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

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Abstract

Though Durkheim argued that strong social relationships protect individuals from suicide, we posit that these relationships have the potential to increase individuals' vulnerability when they expose them 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 the suicide attempts of role models, specifically friends and family. We find that the suicide attempts of role models do in fact trigger new suicidal thoughts and in some cases attempts, even after significant controls are introduced. Moreover, we find that these effects fade with time, that girls are more vulnerable to them than boys, and that 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. Specifically, social ties can be conduits of not just social support, but also anti-social behaviors, like suicidality.

INTRODUCTION

Understanding suicide has been essential to the sociological enterprise since Durkheim (1897 [1951]) wrote his famous monograph, in which he argued that groups that integrated and (morally) regulated their members offered protective benefits against suicide. Though Durkheimian mechanisms remain highly relevant (cf. Pescosolido and Georgianna 1989; Thorlindsson and Bjarnason 1998; Maimon and Kuhl 2008), 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., Phillips 1974; Gould 2001; Stack 2003, 2009). While Durkheim assumed that social integration protected individuals, suicide suggestion demonstrates that suicidality can spread between 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 of social ties themselves, and how the networks individuals are embedded within produce the protective benefits that Durkheim observed (Pescosolido 1990; Bearman 1991; Wray,

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Colen, and Pescosildo 2011). As such, it is possible to imagine social ties as capable of both social support and social harm (Pescosolido 1990; Haynie 2001; Baller and Richardson 2009). Thus, while Durkheim was right that collective solidarity was often protective, we argue that only by acknowledging the behaviors, values, and emotions embedded in network ties are we able to elaborate our understanding of how social relationships shape individuals' life chances.[1] This subtle shift provides an opportunity to integrate two equally important, but often unnecesarrily 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 observed 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) issued guidelines for how the media should report on suicides so as to limit their spread (SPRC 2013). Less research has examined how suicides spread through personal role models, but what is currently known is that there is a robust association between a friend's (and sometimes family member's) suicidal behavior and that of the person exposed to it (Bjarnason 1994; Thorlindsson and Bjarnason 1998; Bearman and Moody 2004; Liu 2006; Niederkrotenthaler et al. 2012). However, these studies have often failed to address critical questions; specifically, 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. In doing so, we tease out further 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 their 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 David Phillips' (1974) groundbreaking work, suicide suggestion studies have typically examined (1) the association between celebrity suicides and national/local suicide rates (Gould 2001; Stack 2003, 2005), (2) the association between fictionalized media suicides and national/local rates (e.g., Stack 2009), and (3) the apparent geographic and temporal clustering of suicides (e.g., Gould, Wallenstein, and Kleinman 1990; Baller and Richardson 2002). Less extensively, studies have investigated the effect a personal role model's suicidal behavior has on the person(s) exposed to it (e.g., a friend or family member). The logic of these studies is predicated on social psychological assumptions.

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[1]We are particularly grateful to an anonymous reviewer for pushing us towards this formulation.

Significant others or persons labeled as members of a reference groups we identify with are far more likely to influence and shape behavior than non-significant others or 'outsiders' (Stryker 1980). Additionally, direct ties that are infused with socioemotional meanings can act as conduits for the spread of behavioral norms (Goffman 1959), and positive *and* negative affect, which act as motivation for reproducing 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 U.S. involve "suicidal behavior following the dissemintation of a suicidal model in the media." Models may be real celebrities like Marilyn Monroe or may be fictionalized models 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% spike in aggregate rates, whereas Marilyn Monroe's suicide, a high status and highly-publicized suicide, was followed by a 13% spike in the U.S. suicide rate (Phillips 1974; Stack 2003). Though the evidence concerning the 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), a recent meta-analysis found youths 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—e.g., local newspapers should only affect their readership, whereas nationally televised shows should reach more people. Furthermore, research shows that the 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 the personal circumstances of individuals: 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, then 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 the 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. Interestingly, the majority of studies that focus on personal role models have concentrated on adolescent suicide, perhaps because adolescent suicide has tripled since the 1950s and, thus, represents a serious public health problem (NIMH 2003). It may also be that adolescents are particularly vulnerable to suicide suggestion. For example, adolescents are particularly socially conscious—social status and social relationships are a major focus of their daily lives. Moreover, teenagers are greatly influenced by the values and behaviors of their peers (Giordano 2003), which may increase their vulnerability to suicide epidemics. Finally, adolescents are unique in that their sense of self is still in formation and is therefore more malleable than that of adults (Crosnoe 2000; Crosnoe and Johnson 2011). As such, any insights into factors contributing to the development of suicidality are crucial to teen suicide prevention.

Generally, studies of personal role models establish that having a friend and/or family member exhibit suicidal behavior is positively associated with the exposed adolescent's own suicidality (Bjarnason and Thorlindsson 1994; Evans, Hawton and Rodham 2004; Bridge, Goldstein, and Brent 2006), even after controlling for other measures of social integration and regulation and psychological distress (e.g., Bjarnason 1994; Bearman and Moody 2004). 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). Although these studies add to our understanding of sociological influences on suicide, they fail to examine who is most vulnerable to suggestion and how long the effects may linger, and 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 his colleagues (1989) had the rare opportunity to collect data immediately following a suicide at a high school. While they were unable to measure students' predispositions to suicide prior to their peer's suicide, their findings suggest that suicide suggestion can spread rapidly and then gradually lose some of its effect. More recently, Niederkrotenthaler and his colleagues (2012) found that young children exposed to their parent's suicidal behavior were far more likely to develop suicidal behaviors over time than their counterparts. While their work is interesting, it is primarily epidemiological and fails to control for potentially significant confounding factors, such as social integration. Finally, Thompson and Light (2011) examined what factors are associated with adolescent nonfatal suicide attempts and found that the attempts of role models significantly increased adolescents' likelihood of attempting suicide, net of respondents' histories of suicidal thoughts and many other factors. Though these studies provide interesting insights into exposure to the suicidal behaviors of a role model, the questions of who is most vulnerable and how long that vulnerability lasts remains open, and the role suggestion plays as an aspect of social integration remains unacknowledged.

Similarity Between Individuals & 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 as they select friends and peer groups based on how similar potential friends are to themselves (Crosnoe, Frank and Mueller 2008; Joyner and Kao 2000). Research has even shown that adolescent friendships tend to be homophilous in terms of depression levels (Schaefer, Kornienko, and Fox 2011) and aggression (Cairns et al. 1988). Thus, it is possible that the effect of suicide suggestion on an adolescent's suicidal behaviors may in fact be due to unobserved preexisting similarities between friends. To address this limitation, we focus only 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 may contribute 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 the effects of suggestion via personal role models linger as time passes, and for whom. Given past research, there are likely temporal limitations to how long suggestive effects last. Previous studies on the effects of media exposure have generally found that spikes in suicide rates last between two and four weeks (Phillips 1974; Stack 1987). Given that significant others tend to have a greater impact on individuals than non-significant others (Stryker 1980), it is reasonable to expect that the effects of personal role models last longer than suicides publicized in the media. As such, we take advantage of the design of the Add Health survey, to test whether the impact of a role model's suicide attempt is observable after approximately one and six years.

Family versus Friends—Generally, studies of suicide suggestion do not distinguish between the effects of family member versus friend's suicide attempt on those exposed. Given that past research has demonstrated that "the influence of friends surpasses that of parents" by mid-adolescence (Crosnoe 2000:378), and friends' influence has been strongly linked with teen delinquency, health behaviors, and pro-social behaviors (Haynie 2001; Giordano 2003; Frank et al. 2008; Mueller et al. 2011), we may 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 family. As such, we analyze the two types of role models separately.

Gender Differences—The final aspect deserving greater attention focuses on potential gender differences in suggestion and suicidality. Little research has emphasized potential gender differences in how adolescents develop suicidal behaviors despite the fact that key differences exist in the suicidal behaviors between adolescent boys and girls (Baca-Garcia et al. 2008)—e.g., girls are more likely than boys to report non-fatal suicide attempts, while boys are more likely to experience fatal suicides. Another important reason to consider how suicide suggestion affects boys and girls is motivated by differences in boys' and girls' friendships. Girls tend to have fewer, but more intimate, emotionally-laden friendships while boys tend to maintain less emotional and more diffuse networks focused around shared activities (Crosnoe 2000). What's more, girls tend to be more sensitive to other's opinions (Gilligan 1982) and are more easily influenced by peers than boys (Maccoby 2002). These findings suggest that girls may be more susceptible to role models' suicide attempts than boys.

In sum, 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. The 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 pushing us closer to a robust sociological theory of suicide.

METHODS

Data

This study employs data from Wave 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 7–12 in 132 middle and high schools in 80 different communities. From a list of all schools containing an eleventh grade in the U.S., 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 1994–1995; from this sample, a nationally-representative sub-sample 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 of the participants from Wave I. Some groups of respondents were generally not followed up at Wave II; the largest of these were Wave I 12th graders (they had generally graduated high school by Wave II). Wave III was collected in 2001–2002 and followed up the Wave I in-home respondents (including those who were excluded from Wave II) who were then approximately ages 18–23. Additional information about Add Health can be found in Harris et al. (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 that we could properly account for the complex sampling frame of the Add Health data. Second, our strategy involves longitudinal data analysis; as such, we restrict our sample to adolescents who participated in Waves I and II for our analyses of Wave II outcomes and Waves I, II and III of Add Health for our analyses of our Wave III outcomes. 10,828 respondents have valid sample weights and participated in all three Waves of Add Health. Our third selection filter selects only adolescents with no suicidal thoughts or attempts at Wave I, so that the time order of events is preserved such that we can determine whether suicide suggestion plays a role above and beyond pre-existing vulnerabilities to suicidality. This restriction reduces our analytic sample to 9,309. 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 chose as friends and their vulnerability to suicide (following the logic of classic ANCOVA—cf. Shadish, Campbell and Cook 2002). Our final selection filter is to exclude adolescents who are missing on any key independent variables.

Though these restrictions have the potential to bias our sample, 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 the analytic sample is the lower incidence of suicidal thoughts and attempts at Wave 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 in terms of average levels of emotional distress or demographic variables from the entire Wave I sample.

Measures

Dependent Variables—We analyze two dependent variables: *Suicidal Ideation* and *Suicide Attempts* at both 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 as 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 4 (6 or more times). Adolescents' responses were recoded 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 as 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" are coded as 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 the 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 = 0.77) is based on four items that measure how integrated adolescents are in their families (Bjarnason 1994). Adolescents were asked how much they feel that 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 are coded so that a higher value on the scale indicates a higher feeling of family caring. Our measure of adolescents' relationship 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 values on this

measure indicate a higher feeling of caring friends. *Religious Attendance* measures how often adolescents attend religious services. Responses ranged 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 experience some form of same-sex attraction (Pearson, Muller, and Wilkinson 2007). At Wave III, adolescents were asked to choose a description that fits how their sexual identity, from 100% homosexual to 100% 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", and "100% homosexual (gay)" were coded has 1. Heterosexual, asexual, and mostly heterosexual adolescents were coded as 0.

Because emotional distress may increase an adolescents' likelihood of becoming suicidal, we control for *Emotional Distress* in all models. *Emotional Distress* is measured by a nineteen item abridged Center for Epidemiological Studies-Depression (CESD) scale (Cronbach's Alpha=0.87). Add Health, at both Wave I and Wave II, asked subjects how often a series of questions including, "You didn't feel like eating, your appetite was poor;" "You felt that you were just as good as other people;" "You felt depressed." Positive items were reverse coded so that 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. Adolescents' 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 or not the adolescent successfully graduated from high school and if they have attended some college is included in the models predicting suicidal behaviors at Wave III. Because of the age range of the sample, some students have not had time to complete a college degree; however, all have had an opportunity to begin their college coursework and graduate from high school.

Family structure captures whether or not they live in a two-biological parent family, a single parent family, a family that includes step-parents, or other family type at Wave I. *Race/ethnicity* is coded as five dichotomous variables: Latino/a, Black, Asian American and other race or ethnicity, with White as the reference category. *Parents' education* was taken from the parent questionnaire and the maximum value was taken in the case of two parents. If the information was missing from the parent questionnaire, the students' report of their parents' education level was used. Parents' education was coded as (0) for 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 4-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 Wave 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 the Add Health data were collected using a complex survey design (described above), 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. Variance is estimated 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 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 and friends' suicide attempts in adolescent girls' and boys' suicidal behaviors at Wave II, before turning to boys' and girls' behaviors at Wave III.

Suicidal Behaviors at Wave II

Table 2 presents odds ratios from logistic regressions predicting suicide ideation and suicide attempts for both girls and boys. As a first step, we estimate the bivariate relationship between family member's suicide attempts (Wave I) and adolescents' suicidal thoughts and attempts a year later (Wave II) (Table 2; Models 1, 4, and 7). A family member's attempted suicide (Model 1) significantly increases the likelihood that adolescent girls report suicidal

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[2]The SAS programs used to recode and analyze all data are available from the authors by request.

thoughts at Wave II; however, it is not associated with suicide attempts at Wave II (Model 4). On average, girls who report that a family member attempted suicide at Wave I are 2.99 times more likely to report suicidal thoughts at Wave II than girls who did not experience a family members' suicide attempt. This pattern is not found among boys. For boys, we find no significant relationship between 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 our attention 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 friends' suicide attempt has a significant and positive relationship to boy's 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 2.13 times more likely to report suicidal *thoughts* after experiencing a family member's attempted suicide and 1.56 times more likely after experiencing a friends' 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 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, the suicide attempt of a friend renders boys 1.65 times more likely to report suicidal thoughts at Wave II. The suicide attempt of a family-based role model remains insignificant (confirming the associations found in Models 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 as girls appear more sensitive to familial role models than boys. Next we turn our attention to Wave III to investigate the long-term impact of suicide suggestion.

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 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

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[3]Tables presenting odds ratios and confidence intervals are available from the authors by request.

adolescent's history of suicidal thoughts (WI), the experience of a friend or family member's suicide attempt (WII) and subsequent suicidal behaviors (WIII).

Overall, the models presented in Table 3 demonstrate a significantly different pattern from those presented in Table 2. For boys and girls, the impact of the suicide attempt of a role model, whether a family member or friend, appears to fade with time. By Wave III, we find only one significant relationship between a measure of suicide suggestion and suicidal thoughts. Table 3, Model 2, 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 though the odds ratio is in the expected direction (OR=1.25) and the p-value is very close to the threshold for statistical significance (P-value > 0.055) (Table 3, Model 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). Interestingly we found that an adolescent girls' emotional distress at Wave II is what explains the impact of a friends' suicide attempt on a 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' likelihoods 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, there is little evidence that experiencing the suicide attempt of a role model, whether friend or family member, has an effect over the long-run, except perhaps for girls where 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. Though these Durkheimian mechanisms are undoubtedly important (Pescosolido and Georgianna 1989; Pescosolido 1990; Bearman 1991; Wray et al. 2011), myriad research on the spread of health behaviors implicates social ties as not just mechanisms for social support, but also as potential conduits for the spread of suicidal behaviors via suicide suggestion, illuminating another side to social integration. We find that the suicide attempts of role models— primarily friends—are in fact associated with the development of suicidal thoughts and in some cases attempts in adolescence. Though we find that the effects of suicide suggestion appear to fade with time, we also find that 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, as Durkheim argued, 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 anti-social 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 was 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. A myriad of potential mechanisms – social learning, imitation, emotional contagion – all may underly the observed association between role models and those exposed to their suicidality. Qualitative research, in particular, may provide valuable insights into which of these potential mechanisms promotes the spread of suicidality via social ties. Understanding how and when suicide suggestion becomes salient to youth's suicidality would greatly help practitioners prevent suicides. Our study provides a first step towards 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 our understanding of the temporality of suicide suggestion via individual role models. Previous research on suicide rates and media exposure found the effects of suicide suggestion tended 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 vis-à-vis mediated sources, we hypothesized that personal role models would have a 'stronger' or longer lasting effect on those 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. Our study finds that the impact of the suicide attempt of a friend or family member lasts 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 or family member's suicide attempt appears to fade in significance. Our one finding contrary to this pattern is that among girls the suicide attempt of a friend in adolescence may continue to shape their 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.

That we do not find strong evidence that the suicide attempt of role models lasts over the long run is perhaps not shocking. Teens that 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 essential to their daily lives, lives no longer constrained within the bounds of the high school. Research on contagion has generally focused on relatively bounded social spaces, like Native American reservations, mental wards, and high schools, finding that relatively bounded social spaces are at higher risk of geographic-temporal suicide clustering (e.g., Gould et al. 1990). Outside of relatively bounded social environments—like schools—is the suicide of a personal role model able to 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. And in fact, we find significant gender differences in the role of suicide suggestion: suggestion appears more salient to girls. Among boys, the only relevant personal role models for triggering the development of suicidal thoughts are their friends; girls' suicidal behaviors, on the other hand, are influenced by role models from both their families and friends. Second, among girls, both suicidal thoughts *and attempts* are associated with suicide suggestion. Finally, the effects of a friend or family member's suicide attempt may last longer for girls.

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

Why would girls be more vulnerable than boys to suicide suggestion? Though a robust answer to this question is beyond the scope of this paper, we can suggest some theoretical considerations that may help explain this variation as well as 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 what mechanisms are more salient in the development of suicidal thoughts for boys. Future research should continue to examine the complex role gender plays in the adolescent suicide process, as it 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 peer role models may be more meaningful to adolescent lives than family role models, for both boys and girls. Social psychology has long shown that individual's behavior is more strongly shaped by members of reference groups central to the formation and maintenance of their identity (Stryker 1980). To be sure, a teen's family consists of similar individuals who 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 the suicidal tendencies of a family member are not distressing in adolescence. For example, we find that for adolescent girls, over the

short run, the suicide attempt of a family member increases their likelihood of reporting suicidal thoughts (but not attempts) one year later. Yet taken as a whole, our findings indicate that the suicide attempts of friends are more influential in adolescents' lives than the suicide attempts of family members, 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 obviously, we are limited to analyzing respondents' suicidal behaviors as we have no information on Add Health respondents who commit suicide. Though individuals who report suicidal thoughts or have a history of non-fatal suicide attempts are significantly more likely to commit suicide, fatal suicide attempts are most common among individuals with no history of non-fatal suicide attempts; thus, generalizing these findings to the spread of suicide deaths should be done with caution. Further, there is attrition in the Add Health sample between waves, and given the higher completion rates among male suicide attempters, it may be that more boys than girls are missing from our analyses as a result of a completed suicide. Additionally, we could hypothesize that 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 biasing our findings substantially. 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 their 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 suicide suggestion based on a nonfatal suicide attempt. This suggests that, if anything, our findings may underrepresent the potential salience of suicide suggestion as a social mechanism in suicidal behaviors.

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

CONCLUSION

Though sociologists commonly turn to Durkheimian measures of social integration and regulation when searching for sociological explanations for suicide, our findings indicate

that suicides, like other behaviors, can spread through social relationships via suicide suggestion. The suicide attempts of friends and family members may trigger the development of suicidal behaviors, suggesting that exposure to role models is a powerful way that even drastic and deviant behaviors, like suicide, become normalized. Notably, the relationship to the role model conditions the experience of suicide suggestion. Further, adolescent girls appear to be more susceptible than boys to adopting the suicidal behaviors they observe through social relationships. While this study provides important information for the evolution of the sociology of suicide, 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 particularly for girls. Additionally, the increased risk of suicidality associated with the suicide attempts of friends 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 that tie. On the surface, these findings may appear to contradict Durkheim's sociology, given his focus on solidarity through collective effervescence. Yet, Durkheim argued solidarity was a product of a shared, collective conscience that spreads through ritualized, emotion-laden interaction; why should we expect, then, 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.

Acknowledgments

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Biographies

Seth Abrutyn is Assistant Professor of Sociology at the University of Memphis. As a general Sociological theorist, he has long been interested in macrosociology and institutions, which has culminated in a book due out this fall: *Revisiting Institutionalism in Sociology*. Recently, his research interests have moved toward the sociology of suicide that includes examining the processes by which suicides can spread as well as how these processes relate to and expand Durkheim's classic thesis.

Anna S. Mueller is Assistant Professor of Sociology at The University of Memphis. Her research examines how peers shape adolescent health and wellbeing over the transition to adulthood, with a focus on weight-control behaviors, body weight, and suicide. Her research emphasizes why and how behaviors and values spread between individuals generally using insights from social psychology. Additionally, she has a forthcoming study, with Kenneth A. Frank and Chandra Muller (*American Journal of Sociology*), that investigates how schools shape adolescent friendship formation in ways that have implications for adolescent status hierarchies.

Table 1

Weighted Descriptive Statistics for Key Variables

	Full Wave 1 Samples				Wave 2 Analytic Samples				Wave 3 Analytic Samples			
	Boys		Girls		Boys		Girls		Boys		Girls	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Suicide Ideation, W1	0.10		0.17		0.00		0.00		0.00		0.00	
Suicide Attempt, W1	0.02		0.06		0.00		0.00		0.00		0.00	
Suicide Ideation, W2	0.08		0.15		0.05		0.09		0.05		0.09	
Suicide Attempt, W2	0.02		0.05		0.01		0.03		0.01		0.03	
Suicide Ideation, W3	0.07		0.07		0.06		0.06		0.06		0.06	
Suicide Attempt, W3	0.01		0.03		0.01		0.02		0.01		0.02	
Age, W1	15.18	1.61	15.37	1.71	15.29	1.62	15.12	1.58	15.13	1.53	15.01	1.53
White	0.67		0.68		0.67		0.68		0.67		0.67	
African American	0.14		0.15		0.14		0.16		0.15		0.16	
Asian American	0.04		0.04		0.04		0.04		0.04		0.04	
Hispanic	0.12		0.11		0.11		0.10		0.12		0.11	
Other Race/Ethnicity	0.03		0.03		0.03		0.02		0.03		0.02	
Parents' Education	2.87	1.28	2.85	1.26	2.88	1.24	2.87	1.24	2.93	1.24	2.91	1.25
Lives with Two Biological Parents	0.58		0.57		0.59		0.59		0.59		0.60	
Same-sex attraction, W1	0.08		0.05		0.06		0.04		0.07		0.04	
GPA, W1	2.73	0.80	2.92	0.76	2.75	0.77	2.97	0.75	2.78	0.75	3.00	0.74
Emotional Distress, W1	28.93	6.87	30.81	8.14	28.11	5.91	29.42	6.99	27.91	5.83	29.11	6.80
N	5042		5694		4301		4523		3855		4075	

Source: The National Longitudinal Study of Adolescent Health

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	
	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig
Suicide Suggestion																		
Family Suicide Attempt	2.99	***	---		2.13	**	1.07		---		0.54		1.26		---		0.95	
Friend Suicide Attempt	---		2.05	***	1.56	**	---		3.21	***	2.58	***	---		1.94	**	1.65	*
Background																		
Age	---		---		0.73	***	---		---		0.68	***	---		---		0.98	
African American	---		---		0.63	*	---		---		1.04		---		---		0.81	
Asian American	---		---		0.97		---		---		1.58		---		---		0.74	
Latino)a	---		---		0.81		---		---		1.08		---		---		0.86	
Other Race or Ethnicity	---		---		0.69		---		---		1.33		---		---		1.02	
Parents' Education Level	---		---		0.97		---		---		0.87		---		---		1.06	
Same-Sex Attraction	---		---		1.66		---		---		1.28		---		---		1.50	
GPA	---		---		0.87		---		---		0.97		---		---		0.80	
Social Integration																		
Religious Attendance	---		---		1.00		---		---		0.90		---		---		0.97	
Single Parent Family	---		---		1.50	*	---		---		1.15		---		---		0.94	
Step-Parent Family	---		---		1.30		---		---		1.87		---		---		0.87	
Other Family Structure	---		---		1.05		---		---		1.58		---		---		1.82	
Family Integration Scale	---		---		0.88		---		---		0.68		---		---		0.77	
Friends Care	---		---		1.20		---		---		1.22		---		---		1.40	**
Psychological Factors																		
Emotional Distress	---		---		1.07	***	---		---		1.07	***	---		---		1.04	**
−2 Log Likelihood	2708.71		2698.14		2499.11		1073.98		1039.89		947.58		1729.37		1717.75		1672.63	

	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	
	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig
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	4523		4523		4523		4523		4523		4523		4301		4301		4301	

*
p < .05,

**
p < .01,

***
p < .001 (two-tailed tests)

All independent variables measured at Wave I.

Source: The National Longitudinal Study of Adolescent Health

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	
	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig
Suicide Suggestion																		
Family Suicide Attempt	0.73		---		0.47		1.30		---		0.78		1.78		---		1.57	*
Friend Suicide Attempt	---		1.98	***	1.55		---		1.79		1.25		---		1.67		1.17	*
Background																		
Age	---		---		0.81	***	---		---		0.82		---		---		0.86	*
African American	---		---		0.54	*	---		---		0.69		---		---		0.48	*
Asian American	---		---		1.29		---		---		4.81	***	---		---		0.55	
Latino)a	---		---		0.80		---		---		0.70		---		---		0.90	
Other Race or Ethnicity	---		---		0.68		---		---		<0.001	***	---		---		0.68	
Parents' Education Level	---		---		1.22	*	---		---		1.17		---		---		1.25	*
Gay, Lesbian, Bisexual Identity (W3)	---		---		2.88	**	---		---		2.92		---		---		3.04	**
GPA	---		---		0.84		---		---		0.65		---		---		0.82	
High School Dropout (W3)	---		---		1.56		---		---		2.69	*	---		---		1.56	
Some College (W3)	---		---		1.06		---		---		1.26		---		---		0.88	
Social Integration																		
Religious Attendance	---		---		0.85		---		---		0.88		---		---		0.96	
Single Parent Family	---		---		1.20		---		---		2.80	*	---		---		1.18	
Step-Parent Family	---		---		1.00		---		---		2.56	*	---		---		1.05	
Other Family Structure	---		---		1.45		---		---		1.94		---		---		1.89	
Not Currently Married or Cohabiting (W3)	---		---		1.31		---		---		1.17		---		---		2.75	***
Family Integration Scale	---		---		0.87		---		---		1.02		---		---		1.08	
Friends Care	---		---		1.01		---		---		1.48		---		---		0.80	
Psychological Factors																		

	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	
	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig	Odds Ratio	Sig
Emotional Distress	---		---		1.04	**	---		---		1.03		---		---		1.06	***
−2 Log Likelihood	1841.52		1821.90		1709.46		794.63		789.71		709.77		1660.01		1656.32		1547.99	
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	4075		4075		4075		4075		4075		4075		3855		3855		3855	

*
$p < .05$,

**
$p < .01$,

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

All independent variables measured at Wave II unless otherwise noted.

Source: The National Longitudinal Study of Adolescent Health