

Are Suicidal Behaviors Contagious in Adolescence? Using Longitudinal Data to Examine Suicide Suggestion

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Abstract

Durkheim argued that strong social relationships protect individuals from suicide. We posit, however, that strong social relationships also have the potential to increase individuals' vulnerability when they expose people to suicidality. Using three waves of data from the National Longitudinal Study of Adolescent Health, we evaluate whether new suicidal thoughts and attempts are in part responses to exposure to role models' suicide attempts, specifically friends and family. We find that role models' suicide attempts do in fact trigger new suicidal thoughts, and in some cases attempts, even after significant controls are introduced. Moreover, we find these effects fade with time, girls are more vulnerable to them than boys, and the relationship to the role model—for teenagers at least—matters. Friends appear to be more salient role models for both boys and girls. Our findings suggest that exposure to suicidal behaviors in significant others may teach individuals new ways to deal with emotional distress, namely by becoming suicidal. This reinforces the idea that the structure—and content—of social networks conditions their role in preventing suicidality. Social ties can be conduits of not just social support, but also antisocial behaviors, like suicidality.

Keywords

suicide, social networks, suicide suggestion, Durkheim, gender, Add Health

Understanding suicide has been essential to the sociological enterprise since Durkheim ([1897] 1951) wrote his famous monograph, arguing that groups that integrated and (morally) regulated their members offered protective benefits against suicide. Durkheimian mechanisms remain highly relevant (cf. Maimon and Kuhl 2008; Pescosolido and Georgianna 1989; Thorlindsson and Bjarnason 1998), but emphasis on *suicide suggestion*, or the effect a role model's suicidal behavior has on an observer's suicidality, has become increasingly essential to the sociological understanding of suicide (e.g., Gould 2001; Phillips 1974; Stack 2003, 2009).

Whereas Durkheim assumed that social integration protected individuals, suicide suggestion demonstrates that suicidality can spread through the very ties that Durkheim theorized as protective. This apparent contradiction is not such a problem for modern interpretations of Durkheim's theory that focus on the structure

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of social ties themselves, and how the networks individuals are embedded within produce the protective benefits Durkheim observed (Bearman 1991; Pescosolido 1990; Wray, Colen, and Pescosolido 2011). It is possible to imagine social ties as capable of both social support and social harm (Baller and Richardson 2009; Haynie 2001; Pescosolido 1990). Durkheim was right that collective solidarity is often protective, but we argue that the behaviors, values, and emotions embedded in network ties must be elaborated to truly understand how social relationships shape individuals' life chances.¹ This subtle shift provides an opportunity to integrate two equally important, but often unnecessarily separate, realms in the sociology of suicide: the literature on suicide suggestion and the literature on social integration.

The existing literature on suicide suggestion demonstrates that concern over the emotions (suicidality) and behaviors (suicides) embedded in social networks is warranted. Suicides often occur in clusters, with spikes in suicide rates following media coverage of suicides (Stack 2003, 2005, 2009), so much so that a group of public health agencies (including the National Institute of Mental Health [NIMH]) issued guidelines for how the media should report on suicides so as to limit their spread (Suicide Prevention Resource Center [SPRC] 2013). Less research has examined how suicides spread through personal role models, but studies show a robust association between a friend's (and sometimes family member's) suicidal behavior and that of the person exposed to it (Bearman and Moody 2004; Bjarnason 1994; Liu 2006; Niederkrotenthaler et al. 2012; Thorlindsson and Bjarnason 1998). However, these studies often fail to address the critical questions of how, when, and for whom does suggestion matter?

With this study, we employ three waves of data from the National Longitudinal Study of Adolescent Health to examine these questions. By using longitudinal data rich in measures of adolescent life, we investigate the role suicide suggestion plays in the suicide process, independent of other measures of social

integration and psychological well-being. We tease out nuances related to the harmful side of social integration by shedding light on four major gaps in the literature: (1) whether suicide suggestion is associated with the development of suicidal thoughts among individuals who reported no suicidal thoughts at the time a role model attempted suicide; (2) whether the effects of suicide suggestion fade with time; (3) whether the relationship between the role model and respondent matters; and (4) whether there are differences between boys and girls.

THEORETICAL BACKGROUND

The Spread of Suicide

Beginning with Phillips's (1974) groundbreaking work, suicide suggestion studies typically examine (1) the association between celebrity suicides and national and local suicide rates (Gould 2001; Stack 2003, 2005), (2) the association between fictionalized media suicides and national and local rates (e.g., Stack 2009), and (3) the apparent geographic and temporal clustering of suicides (e.g., Baller and Richardson 2002; Gould, Wallenstein, and Kleinman 1990). A few studies have also investigated the effect a role model's suicidal behavior has on friends or family members exposed to it. The logic of these studies is predicated on social psychological assumptions. Significant others or persons labeled as members of a reference group with whom we identify are far more likely to influence and shape behavior than are nonsignificant others or outsiders (Turner 2010). Additionally, direct ties infused with socioemotional meanings can act as conduits for the spread of behavioral norms (Goffman 1959) and positive *and* negative affect, which motivate the reproduction of these behavioral norms (Lawler 2006).

Suicide suggestion and the media. In a comprehensive review of the suicide suggestion literature, Stack (2005:121) estimates that about one-third of suicide cases in the

United States involve “suicidal behavior following the dissemination of a suicidal model in the media.” Models may be real celebrities like Marilyn Monroe or fictionalized characters such as those found in popular novels or television shows. The length of exposure and the status of the role model appear to matter: on average, publicized celebrity suicides produce a 2.51 percent spike in aggregate rates, whereas Marilyn Monroe’s suicide, a high status and highly publicized suicide, was followed by a 13 percent spike in the U.S. suicide rate (Phillips 1974; Stack 2003). The evidence concerning effects of fictionalized suicides, such as those found occasionally in television series (Schmidtke and Hafner 1988), is less consistent (e.g., Niederkrontenthaler and Sonneck 2007), but a recent meta-analysis found youths are particularly at risk of suicide suggestion via fictional suicides (Stack 2009).

Spikes following celebrity suicides are confined geographically to the subpopulation exposed to the suicide—for example, local newspapers should only affect their readership, whereas nationally televised shows should reach more people. Furthermore, research shows that temporal effects of media exposure vary to some degree, typically ranging from two weeks to a month (Phillips 1974; Stack 1987). To date, these studies have had a difficult time determining whether suggestion plays a role above and beyond individuals’ personal circumstances: finding an association between media and suicide rates “does not necessarily identify [suggestion] as the underlying mechanism” (Gould et al. 1990:76). If suicide suggestion plays a role in the suicide process, the question is: does it have an effect above and beyond other risk factors for suicide, such as suicidal thoughts or depression prior to exposure to media coverage of a suicide?

Suicide suggestion via personal role models. Like media exposure suggestion studies, studies of personal role models focus on demonstrating a link between a role model’s and the exposed individual’s suicidal

behaviors. The majority of these studies focus on adolescent suicide, perhaps because adolescent suicide has tripled since the 1950s and thus represents a serious public health problem (NIMH 2003). Adolescents may also be particularly vulnerable to suicide suggestion: adolescents are particularly socially conscious—social status and social relationships are a major focus of their daily lives. Moreover, teenagers are greatly influenced by their peers’ values and behaviors (Giordano 2003), which may increase their vulnerability to suicide epidemics. Finally, adolescents are unique in that their sense of self is still forming, so they are more malleable than adults (Crosnoe 2000; Crosnoe and Johnson 2011). Any insights into factors contributing to the development of suicidality are thus crucial to teen suicide prevention.

Generally, studies of personal role models show that having a friend or family member exhibit suicidal behavior is positively associated with an exposed adolescent’s own suicidality (Bjarnason and Thorlindsson 1994; Bridge, Goldstein, and Brent 2006; Evans, Hawton, and Rodham 2004), even after controlling for other measures of social integration, regulation, and psychological distress (e.g., Bearman and Moody 2004; Bjarnason 1994). A few studies also demonstrate a positive association between exposure to suicidal behavior in role models and an individual’s likelihood of attempting suicide (Bearman and Moody 2004). These studies add to our understanding of sociological influences on suicide, but they fail to examine who is most vulnerable to suggestion and how long effects may linger, and they are often limited by the use of cross-sectional data.

Three studies employ longitudinal data and thus shed further light on suicide suggestion within the adolescent suicide process. Brent and colleagues (1989) had the rare opportunity to collect data immediately following a suicide at a high school. Although they were unable to measure students’ predispositions to suicide prior to a peer’s suicide, their findings suggest that suicide suggestion can spread rapidly and then gradually lose some

of its effect. More recently, Niederkrotenthaler and colleagues (2012) found that young children exposed to a parent's suicidal behavior were far more likely to develop suicidal behaviors over time than were their counterparts. This work, however, is primarily epidemiological and fails to control for potentially significant confounding factors, such as social integration. Finally, Thompson and Light (2011) examined which factors are associated with adolescent nonfatal suicide attempts and found that role models' attempts significantly increase adolescents' likelihood of attempting suicide, net of respondents' histories of suicidal thoughts and many other factors. These studies provide insights into exposure to a role model's suicidal behavior, but questions of who is most vulnerable and how long that vulnerability lasts remain open, and the role suggestion plays as an aspect of social integration remains unacknowledged.

Similarity between individuals and role models. A primary limitation in the existing literature on suicide suggestion is its failure to determine whether the similarity between friends' or family members' suicidal behaviors is due to the tendency for individuals to form friendships with people they are similar to. This proverbial "birds of a feather" is often the case for teens, who select friends and peer groups based on how similar potential friends are to themselves (Crosnoe, Frank, and Mueller 2008; Joyner and Kao 2000). Research shows that adolescent friendships tend to be homophilous in terms of depression levels (Schaefer, Kornienko, and Fox 2011) and aggression (Cairns et al. 1988). The effect of suicide suggestion on an adolescent's suicidal behaviors may thus be due to unobserved preexisting similarities between friends. To address this limitation, we focus on the development of suicidal behaviors in a sample of adolescents with no documented history of suicidality, to avoid (to the extent possible with survey data) confounding the observed effect of suicide suggestion with selection into friendships. Answering this crucial question, whether suicide suggestion

contributes to the development of suicidal behaviors, is a central goal of this study.

Temporal limits. In the process of discerning how suggestion shapes adolescent suicidality, it is useful to consider whether effects of suggestion via personal role models linger as time passes, and for whom. Given past research, suggestive effects likely have temporal limitations. Previous studies on effects of media exposure generally find that spikes in suicide rates last between two and four weeks (Phillips 1974; Stack 1987). Significant others tend to have a greater impact on individuals than do nonsignificant others (Turner 2010), so it is reasonable to expect effects of personal role models will last longer than suicides publicized in the media. We thus utilize the Add Health survey to test whether the impact of a role model's suicide attempt is observable after approximately one year and six years.

Family versus friends. Generally, studies of suicide suggestion do not distinguish between effects of a family member's versus a friend's suicide attempt on those exposed. Given that past research demonstrates that "the influence of friends surpasses that of parents" by mid-adolescence (Crosnoe 2000:378), and friends' influence is strongly linked with teen delinquency, health behaviors, and pro-social behaviors (Frank et al. 2008; Giordano 2003; Haynie 2001; Mueller et al. 2010), we would expect to see differences based on an individual's relationship to the role model. It is plausible, given the extant research on adolescents and peer influence, that a friend's suicidal behavior provides a more salient model for imitating than would family. We thus analyze the two types of role models separately.

Gender differences. The final aspect deserving greater attention is potential gender differences in suggestion and suicidality. Little research emphasizes potential gender differences in how adolescents develop suicidal behaviors, despite the fact that key differences exist in suicidal behaviors between

adolescent boys and girls (Baca-Garcia et al. 2008); for example, girls are more likely than boys to report nonfatal suicide attempts, whereas boys are more likely to experience fatal suicides. Another important reason to consider how suicide suggestion affects boys and girls stems from differences in boys' and girls' friendships. Girls tend to have fewer, but more intimate, emotionally laden friendships, whereas boys tend to maintain less emotional and more diffuse networks focused around shared activities (Crosnoe 2000). Moreover, girls tend to be more sensitive to others' opinions (Gilligan 1982) and are more easily influenced by peers than are boys (Maccoby 2002). These findings suggest girls may be more susceptible than boys to role models' suicide attempts.

In summary, this study shifts the sociological focus away from the protective nature of social ties toward the potential harm these ties can have on individuals. Specifically, we elaborate how exposure to suicidal behaviors shapes adolescent suicidality by identifying how, when, and for whom suicide suggestion matters. Our strategy includes (1) examining the development of suicidal behaviors in a sample of youth with no suicidal behaviors at Time I; (2) determining how long the effect of suggestion lasts; and if (3) the type of role model or (4) gender makes a difference in the process. Answers to these questions will help us understand how social relationships work in daily life to both protect and, sometimes, put individuals at risk of suicidality, thereby moving us closer to a robust sociological theory of suicide.

METHODS

Data

This study employs data from Waves I, II, and III of the National Longitudinal Study of Adolescent Health (Add Health). Add Health contains a nationally representative sample of U.S. adolescents in grades 7 through 12 in 132 middle and high schools in 80 different communities. From a list of all schools containing an 11th grade in the United States,

Add Health selected a nationally representative sample of schools using a school-based, cluster sampling design, with the sample stratified by region, urbanicity, school type, ethnic composition, and size.

The preliminary in-school survey collected data from all students in all Add Health high schools ($n = 90,118$ students) in 1994 to 1995; from this sample, a nationally representative subsample was interviewed at Wave I ($n = 20,745$), shortly after the in-school survey. Wave II followed in 1996 and collected information from 14,738 Wave I participants. Some groups of respondents were generally not followed up at Wave II; the largest of these were Wave I 12th graders, who had generally graduated high school by Wave II. Wave III was collected in 2001 to 2002 and followed up the Wave I in-home respondents (including respondents excluded from Wave II) who were then approximately age 18 to 23 years. Additional information about Add Health can be found in Harris and colleagues (2009).

Sample Selection

We used several sample selection filters to produce analytic samples that allow us to assess suicide suggestion in adolescence. First, we selected respondents with valid sample weights so we could properly account for the complex sampling frame of the Add Health data. Second, we used longitudinal data analysis; as such, we restricted our sample to adolescents who participated in Waves I and II of Add Health for our analyses of Wave II outcomes, and Waves I, II, and III for our analyses of Wave III outcomes. Among respondents, 10,828 had valid sample weights and participated in all three waves of Add Health. Our third selection filter selected only adolescents with no suicidal thoughts or attempts at Wave I, so the time order of events is preserved such that we can determine whether suicide suggestion plays a role above and beyond preexisting vulnerabilities to suicidality. This restriction reduced our analytic sample to 9,309 respondents. With this sample restriction, our models are not estimating the

potential for role models to maintain or dissolve an adolescent's suicidal thoughts. Instead, our models estimate whether role models' behaviors at Wave I are associated with the development of previously undocumented suicidal thoughts and attempts at later waves. This also allows us to control for potential unmeasured factors that may shape both who adolescents choose as friends and their vulnerability to suicide (following the logic of classic ANCOVA; cf. Shadish, Campbell, and Cook 2002). Our final selection filter excluded adolescents missing any key independent variables.

These restrictions have the potential to bias our sample, but they also enable our analysis of critical aspects of suicidal behaviors in adolescence. To assess any potential bias, Table 1 presents descriptive statistics for the entire Wave I sample and our Wave II and Wave III analytic samples. The only substantial difference between the Wave I Add Health sample and our analytic sample is the lower incidence of suicidal thoughts and attempts at Waves II and III due to our restricting our analyses to adolescents with no suicidal thoughts at Wave I. Our analytic samples do not vary substantially from the entire Wave I sample in terms of average levels of emotional distress or demographic variables.

Measures

Dependent variables. We analyze two dependent variables: *suicidal ideation* and *suicide attempts* at Wave II and Wave III. *Suicidal ideation* is based on adolescents' responses to the question: "During the past 12 months, did you ever seriously think about committing suicide?" Adolescents who answered "yes" were coded 1 on a dichotomous outcome indicating suicidal ideation. Adolescents who reported having suicidal thoughts were then asked, "During the past 12 months, how many times did you actually attempt suicide?" Answers ranged from 0 (0 times) to four (six or more times). We recoded these responses into a dichotomous variable where 1 indicates a report of at least one suicide

attempt in the past 12 months and 0 indicates no attempts. Adolescents who reported no suicidal thoughts were also coded 0 on *suicide attempts*. These variables were asked at all three waves.

Independent variables. Our first key independent variable, one of two ways we measure suicide suggestion, is *friend suicide attempt* and is based on adolescents' responses to the question: "Have any of your friends tried to kill themselves during the past 12 months?" Adolescents who responded "yes" were coded 1 on a dichotomous variable. This question was asked at all waves. For models predicting suicidal thoughts and attempts at Wave II, we rely on adolescents' responses at Wave I to preserve time order in these data. For models predicting Wave III dependent variables, we use adolescents' responses to this question at Wave II. Our second key independent measure of suicide suggestion is *family suicide attempt*. The treatment of this variable is identical to *friend suicide attempt* and is based on adolescents' responses to the question: "Have any of your family tried to kill themselves during the past 12 months?"

Our models also control for protective factors for suicide suggested by prior research. Following Durkheim's ideas about the importance of social integration as a protective factor for suicide, we measure adolescents' family integration, how close they feel to their friends, and their religious attendance. Our *family integration scale* (Cronbach's alpha = .769) is based on four items that measure how integrated adolescents are in their families (Bjarnason 1994). Adolescents were asked how much they feel their parents care about them, how much people in their family understand them, whether they have fun with their family, and whether their family pays attention to them. Responses were coded so that a higher value on the scale indicates a higher feeling of family caring. Our measure of adolescents' relationships with their friends, *friends care*, is based on adolescents' responses to the question, "How much do you feel that your friends care about you?" Higher

Table 1. Weighted Descriptive Statistics for Key Variables

	Full Wave 1 Sample (mean)		Wave 2 Analytic Sample (mean)		Wave 3 Analytic Sample (mean)	
	Boys	Girls	Boys	Girls	Boys	Girls
Suicide Ideation, W1	.103	.165	.000	.000	.000	.000
Suicide Attempt, W1	.021	.057	.000	.000	.000	.000
Suicide Ideation, W2	.083	.146	.052	.092	.051	.091
Suicide Attempt, W2	.019	.051	.009	.026	.006	.026
Suicide Ideation, W3	.068	.072	.060	.060	.057	.061
Suicide Attempt, W3	.010	.025	.008	.021	.009	.020
Age, W1	15.180 (1.610)	15.370 (1.710)	15.290 (1.620)	15.120 (1.580)	15.130 (1.530)	15.010 (1.530)
White	.667	.676	.673	.680	.667	.673
African American	.138	.151	.138	.157	.146	.162
Asian American	.044	.038	.040	.036	.039	.035
Hispanic	.118	.109	.115	.105	.115	.108
Other Race/Ethnicity	.033	.025	.034	.022	.033	.021
Parents' Education	2.867 (1.284)	2.853 (1.261)	2.880 (1.236)	2.867 (1.239)	2.935 (1.240)	2.910 (1.248)
Lives with Two Biological Parents	.581	.571	.594	.588	.590	.602
Same-Sex Attraction, W1	.075	.048	.065	.039	.066	.038
GPA, W1	2.727 (.798)	2.925 (.764)	2.751 (.766)	2.972 (.747)	2.780 (.753)	3.001 (.740)
Emotional Distress, W1	28.933 (6.868)	30.813 (8.137)	28.110 (5.910)	29.423 (6.990)	27.910 (5.830)	29.110 (6.800)
N	5,042	5,694	4,301	4,523	3,855	4,075

Note: Standard deviations are in parentheses.

Source: The National Longitudinal Study of Adolescent Health.

values on this measure indicate a higher feeling of caring friends. *Religious attendance* measures how often adolescents attend religious services. Responses range from “never” to “once a week, or more.” Items were coded so that a higher value on this measure indicates more frequent religious attendance.

In addition to measures of social integration, we control for several known risk factors for suicide. These include adolescents' reports of *same-sex attraction* (at Wave I) or identity as gay, lesbian, or bisexual (which was only collected at Wave III). At Wave I, adolescents were asked whether they had “ever had a romantic attraction to a female?” or “. . . to a male?” These questions were used to identify adolescents who experienced some

form of same-sex attraction (Pearson, Muller, and Wilkinson 2007). At Wave III, adolescents were asked to choose a description that fit their sexual identity, from 100 percent homosexual to 100 percent heterosexual (with not attracted to males or females as an option). Adolescents who reported being “bisexual,” “mostly homosexual (gay), but somewhat attracted to people of the opposite sex,” or “100 percent homosexual (gay)” were coded 1. Heterosexual, asexual, and mostly heterosexual adolescents were coded 0.

Because emotional distress may increase an adolescent's likelihood of becoming suicidal, we control for *emotional distress* in all models. *Emotional distress* is measured by a 19-item abridged Center for Epidemiological

Studies-Depression (CESD) scale (Cronbach's $\alpha = .873$). Add Health, at Waves I and II, posed a series of questions asking respondents how often "you didn't feel like eating, your appetite was poor," "you felt that you were just as good as other people," and "you felt depressed." Positive items were reverse coded, so a higher score on every question indicates higher emotional distress. Items were then summed for adolescents who provided a valid answer to every question in the scale.

Finally, all models control for several demographic and personal characteristics, including educational attainment measures, family structure, age, race/ethnicity, and parents' education levels. Overall *grade point average* (GPA) is a self-reported measure and has the standard range of 0 to 4 (indicating the highest possible grade). An indicator for whether the adolescent successfully graduated from high school and if they attended some college is included in the models predicting suicidal behaviors at Wave III. Because of the age range of the sample, some students had not had time to complete a college degree; however, all had an opportunity to begin their college coursework and graduate from high school.

Family structure captures whether respondents lived in a two-biological-parent family, a single-parent family, a family that includes step-parents, or another family type at Wave I. *Race/ethnicity* was coded as five dichotomous variables: Latino/a, Black, Asian American, and other race or ethnicity, with White as the reference category. We took *parents' education* from the parent questionnaire and used the maximum value in the case of two parents. If this information was missing from the parent questionnaire, we used students' reports of their parents' education level. We coded parents' education as (0) never went to school; (1) less than high school graduation; (2) high school diploma or equivalent; (3) some college, but did not graduate; (4) graduated from a college or university; and (5) professional training beyond a four-year college or university.

Analytic Plan

Our goal with these analyses is to investigate whether a role model's suicide attempt is associated with the development of suicidal behaviors at Times II and III in a sample of adolescents with no suicidal behaviors at Time I. We also examine how long the increase in vulnerability lasts after exposure to a role model's suicide attempt, whether the type of role model makes a difference, and if there is variation in these processes by gender. To investigate these questions we estimate a series of nested logistic regression models with a sample of adolescents with no history of suicidal thoughts at Wave I. Because we are interested in (and anticipate based on prior literature) gender differences in what leads adolescents to contemplate suicide, we estimate all models separately by gender. As a first step, we estimate the bivariate relationships between a role model's suicide attempt (at Wave I or II) and an adolescent's likelihood of suicide ideation and attempt (at Waves II and III) to determine whether suicide suggestion is part of the process of developing suicidal behaviors over time. Next, we add a set of demographic, personal, and social characteristics to the model to determine how robust the impact of suicide suggestion is to potentially confounding risk and protective factors.²

Because Add Health data were collected using a complex survey design (described earlier), we estimate all models using the SAS SurveyLogistic Procedure (An 2002) to obtain appropriate estimates and standard errors (Bell et al. 2012). The survey logistic procedure is similar to traditional logistic regression, except for the handling of the variance. We estimated variance using a Taylor expansion approximation that computes variances within each stratum and pools estimates together (An 2002). This method accounts for dependencies within the data due to the complex survey design. Our models also include normalized sample weights to compensate for the substantial oversampling of certain populations. These weights render our analyses more representative of the U.S. population than would unweighted

analyses that fail to correct for Add Health's oversampled populations.

RESULTS

To begin our investigation of suicide suggestion, we first examine the roles of family members' and friends' suicide attempts in adolescent girls' and boys' suicidal behaviors at Wave II, before turning to boys' and girls' behaviors at Wave III. Among boys, reports of a new suicidal attempt were extremely rare; only 1 percent of boys reported a suicide attempt at Wave II after reporting no suicidal thoughts at Wave I. For this reason, we focus most heavily on suicidal thoughts and examine suicide attempts only among adolescent girls. The models for boys' suicidal attempts are available from the authors by request.

Suicidal Behaviors at Wave II

Table 2 presents odds ratios from logistic regressions predicting suicide ideation and suicide attempts for girls and boys. As a first step, we estimate the bivariate relationship between family members' suicide attempts (Wave I) and adolescents' suicidal thoughts and attempts a year later (Wave II) (see Models 1, 4, and 7 in Table 2). A family member's attempted suicide (Model 1) significantly increases the likelihood that adolescent girls report suicidal thoughts at Wave II; however, it is not associated with suicide attempts at Wave II (Model 4). On average, girls who reported that a family member attempted suicide at Wave I are 2.994 times more likely to report suicidal thoughts at Wave II than are girls who did not experience a family member's suicide attempt. This pattern is not found among boys. For boys, we find no significant relationship between a family member's suicide attempt and boys' likelihood of reporting suicidal thoughts. This is our first piece of evidence for gender differences in suicide suggestion.

Next we turn to friends as role models for suicide suggestion. For girls, a friend's suicide attempt significantly increases their likelihood of reporting suicidal thoughts (Model 2) and attempts (Model 5). For boys,

experiencing a friend's suicide attempt has a significant and positive relationship to boys' likelihood of reporting suicidal thoughts (Model 8). These significant bivariate relationships indicate that *who* the role model is may condition the likelihood that suicides spread through social relationships in gendered ways. Our next step is to evaluate whether these relationships maintain their significance once potential risk and protective factors are held constant in our models.

Substantively, our findings do not change after the addition of important controls.³ On average, adolescent girls are 2.129 times more likely to report suicidal *thoughts* after experiencing a family member's attempted suicide, and 1.561 times more likely after experiencing a friend's suicide attempt, net of all other variables (Model 3). Girls' reports of suicide *attempts*, on average, are significantly related to friends' suicide attempts, but not family members' attempts, net of all other variables, confirming in Model 6 the bivariate relationships observed in Models 4 and 5. For girls, the relationship between suicide suggestion, via family or friend role models, is robust to many vital risk and protective factors for suicide.

For boys, the story is similar. The bivariate relationships observed in Models 7 and 8 are robust to the addition of control variables. Boys remain affected by a friend's suicide attempt at Wave I. Specifically, a friend's suicide attempt renders boys 1.649 times more likely to report suicidal thoughts at Wave II. The suicide attempt of a family member remains insignificant (confirming associations found in Model 7).

Overall, these findings suggest that suicide suggestion is associated with the development of suicidal behaviors within a year or so of a role model's suicide attempt, particularly when the role model is a friend. Significant gender differences do emerge: girls appear more sensitive than boys to familial role models.

Suicidal Behaviors at Wave III

In the analyses presented in Table 3, we investigate the impact a role model's suicide attempt at Wave II has on respondents' suicidal thoughts and attempts at Wave III, as

Table 2. Odds Ratios from Models Predicting Suicidal Thoughts and Attempts among Adolescents at Wave II

	Girls						Boys		
	Suicide Ideation			Suicide Attempt			Suicide Ideation		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Suicide Suggestion									
Family Suicide Attempt	2.994***		2.129**	1.069		.535	1.263		.947
Friend Suicide Attempt		2.054***	1.561**		3.214***	2.577***		1.935**	1.649*
Background									
Age			.733***			.679***			.979
African American			.625*			1.041			.809
Asian American			.966			1.580			.741
Latino\A			.811			1.082			.863
Other Race or Ethnicity			.692			1.332			1.019
Parents' Education Level			.967			.865			1.060
Same-Sex Attraction			1.660			1.281			1.499
GPA			.870			.967			.796
Social Integration									
Religious Attendance			.996			.900			.969
Single-Parent Family			1.499*			1.145			.943
Step-Parent Family			1.295			1.868			.866
Other Family Structure			1.050			1.578			1.817
Family Integration Scale			.877			.681			.770
Friends Care			1.204			1.216			1.404**
Psychological Factors									
Emotional Distress			1.067***			1.067***			1.038**
-2 Log Likelihood	2708.714	2698.139	2499.105	1073.977	1039.891	947.583	1729.374	1717.750	1672.626
Response Profile (n=1/n=0)	351/4172	351/4172	351/4172	100/4423	100/4423	100/4423	222/4079	222/4079	222/4079
N	4,523	4,523	4,523	4,523	4,523	4,523	4,301	4,301	4,301

Note: All independent variables measured at Wave I.
Source: The National Longitudinal Study of Adolescent Health.
*p < .05; **p < .01; ***p < .001 (two-tailed tests).

Table 3. Odds Ratios from Models Predicting Suicidal Thoughts and Attempts among Adolescents at Wave III

	Girls						Boys		
	Suicide Ideation			Suicide Attempt			Suicide Ideation		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Suicide Suggestion									
Family Suicide Attempt	.725		.466	1.298	1.794	.779	1.782		1.572
Friend Suicide Attempt		1.978***	1.546			1.254		1.665	1.168
Background									
Age			.811***			.824			.861*
African American			.535*			.693			.477*
Asian American			1.286			4.808***			.551
Latino \a			.804			.698			.900
Other Race or Ethnicity			.678			<.001***			.683
Parents' Education Level			1.220*			1.173			1.248*
Gay, Lesbian, Bisexual Identity (W3)			2.879**			2.917			3.042**
GPA			.840			.645			.823
High School Dropout (W3)			1.557			2.688*			1.555
Some College (W3)			1.063			1.264			.881
Social Integration									
Religious Attendance			.845			.883			.964
Single-Parent Family			1.200			2.796*			1.184
Step-Parent Family			.995			2.560*			1.049
Other Family Structure			1.447			1.939			1.894
Not Currently Married or Cohabiting (W3)			1.309			1.173			2.751***
Family Integration Scale			.871			1.015			1.083
Friends Care			1.014			1.481			.799
Psychological Factors									
Emotional Distress			1.041**			1.026			1.055***
-2 Log Likelihood	1841.515	1821.903	1709.455	794.630	789.706	709.774	1660.011	1656.320	1547.991
Response Profile (n=1/n=0)	202/3873	202/3873	202/3873	59/4016	59/4016	59/4016	197/3658	197/3658	197/3658
N	4,075	4,075	4,075	4,075	4,075	4,075	3,855	3,855	3,855

Note: All independent variables measured at Wave II unless otherwise noted.

Source: The National Longitudinal Study of Adolescent Health.

* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

respondents are entering early adulthood. These models help us understand the temporality of suicide suggestion, while also allowing us to establish a clear time order between an adolescent's history of suicidal thoughts (Wave I), the experience of a friend's or family member's suicide attempt (Wave II), and subsequent suicidal behaviors (Wave III).

Overall, models presented in Table 3 demonstrate a significantly different pattern from those presented in Table 2. For boys and girls, the impact of a role model's suicide attempt, whether a family member or a friend, appears to fade with time. By Wave III, we find only one significant relationship between a measure of suicide suggestion and suicidal thoughts. Model 2 in Table 3 indicates a significant bivariate relationship between the experience of a friend's suicide attempt at Wave II and girls' reports of suicidal thoughts at Wave III. This finding, however, does not hold in full models, although the odds ratio is in the expected direction ($OR = 1.546$) and the p -value is very close to the threshold for statistical significance ($p > .055$) (Model 3 in Table 3). We further investigated the change in statistical significance between the bivariate and saturated models in analyses not presented here (but available from the authors by request). We found that adolescent girls' emotional distress at Wave II explains the impact of a friend's suicide attempt on girls' likelihood of reporting suicidal thoughts at Wave III, net of other key controls. The significant effect of a friend's suicide attempt on girls' likelihood of suicidal thoughts remains until emotional distress is included in the model. This suggests that emotional distress may serve as an important mechanism through which suicide suggestion operates, particularly for girls.

Our models from Wave III suggest that the increased risk of suicide suggestion found over the short run (in Table 2) fades with time. Six years later, we find little evidence that experiencing a role model's suicide attempt, whether friend or family member, has a long-term effect, except perhaps for girls for whom it is mediated by emotional distress.

DISCUSSION

Within the sociology of suicide, social integration and regulation are often emphasized as the primary social forces that protect or put individuals at risk of suicide. These Durkheimian mechanisms are undoubtedly important (Bearman 1991; Pescosolido 1990; Pescosolido and Georgianna 1989; Wray et al. 2011), but much research on the spread of health behaviors implicates social ties as not just mechanisms for social support, but also potential conduits for the spread of suicidal behaviors via suicide suggestion, illuminating another side to social integration. We find that suicide attempts of role models—primarily friends—are in fact associated with adolescents' development of suicidal thoughts and, in some cases, attempts. Effects of suicide suggestion appear to fade with time, girls are more vulnerable to suicide suggestion than boys, and the type of role model—for teenagers at least—matters. Our findings suggest that social relationships, contra Durkheim, are not always protective against suicide, at least not when significant others exhibit suicidal tendencies. This reinforces the idea that the structure—and content—of social networks conditions their role in preventing suicidality. Specifically, social ties can be conduits of not just social support but also antisocial behaviors, like suicidality.

Our study has four primary implications for advancing the sociological understanding of suicide. Our most essential contribution to the literature on suicide suggestion via personal role models is the evidence we provide indicating that being aware of a role model's suicide attempt is associated with the development of suicidal thoughts and sometimes attempts. This relationship is robust to many measures of risk and protective factors. Experiencing the suicide attempt of a significant other may serve as a vehicle for learning a way to deal with distressing life events—by becoming suicidal (Jamison 1999). Future research should continue to probe the question of how suicide suggestion contributes to the development of suicidality. Many potential mechanisms—social learning, imitation,

and emotional contagion—may underlay the observed association between role models and those exposed to their suicidality. Qualitative research, in particular, may provide valuable insights into which potential mechanisms promote the spread of suicidality via social ties. Understanding how and when suicide suggestion becomes salient to youths' suicidality would greatly help practitioners prevent suicides. Our study provides a first step toward this larger goal.

In addition to providing insights into suicide suggestion as an important mechanism in the adolescent suicide process, our study has implications for understanding the temporality of suicide suggestion via individuals' role models. Previous research on suicide rates and media exposure found effects of suicide suggestion tend to last two to four weeks (Phillips 1974; Stack 1987). Considering the potential differences in connectedness derived from face-to-face relationships and direct contact versus mediated sources, we hypothesized that personal role models would have a stronger, or longer lasting, effect on adolescents exposed to their behavior. In fact, our findings suggest that having a friend attempt suicide has a longer lasting effect than reading about a suicide in the paper or seeing a fictive suicide on television. We find that effects of a friend's or family member's suicide attempt last at least one year, if not more—considerably longer than the effect of exposure via the media documented in prior research. By six years, however, the effect of a friend's or family member's suicide attempt appears to fade in significance. Among adolescent girls, however, a friend's suicide attempt may continue to shape suicidal thoughts even six years later; notably, this effect is explained by girls' emotional distress levels. Future research should examine this pattern in more detail, as this finding suggests an indirect, but potentially important, long-term impact of suicide suggestion via girls' emotional distress.

Perhaps it is not shocking that we do not find strong evidence that effects of role models' suicide attempts last over the long run. Teens who survive the first year (or so) following a friend's suicide attempt may be, or

become, emotionally resilient. By early adulthood, a role model's suicide attempt in adolescence may no longer be central to one's daily life, a life no longer constrained within the bounds of high school. Research on contagion generally focuses on relatively bounded social spaces—like Native American reservations, mental wards, or high schools—and finds these spaces are at higher risk of geographic-temporal suicide clustering (e.g., Gould et al. 1990). Outside of relatively bounded social environments, do effects of role models' suicides spread via social ties? Investigating the role of exposure to suicides inside and out of bounded social contexts would add more depth to our understanding of how suicides—and potentially other behaviors—become socially contagious.

Our third major contribution to the literature comes from our emphasis on the role of gender in the suicide suggestion process. Given that boys and girls experience peer relationships differently (Crosnoe 2000), understanding how a social mechanism, such as suicide suggestion, differs for boys and girls is crucial to arriving at a full understanding of the development of adolescent suicidality. In fact, we find significant gender differences in the role of suicide suggestion: suggestion appears more salient to girls. Among boys, friends are the only relevant personal role models for triggering the development of suicidal thoughts; girls' suicidal behaviors, on the other hand, are influenced by both family and friends. Moreover, among girls, suicidal thoughts *and attempts* are associated with suicide suggestion. Finally, effects of a friend's or family member's suicide attempt may last longer for girls.

Although we found girls were more vulnerable, absent an observed history of suicidal thoughts, boys were not immune to suicide suggestion. Note that Thompson and Light (2011), who analyzed suicide attempts net of prior suicidal thoughts, found that boys and girls responded similarly to a role model's suicide attempt. This suggests the role of gender may change at different points in the suicidal process and that a predisposition toward suicidality may be particularly important for understanding those differences.

Why would girls be more vulnerable than boys to suicide suggestion? A definitive answer to this question is beyond the scope of this article, but we can suggest some theoretical considerations that may help explain this variation and offer paths for future research. Because girls develop and maintain more intense intimate relationships (Crosnoe 2000), they may be more primed to “take the role of the other” and hence may be more vulnerable to suggestive mechanisms, including developing emotional distress that sustains the original suggestive triggers. For boys, having relationships that are far less emotionally anchored may reduce or mitigate the effects of suggestion, which raises vital questions about which mechanisms are more salient in the development of boys’ suicidal thoughts. Future research should continue to examine the complex role gender plays in the adolescent suicide process, as this may help determine different strategies for preventing suicides.

Our fourth and final major contribution to the sociology of suicide stems from our examination of how different role models—friends and family members—vary in terms of their importance in the suicide suggestion process. Our findings indicate that peers may be more meaningful than family to adolescents, for both boys and girls. Social psychology has long shown that behavior is more strongly shaped by members of reference groups central to the formation and maintenance of one’s identity (Stryker 1980). To be sure, a teen’s family consists of similar individuals whom the teen may identify with, but research on adolescents clearly demonstrates that purposive efforts to differentiate oneself from one’s family are accompanied by concomitant identification with peers. This is not to say that a family member’s suicidal tendencies are not distressing in adolescence. For example, we find that for adolescent girls, over the short run, a family member’s suicide attempt increases their likelihood of reporting suicidal thoughts (but not attempts) one year later. Yet taken as a whole, our findings indicate that friends’ suicide attempts are more influential than family members’ suicide

attempts in adolescents’ lives, at least once adolescents’ Wave I suicidality is controlled.

Limitations

Although our findings provide new and important insights into the sociology of suicide, this study is not without its limitations. First, and perhaps most obvious, we are limited to analyzing respondents’ suicidal behaviors because we have no information on Add Health respondents who commit suicide. Individuals who report suicidal thoughts or have a history of nonfatal suicide attempts are significantly more likely to commit suicide, but fatal suicide attempts are most common among individuals with no history of nonfatal suicide attempts. Generalizing these findings to the spread of suicide deaths should thus be done with caution. Furthermore, there is attrition in the Add Health sample between waves, and given the higher completion rate among male suicide attempters, more boys than girls may be missing from our analyses due to a completed suicide. Additionally, respondents who actually commit suicide may have been the most likely to be affected by suicide suggestion. Unfortunately, we could find no information from Add Health on whether suicide, or even death, played a significant role in sample attrition. Fortunately, the rarity of suicide among adolescents reduces the risk of this substantially biasing our findings. However, this discussion highlights the significance of finding a way to compare the “lethality” of all types of role models, from the personal to the media-based. Future data collection efforts should note this key gap in the literature.

Our second limitation is related. We chose to focus on friends’ and family members’ suicide attempts, rather than actual suicides, for practical reasons. Very few respondents reported having a friend or family member complete suicide. This fact may affect our findings on the importance of suicide suggestion. The power of suicide suggestion in the case of a suicide may be greater than the power of suggestion based on a nonfatal suicide attempt. If anything, our findings may thus underrepresent the

potential salience of suicide suggestion as a social mechanism in suicidal behaviors.

Finally, although we did our best to account for adolescents' vulnerability to suicide, we are limited by available data. Specifically, we analyzed a sample of adolescents who reported no suicidal thoughts at Wave I in an attempt to parse out effects of selection into friendships from the influence those friendships may have on an individual. Some adolescents with a history of suicidality, perhaps prior to Wave I, may have been included in our sample. Our study provides one of the best efforts to date to isolate selection from the effect of suicide suggestion, but further investigation of these issues is needed before we can be confident that suggestion affects the development of suicidality.

CONCLUSIONS

Sociologists commonly turn to Durkheimian measures of social integration and regulation when searching for sociological explanations for suicide, but our findings indicate that suicides, like other behaviors, can spread through social relationships via suicide suggestion. Friends' and family members' suicide attempts may trigger the development of suicidal behaviors, suggesting that exposure to role models is a powerful way that drastic and deviant behaviors, like suicide, become normalized. Notably, the relationship to the role model conditions the experience of suicide suggestion. Furthermore, adolescent girls appear more susceptible than boys to adopting the suicidal behaviors they observe through social relationships. This study provides important information for the evolution of the sociology of suicide, but our findings also have vital policy implications for public health officials attempting to prevent adolescent suicide. Namely, policies and practitioners need to be sensitive to the importance of suicide attempts (and not simply suicides), particularly among peers and for girls. Additionally, the increased risk of suicidality associated with friends' suicide attempts may last a year or more, which is longer than previously thought.

For adolescents, ties do bind, but whether these ties integrate adolescents into society,

with positive repercussions for their emotional well-being, or whether they promote feelings of alienation, depends in part on the qualities embedded in those ties. On the surface, these findings may appear to contradict Durkheim's sociology, given his focus on solidarity through collective effervescence. Yet, Durkheim argued that solidarity was a product of a shared, collective conscience that spreads through ritualized, emotion-laden interaction. Why should we expect deviant behavior like suicide to be precluded from the types of norms that can spread across actors? Instead, we posit that for a full understanding of how social integration works in individuals' lives to shape their life chances, we must consider not only the social support social ties provide, but also the emotions, behaviors, and values that inhere in those social relations.

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Notes

1. We are particularly grateful to an anonymous reviewer for suggesting this formulation.
2. The SAS programs used to recode and analyze all data are available from the authors by request.
3. Tables presenting odds ratios and confidence intervals are available from the authors by request.

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