Excluded were those disabled solely due to psychiatric or developmental disabilities and those who, although community residing, were receiving significant nursing care.

A total of 1,986 first wave interviews were completed in 2000–2001 (success rate = 82%), including 1,086 adults who screened as having no activity limitations and 900 individuals who screened as having a disability. The over sampling of individuals with physical disabilities resulted in a greater proportion of older individuals than in the general population. Ages in the sample ranged from 18 to 93 with a median of 59 (the median age of the general population of Miami-Dade County in 2000 was 35.6; see Census 2000, Summary File 1, Table P13). Of the 900 who, within the screening process, were reported

by a family member as having activity limitations, only 559 confirmed this status within the actual interview. Second wave interviews were conducted an average of three years later. A total of 1,513 second wave interviews were completed. Excluding 100 first wave participants who had died and 59 who were too ill to be interviewed, the second wave success rate was 82.5 percent.

All interviews were computer assisted and offered in English or Spanish at the preference of each participant. Interviewers, two thirds of whom were bilingual, all held bachelor's degrees. Although many had prior field-interviewing experience, all received extensive training on interviewing techniques, on the responsible conduct of research, and on the process of obtaining truly informed consent from participants. Institutional review board (IRB) approval for this study was obtained prior to data collection. Signed consent was obtained for each interview and following detailed coverage of each topic addressed within the consent form, including the fact that a Certificate of Confidentiality had been obtained from the federal government assuring the confidentiality of reports of illegal behavior.

### *Measures*

*Suicide Ideation.* The presence of suicide ideation was assessed by a single yes/no response with respect to an experience listed on a card that read "you seriously thought about committing suicide." At the Time 1 interview, 107 participants reported having had such an experience. However, within the Time 2 interview approximately three years later, an additional 29 study participants reported such an experience as having occurred prior to the Time 1 interview. The correlation between Time 1 and Time 2 lifetime suicidal thoughts (occurring prior to Time 1) is .39, and is comparable to that reported by previous research (Joiner et al., 2002). While this correlation is not very high, the time interval between interviews averaged three years and suicide ideation tends to be an episodic phenomenon.

Under the assumption that virtually all errors in reporting suicidal thoughts are errors of omission rather than commission, ideation reported within either interview as having occurred prior to Time 1 is considered within analyses. It is important to note that preliminary analyses revealed that the likelihood of reporting the prior experience of suicide ideation was significantly conditioned by level of depressive symptomatology at the time of interview as measured by the Center for Epidemiologic Studies Depression Scale (Radloff, 1977). This apparent state dependence problem is addressed within regression analyses by controlling on level of depressive symptoms at the point of interview. Controlling for depression at the time of interview will allow us to more confidently assess the independent influence of physical limitation on suicide ideation.

*Physical Disability.* The community screening process involved obtaining reports from a single household member on the physical health status of all co-residents. During the face-to-face interview, study participants were asked: "Do you have a physical or health problem that limits or interferes with the amount or kind of day-to-day work or recreational activities you can engage in?" As noted in the sample description, less than two thirds of those screened as having a physical disability confirmed such a status within the full interview. Presumably, household members sometimes differ in their view on how much physical limitation qualifies a person as disabled. Consistent with the operational definition employed in most prior research, physical disability is assumed to be present only when the individual so self identifies.

*Stress Exposure.* Our consideration of the significance of stress exposure involves an effort to achieve more comprehensive measurement than prior studies on ideation. We evaluate four dimensions of stressful experience: recent life events, chronic stress, lifetime major and potentially traumatic events, and discrimination stress. Except for some modest changes in the chronic stress and major events measures, these instruments have

been presented in detail within papers reporting findings from a prior study of young adults (Taylor & Turner, 2002; Turner & Avison, 2003; Turner & Lloyd, 2003). Modifications were designed to capture enduring stressors and major events more likely to be experienced by older adults and/or prior historical cohorts. Scores on these four stress dimensions, measured in the Time 1 interview, were standardized and then summed into a single measure of stress exposure.

*Social Support.* Because substantial evidence has suggested its health significance, we focus on perceived or experienced social support. Our measure of this construct recognizes three relatively distinct sources: Spouse/partner, relatives, and friends. Three highly reliable scales ( $\alpha = .88-.95$ ) addressing these sources have been described in detail elsewhere (Turner & Marino, 1994). To simplify analyses, a single measure of perceived social support was constructed by standardizing scores on each dimension, summing the scores, and dividing by the number of sources on which each participant reported information. An alternative method would be to sum the three separate standardized scores, assigning individuals with missing data a value of "0" for that particular source of support. Turner and Marino (1994) contrasted results obtained using these alternative strategies and found no observable difference.

*Personal Resources.* Self esteem is measured by a six-item subset from Rosenberg's (1986) well known index ( $\alpha = .79$ ). Participants were asked to indicate their level of agreement with items such as, "I feel I have a number of good qualities," and "I take a positive attitude toward myself." Mastery was assessed using Pearlin and Schoolers's (1978) seven-item measure that includes such items as "I have little control over the things that happen to me" and "I can do just about anything that I really set my mind to" ( $\alpha = .77$ ). Based on reports of relevance for depression, we assessed level of emotional reliance with a six-item scale (Hirschfeld et al., 1977). Study participants indicated their level of agreement with statements such as "The

idea of losing a close friend is terrifying to you" and "You think most people do not realize how easily they can hurt you" ( $\alpha = .59$ ).

*Psychiatric and Substance Disorders.* In evaluating the hypothesis that physical disability increases the lifetime risk of suicidal ideation, it is important to consider the potential influence of psychiatric and substance disorders as alternative explanations to any observed association. We include a series of controls for psychiatric and substance disorders in our multivariate regression models. Psychiatric and substance disorders were estimated by data obtained using major sections of the World Mental Health version of the Composite International Diagnostic Interview (CIDI; Kessler & Ustun, 2004). The employed version is largely identical to that used in the National Comorbidity Study Replication (Kessler, Berglund, Demler, Jin, & Merikangas, 2005; Kessler & Merikangas, 2004) and the World Health Organization-sponsored World Mental Health Study. Using the relevant sections, we assessed the lifetime and past-year occurrence of major depressive disorder, dysthymia, generalized anxiety disorder, panic disorder, social phobia, post traumatic stress disorder, attention-deficit/hyperactivity disorder, childhood conduct disorder, antisocial personality disorder, and both alcohol and drug abuse and dependence. Strong evidence is available for the validity of CIDI-generated diagnoses of mood, anxiety, and substance disorders (First, Spitzer, Gibbon, & Williams, 2002; Kessler et al., 2005).

Appendix A presents the relative odds of suicide ideation for five different forms of psychiatric disorder, as well as for psychiatric comorbidity (two or more disorders and three or more disorders). These results indicate that lifetime psychiatric disorder is associated with increased risk of experiencing suicidal ideation, with PTSD and depressive disorder being the most robust predictors. The significance of psychiatric comorbidity is also clearly demonstrated. The presence of two or more disorders is related to increased risk relative to several different single disorders, while the lifetime occurrence of three

or more disorders dramatically increases risk over that of any individual disorder. It is interesting to note that, with the exception of substance and behavioral disorders, prior psychiatric disorders and psychiatric comorbidity appear to be of lesser significance for suicide ideation in the presence of physical disability.

*Socio-Demographic Variables.* Age is coded in years. Gender is coded 1 for females. Race/ethnicity was also determined by self-definition on the part of participants. Ambiguities arising from reports of being just American were resolved using information on the participants' place of birth or that of their parents. Non-Hispanic Whites are employed as the reference category in all regression analyses. Socioeconomic status was estimated using a composite score based on household income level, occupational category (Hollingshead, 1957), and educational attainment. Scores on the three status dimensions were standardized, summed, and divided by the number of status dimensions for which data were available.

## RESULTS

Table 1 presents rates of suicidal ideation across disability status for the full sample as well as within subgroups defined by status on various demographic dimensions. In support of our primary hypothesis, the first row of this table clearly indicates that having a physical disability increases the likelihood of suicidal thoughts. The relative risk of suicidal ideation among those who have a physical limitation is more than twice that observed among nondisabled individuals. Within gender analyses reveal that although women tend to experience higher levels of ideation, the increase in risk associated with physical disability is nearly equivalent across gender. The general pattern of heightened risk among persons with a physical disability also appears consistent across racial/ethnic categories. However these subgroup contrasts fall short of statistical significance and therefore offer no evidence of racial/ethnic

**TABLE 1**  
*Rates of Lifetime Suicidal Ideation across Disability and Social Statuses*

	Total	N	Nondisabled	N	Disabled	N
Total Sample	7.5	1,768	5.6 <sup>b</sup>	1,276	12.6	492
Gender						
Male	6.4	832	4.7 <sup>a</sup>	622	10.9	210
Female	8.3	936	6.2 <sup>b</sup>	654	13.8	282
Race/Ethnicity						
White Non-Hispanic	10.2	390	8.4	281	14.6	109
Cuban Hispanic	6.2	444	4.3	333	11.7	111
Non-Cuban Hispanic	9.2	399	6.9	325	17.5	74
African American	5.8	535	3.9	337	10.1	198
Age Group						
18 to 49 Years	12.1 <sup>a</sup>	568	8.6 <sup>b</sup>	465	24.2 <sup>a</sup>	103
50 to 69 Years	7.0	673	4.8 <sup>b</sup>	457	12.5	216
70 to 93 Years	4.5	526	3.9	354	5.8	172
Socioeconomic Status						
High	8.6	586	6.8 <sup>b</sup>	484	16.6	102
Medium	7.4	598	5.5 <sup>b</sup>	444	12.9	154
Low	6.6	584	4.2 <sup>b</sup>	348	10.5	236
Marital Status						
Married	6.3 <sup>a</sup>	885	5.3	667	9.6	218
Previously Married	7.7	640	5.7 <sup>b</sup>	426	12.1	214
Never Married	11.7	243	6.6 <sup>b</sup>	183	25.0	60

*Notes.* The total number of cases within each disability and social status is presented in the “N” column.

<sup>a</sup>denotes a significant difference across the specified social status category.

<sup>b</sup>denotes a significant difference across disability status.

differences in the risk significance of physical disability.

Consistent with prior research on the psychiatric disorder—ideation relationship, the significance of disability for suicide ideation varies substantially across age, with no association observed among study participants 70 and older. In the two younger groups, the relative risk associated with physical disability is 2.6 and 2.8, respectively, with disabled individuals in the youngest group being more than four times more likely to have experienced ideation than their counterparts in the oldest category. With respect to socioeconomic status (SES), these results provide no evidence of SES differences in risk, with the physical disability—suicide ideation relationship observable within each SES level. Finally, the lowest risk of ideation is found among married individuals, with

clear evidence of a disability—ideation relationship only being observable among the nonmarried.

Next, we evaluate the extent to which components of the stress process model distinguish those with and without a history of suicidal ideation. Table 2 presents mean levels of stress and of personal and social resources across suicidal ideation and disability statuses. Among those without a physical limitation, only level of stress exposure and self esteem differ significantly between those with and without a history of suicidal ideation. In contrast, within the disabled subgroup, suicide ideation is associated with clear differences in several stress process components. Disabled persons who had experienced suicidal thoughts reported higher levels of social stress and emotional reliance, and lower levels of social support, mastery,

**TABLE 2**  
*Mean Levels of Stress Process Components across Suicidal Ideation and Disability Status (N = 1,768)*

	Nondisabled		Disabled	
	No Thoughts	Thoughts	No Thoughts	Thoughts
Stress Process Components				
Social Stress	-.295 <sup>a,b</sup> (.236)	2.782 (.652)	.493 <sup>a</sup> (.159)	2.951 (.390)
Social Support	.096 (.041)	-.064 (.096)	.046 <sup>b</sup> (.061)	-.299 (.081)
Mastery	26.904 <sup>b</sup> (.423)	25.479 <sup>b</sup> (.747)	24.931 <sup>a</sup> (.445)	22.782 (.666)
Self-Esteem	28.192 <sup>a,b</sup> (.270)	27.394 (.404)	27.613 <sup>a</sup> (.228)	26.246 (.403)
Emotional Reliance	19.087 (.151)	20.280 <sup>b</sup> (.624)	19.817 <sup>a</sup> (.340)	22.138 (.735)

Notes. (Standard Errors).

<sup>a</sup>denotes a significant difference ( $p < .05$ ) across suicidal ideation status.

<sup>b</sup>denotes a significant difference ( $p < .05$ ) across disability status

and self-esteem compared to those who had never experienced such thoughts. These results are consistent with our second hypothesis that the relationship between disability and suicidal ideation partially arises from variations across disability status in components of the stress process model.

Our final objectives were to examine the significance of physical disability for suicide ideation in the context of prior histories of psychiatric disorder and components of the stress process model, and to assess the extent to which these variables account for observed social status differences in risk. Table 3 presents results from a series of logit regression analyses addressed to this aim. Model 1 confirms that age and race/ethnicity make significant independent contributions to the prediction of suicidal ideation, with African Americans and those of older age at lower risk compared to non-Hispanic whites and younger persons. Model 2 indicates that these associations are independent of disability status and that the relationship between disability status and lifetime risk for suicidal ideation is independent of social status differences in risk. Models 3 through 5 evaluate the role of stress process variables in explaining differences in risk for suicidal ideation across disability and social statuses. The results in Model 3 reveal three interesting findings. First, they indicate that higher levels of

social stress are strongly associated with increased risk for suicidal ideation. The proportion of variance accounted for doubles, from 12.8% in the previous equation to 25.6% in Model 3. Second, variations in stress exposure explain 31% of the disability—ideation relationship, suggesting that differences in stress exposure constitute one factor underlying elevated risk for suicidal ideation among those with physical limitations. Third, controlling for social stress explains almost three quarters (72%) of the association between age and risk for suicidal ideation. Models 4 and 5 show both social support and emotional reliance to be associated with suicidal thoughts, with those who perceive low levels of social support from others and those high in emotional reliance at increased risk. Considered together (Model 6), the stress process components account for about 38 percent of the association observed between physical disability and suicide ideation. However, social stress is the only stress process variable that remains a significant independent predictor of suicidal ideation. Models 7 and 8 confirm a strong linkage between lifetime history of psychiatric disorder and risk for suicidal ideation. As noted above, preliminary analyses revealed that the likelihood of remembering and reporting an experience of suicide ideation varied with level of depressive symptoms at the time of interview.

**TABLE 3**  
*Lifetime Suicidal Ideation Regressed on Physical Disability and Stress Process Components (N = 1,768)*

Study Variable	1	2	3	4	5	6	7	8	9
Physical Disability	—	-1.076***	.754***	1.039***	.933***	.672**	.583*	.582*	.571*
African American <sup>a</sup>	-.728**	-.736**	-1.072***	-.677**	-.695**	-.999***	-.760**	-.854**	-.743**
Cuban	-.525	-.430	-.342	-.449	-.544	-.352	-.500	-.356	-.609
Other Hispanic	-.297	-.181	-.144	-.219	-.308	-.158	-.238	-.100	-.269
Female	.267	.307	.368	.324	.244	.316	.177	.333	.131
Age	-.019***	-.022***	-.006	-.020***	-.021***	-.006	-.006	-.005	-.005
Socioeconomic Status	.031	.131	.074	.156	.244	.156	.152	.137	.168
Previously Married <sup>b</sup>	.346	.331	.428	.319	.397	.498*	.498	.483	.527*
Never Married	.401	.397	.698*	.428	.391	.709*	.818*	.675*	.859**
Social Stress			.870***			.822***	.516***	.706***	.440***
Social Support				-.274*		-.096	-.204	-.126	-.118
Mastery					-.036	-.015	.007	-.012	.025
Self-Esteem					-.025	-.006	-.009	-.001	.019
Emotional Reliance					.056*	.040	.034	.031	.023
Lifetime Depression							1.237***		1.130***
Lifetime PTSD							1.285***		1.276***
Three or More Disorders								1.515***	
CES-D									.039***
Intercept	-1.360**	-1.637***	-2.789***	-1.740***	-1.060	-3.017**	-3.607**	-3.184**	-5.142***
Pseudo R <sup>2c</sup>	.064	.128	.256	.136	.167	.267	.284	.258	.296

Notes. <sup>a</sup>White Non-Hispanic respondents comprise the race/ethnicity reference category.  
<sup>b</sup>Married respondents comprise the marital status reference category.  
<sup>c</sup>The McKelvey and Zavoina Pseudo R<sup>2</sup> is employed to provide an estimate of model fit.  
 \*p < .05; \*\*p < .01; \*\*\*p < .001.

To ensure that such State Dependence (also referred to as mood congruency) does not account for the results presented, level of depressive symptoms, estimated by the Center for Epidemiology Studies Depression scale, are controlled in Model 8. The absence of substantial changes in observed associations allows the conclusion that state dependence does not constitute a competing explanation for any reported findings.

**DISCUSSION**

To our knowledge, this is the first study to specifically focus on physical disability as a risk factor for suicidal ideation. Our findings suggest that disability status is a strong predictor of suicide ideation risk, net of sociodemographic factors and psychiatric

disorder. Rates of lifetime ideation among respondents with a physical limitation were more than twice as high compared to rates among nondisabled study participants. The elevation in risk associated with physical limitation was observed within most sociodemographic subgroups, with two notable exceptions—older people and married people. Also as we expected, many elements of the stress process model differentiated between those who ever seriously considered suicide and those without such a history, especially among individuals with a physical limitation. The stress process model clearly offers predictive utility in understanding risk and protective influences on suicidality. Of all the components considered, social stress was the strongest predictor of ideation and explained the largest portion of the heightened risk among the physically disabled. Also, stress



exposure accounted for 12.8% of the variance in reports of lifetime suicidal ideation, net of disability status and other sociodemographic risk factors. Although social support and emotional reliance were associated with ideation risk when demographic factors were controlled, they did not make a significant independent contribution with stress exposure included in the model.

Our examination of the risk significance of socio-demographic variables revealed a contrast in risk of ideation across age. Younger individuals (18 to 49 years of age), especially those with a physical limitation, are at greater risk of reporting suicidal thoughts compared to older individuals (those older than 50 years of age). Regression analyses revealed that variations in stress exposure mediated a majority of the association between age and lifetime risk for suicidal ideation. This finding suggests that stress exposure is an important risk factor for suicidal ideation in young- and middle-aged adults; perceptions of burdensomeness and isolation may function as specific instantiations of social stress. Regression analyses also indicated that white non-Hispanic respondents are at an elevated risk compared with African Americans. This finding differs from previous research from the National Comorbidity Study that documents similar odds across racial categories (Kessler et al., 1999). This inconsistency may be attributable to the location and/or sample composition of our study.

Given the strength and resilience of the physical disability—ideation association, it is interesting to consider the two subgroups in which this association was not detected, older people and married people. A recent model of suicidal behavior claims that the final common pathway for severe suicidal ideation involves the combination of perceptions of burdening others and feelings of isolation and alienation (Joiner, 2005). Physical disability may instill perceptions of burdensomeness particularly in relatively younger people, because disability may impede age-specific role functioning more so in younger than in older people. Disability may also reduce activities leading to a sense of belonging

with others, an effect that may be offset by marriage.

#### *Limitations and Strengths of the Study*

There are a number of limitations intrinsic to this study. First, our analysis does not establish temporal ordering between physical disability, stress process components and suicidal ideation. This is an important limitation to the study because we cannot examine whether important risk factors, such as disability and stress exposure, preceded the onset of suicidal thoughts. This issue could be partially addressed by studying recent suicidal thoughts. Although recent thoughts were evaluated, positive reports of these experiences were too low ( $n < 20$ ) to conduct a stable statistical analysis of our study aims. Future research should reexamine the associations observed in this study with longitudinal data that includes a sufficient number of reports of recent ideations.

Second, our measure of suicide ideation was based on a single item. Further research is needed to replicate this study's findings with a multi-item scale of suicidality that has more favorable reliability and validity characteristics (Joiner, Pfaff, & Acres, 2002). Third, we are unable to determine the extent to which one potential source of error in studies of suicide, survival bias, influences the results we obtained. Survival bias occurs when a study design fails to take into account the time period of exposure prior to its initiation. Identification of the mechanisms of risk will be distorted if an excessive number of exposed persons die before the study's sample is drawn. Survival bias is magnified when this time window is longer (Zhou, Rahme, Abrahamowicz, & Pilote, 2005). Fourth, although a host of compelling covariates were assessed and statistically controlled, our assessment protocol did not exhaust the universe of variables that may account for the physical disability—suicidal ideation association. An interesting and understudied candidate in this regard is sleep problems. Various physical conditions can disrupt sleep of course, and sleep problems are a well known aspect of

suicide-related conditions like mood disorders. What has become clear in recent research (e.g., Bernert, Joiner, Cukrowicz, Schmidt, & Krakow, 2005) is that sleep problems represent a risk factor for suicidal ideation and behavior even beyond variance accounted for by depression. Sleep disruption may therefore represent an additional mechanism (additional to social stress exposure) through which physical disability affects suicidal ideation.

Despite these limitations, our study has several strengths. First, it employs a large multi-ethnic sample that is representative of those living with physical limitations in the Miami-Dade community and of their nondisabled counterparts, providing an excellent opportunity to examine the risk associated with physical disability. Strong covariates were included in analyses, and we were able to verify that the physical disability—suicidal ideation association was not spuriously at-

tributable to variations in risk associated with social status, history of psychiatric disorder, or current levels of depression. This study also included a more comprehensive measure of stress exposure than has been typical in previous research on suicidal ideation. The importance of including a broader spectrum of stressful experiences is demonstrated by the strong relationships observed in this study between increased exposure and risk for suicidal thoughts.

An important public health implication of these findings is that the risk of suicidal ideation is substantially greater among persons with physical limitations than among those without them. Screening for suicide risk in health care settings among those with physical limitations seems indicated, especially insofar as such screenings can be very brief (Joiner et al., 2002) and have been clearly shown not to be iatrogenic (Gould et al., 2005).

## APPENDIX A

### Partial Associations Between Lifetime Psychiatric Disorder and Lifetime Suicidal Ideation

Psychiatric Disorder	Total (N = 1,768)	Nondisabled (n = 1,276)	Disabled (492)
Depressive Disorder	8.0 (6.3–13.8)	8.3 (4.6–14.9)	6.0 (3.2–11.3)
Anxiety Disorder	6.4 (4.5–11.4)	6.2 (2.9–13.5)	5.0 (2.3–10.7)
Substance Disorder	4.0 (2.6– 5.7)	3.3 (1.8– 6.3)	3.4 (1.7– 6.7)
Behavioral Disorder	3.5 (2.4– 6.4)	3.0 (1.3– 6.9)	3.2 (1.4– 7.1)
Posttraumatic Stress Disorder	9.3 (7.3–13.9)	11.6 (6.5–20.6)	6.9 (3.3–14.5)
Two or More Psychiatric Disorders	9.4 (7.4–14.8)	9.6 (5.4–17.0)	7.0 (3.7–13.0)
Three or More Psychiatric Disorders	15.7 (9.1–28.0)	17.2 (7.1–41.9)	9.7 (4.3–21.4)

Notes. Odds ratios are computed one at a time, controlling on age, gender, race/ethnicity, and socioeconomic status; (95% Confidence Interval)

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Manuscript Received: February 29, 2008  
Revision Accepted: May 29, 2008