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Can Social Ties Be Harmful? Examining the Spread of Suicide in Early Adulthood

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Abstract

Durkheim posited that social relationships protect individuals against suicide; however, substantial research demonstrates that suicide can spread through the very ties Durkheim theorized as protective. With this study, we use Waves I, III, and IV of the National Longitudinal Study of Adolescent Health to investigate whether young adults' suicide attempts and ideations are in part products of exposure to suicidal behaviors via their social relationships. We find that young adults who have had family members or friends attempt suicide are more likely to report suicide ideation or even suicide attempts over both the short and long run. This finding is robust to many important controls for risk and protective factors for suicide. Our findings have implications for the sociology of suicide, not the least of which is that social ties have the power to harm in addition to the power to protect.

Keywords

suicide contagion, suicide suggestion, suicide ideation, suicide attempts, mental health, young adulthood, role models, Add Health

The sociological study of suicide is often synonymous with Durkheim's ([1897] 1951) classic study, where he argued that social ties can protect individuals against the impulse to self-harm by integrating them into the society and providing them with moral regulation. Yet, we also know, particularly from research in social psychology and medical sociology, that social ties have the power to harm individuals' health and well-being (Christakis and Fowler 2008; Thomeer, Umberson, and Pudrovska 2013; Umberson et al. 2006; Williams 2003). When significant others expose individuals to unhealthy behaviors, stress, or negative emotions, those relationships can negatively affect people's health and well-being (Umberson, Crosnoe, and Reczek 2010). In fact, research has found that exposure to the suicide attempt or the suicide death of a significant other can lead to an increased risk of suicidality and distress in the exposed individual (Abrutyn and Mueller 2014a; Baller and Richardson 2009; Bjarnason 1994). This pattern, sometimes referred to as *suicide suggestion* or *suicide contagion*, indicates that the role social ties play in promoting or protecting individuals against suicide is broader than Durkheim's theory allows and that both the positive and negative sides of social ties are worthy of examination.

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Suicide contagion research, with its roots in Gabriel Tarde's (1903) imitation thesis, argues that the natural barriers against self-harm can be worn down and suicide can become a more viable option for coping with emotional distress when individuals experience the suicide attempt or death of someone they deem significant. This research has largely focused on adolescents and has found a consistent association between an adolescent's probability of having serious suicidal thoughts or suicide attempts and an adolescent's exposure to a friend or family member's suicide attempt or death (Abrutyn and Mueller 2014a; Bearman and Moody 2004; Bjarnason and Thorlindsson 1994; Farberow et al. 1987). While this, perhaps, challenges the "conventional" Durkheimian model of suicide, it is not surprising that social ties affect individuals in this way (Abrutyn and Mueller 2014b; Abrutyn and Mueller Forthcoming). Therefore, the task for sociology is to fully elucidate how suicide contagion works to push toward a more nuanced sociological understanding of suicidality.

One major limitation of prior work on suicide contagion is its focus on adolescents and individuals in bounded social contexts. While it makes sense that adolescents—who are in a more vulnerable life-course stage for suicidality—and individuals in ecologically bounded spaces—such as high schools—may be more prone to experiencing suicide contagion, social relationships play a vital role in the communication of both negative and positive emotions and behaviors across the life course and both inside and out of bounded social spaces (Smith and Christakis 2008; Umberson and Montez 2010). Thus, understanding whether contagion is a salient part of the suicide process in other stages of the life course and outside of bounded spaces is essential to our sociological understanding of suicide. This study contributes to answering these questions by employing the National Longitudinal Study of Adolescent Health (Add Health) to analyze suicide contagion via personal role models—such as friends and family members—in early adulthood (when respondents are ages 24–32). Though temporally close in terms of years, key differences exist between young adults and adolescents. Young adulthood reflects a life-course stage when self-concept is increasingly more stable and individuals are less prone to conforming to peer influences (Arnett 2003; Demo 1992; Simmons, Rosenberg, and Rosenberg 1973). In addition, individuals' lives are generally not focused on one social environment, as is the case with adolescents and schools.

In addition to assessing suicide contagion in young adulthood, we take advantage of the design of the Add Health data to determine whether suicide contagion exists above and beyond respondent's suicidality prior to exposure to a role model's suicide attempt and other important risk and protective factors for suicide. In addition, we use three waves of data to examine whether the suicide attempts of role models are associated with respondent's suicidality over both the short and the long run. By addressing these gaps in the current literature, this study deepens our understanding of suicide contagion, enabling the development of a more robust sociology of suicide.

The Spread of Suicide

Famously, Durkheim and his principal rival Gabriel Tarde "debated" whether or not contagion and, perhaps, imitation were sociological processes (Abrutyn and Mueller 2014b). Durkheim's adherence to a theoretical framework that saw social relationships as protective against social pathologies became accepted wisdom and the central theoretical explanation for suicide within sociology (Wray, Colon, and Pescosolido 2011). Today, an orthodox view of Durkheim has become untenable as four decades of mounting evidence indicate that suicides can spread between individuals. Moreover, the idea of social contagion has grown more accepted in various scientific disciplines, as well as pop culture (Gladwell 2000), and researchers have documented the social contagion of various things such as obesity, smoking, and hysterias (cf. Bartholomew and Goode 2000; Christakis and Fowler 2007, 2008, 2009). In addition, social psychologists have found abundant evidence of the spread of emotions (Collins 2004; Hatfield, Cacioppo, and

Rapson 1994), particularly negative ones (Howes, Hokanson, and Loewenstein 1985; Larson and Almeida 1999; Summers-Effler 2004). Emotions are crucial mechanisms of social solidarity (Durkheim [1915] [1995]) that motivate individuals to engage in social learning (Stryker 1980) and accept the normative behaviors and attitudes of primary social groups (Turner 2007). In essence, our emotional reactions to the individuals that comprise our social networks are, in part, why these networks matter to our health and well-being (Christakis and Fowler 2009; Lin 2002).

Social Contagion and Suicide

Though outside of the mainstream Durkheimian tradition, anecdotal evidence of the social contagion of suicide has long been reported. For instance, when Goethe published *The Sorrows of Young Werther* in the late eighteenth century, several copycat suicides—that is, suicides in which young men dressed like Werther and shot themselves as he did in the novel—were first reported among Goethe's own circle of friends, then in Goethe's home town, and finally across several states within Prussia (Gray 1967). In 1974, David Phillips found a positive association between the publicization of a celebrity's suicide on the front page of a newspaper and suicide rates for local and national audiences. Several studies retested and then extended Phillips' work, finding that (1) political and entertainment celebrities were the most likely to trigger temporary spikes in the suicide rate (Stack 1987), (2) the number of days that the suicide made front page news was positively associated with the duration and intensity of the increase in the suicide rate (Stack 2005; Wasserman 1984), and (3) the "visibility" of the celebrity mattered. For example, Marilyn Monroe's suicide was followed by a 13 percent and 10 percent increase, respectively, in American and British suicide rates (Phillips 1974). More recently, the suicide death of a high-profile South Korean actress was followed by a 66 percent spike in the suicide rate in South Korea (Fu and Chan 2013). Increasingly stringent and conservative statistical tests have continued to support Phillips' initial finding that media publicity can lead to spikes in suicide rates (cf. Gould et al. 2014; Romer, Jamieson, and Jamieson 2006; Stack 2005); less consistent evidence exists, but research has also found an association between televised fictional suicides and increases in audience suicide rates (Schmidtke and Hafner 1988; Stack 2009).

Research on *point* clusters—temporally and geographically bounded clusters—provide even greater evidence of how influential role models are in spreading suicidal thoughts and behaviors. Durkheim was aware that penitentiaries, regiments, and monasteries were sites of "epidemic-like" suicide outbreaks, but only recently have there been serious systematic analyses (cf. Haw et al. 2012; Niedzwiedz et al. 2014). When individuals share a collective identity with the decedent, as found in primary groups (e.g., families) and/or physically bounded social contexts (e.g., prisons), the potential for one suicide death to trigger a series of deaths or attempts appears to be heightened. In particular, prisons (Cox and Skegg 1993), psychiatric wards (Taiminen, Salmenpera, and Lehtinen 1992), Native American reservations (Walls, Chapple, and Johnson 2007), and high schools (Davidson 1989; Gould, Wallenstein, and Davidson 1989) appear to be most vulnerable to outbreaks of suicidal thoughts, suicide attempts, and even completions following a community member's suicide death (cf. Gould 2001; Romer et al. 2006). That certain types of networks can facilitate the rapid diffusion of self-harm behaviors is not entirely surprising, particularly if exposure to information about the death is prominent in the community (Gould et al. 2014). However, questions remain about the mechanisms underlying the rapid diffusion of suicidality in communities and their potential link to specific community characteristics.

In an attempt to understand more about these mechanisms, researchers turned to investigating the experiences of individuals with direct exposure to another person's suicide attempt or death. Indeed, not long after Phillips' study, researchers began reporting that adolescents exposed to a friend or family member's attempted or completed suicide were much more likely to report suicidal thoughts (Bjarnason 1994; Bjarnason and Thorlindsson 1994; Farberow et al. 1987; Liu

2006; Tishler 1981) and sometimes attempts (Bearman and Moody 2004). More recently, studies have shown that teenagers who had had no previous suicidal history and who were subsequently exposed to a personal role model's attempted suicide were more likely to develop suicidal thoughts within the next 12 months (Abrutyn and Mueller 2014a). Girls, when exposed to a friend's attempt, were also at risk of attempting suicide within that same time frame. Though this study—and several others (Abrutyn and Mueller 2014a; Baller and Richardson 2009; Pescosolido 2006)—emphasize that social relationships may not always protect against suicidality as Durkheim assumed, several questions remain before we can understand this side of social relationships.

We have identified several important limitations to existing research that we address with this study. First, as we have mentioned, the personal role model research has focused primarily on adolescents. This is at least in part due to practical data limitations—most datasets that contain information on suicide attempts of personal role models employ adolescent samples (for an exception, see Hedström, Liu, and Nordvik 2008). It is also likely due to the elevated salience of suicide as a social problem among teenagers. However, teens may be uniquely vulnerable to suicide contagion because (1) their senses of self are still developing, rendering them vulnerable to peer influences (Giordano 2003); (2) they are less future oriented than adults and, often, are more concerned with rewards reaped from adolescent society rather than adult society (Crosnoe 2011; Steinberg et al. 2009); and (3) unlike older cohorts, they spend an inordinate amount of their waking lives in a bounded social environment—the high school (Coleman 1961). This latter point is important to note, because suicide point clusters—or the appearance of three or more geographically and temporally bound suicides—tend to happen in these types of environments (Niedzwiedz et al. 2014). Not surprisingly, then, some studies have found teens are two to four times more likely to experience a suicide cluster than other age cohorts (Gould et al. 1990). While limited research has examined the impact of a parent's suicide death on young children and finds that children experience an increased risk of suicide after losing their parent to suicide (Niederkrotenthaler et al. 2012), the shared genetic and environmental characteristics of parents and children and the developmental vulnerability of early childhood make this a less-than-ideal test of suicide contagion outside of adolescence and still leaves us wondering - what about other age cohorts? Is suicide contagion only a factor for adolescents?

Young adults—which generally refers to individuals ages 26–35 (Arnett 2000)—make for a compelling age cohort to expand personal role model studies to. First, young adults on average have a more well-established identity than adolescents, and their lives are often characterized by higher levels of self-efficacy and by more stable roles than adolescents (Arnett 2003; Demo 1992; McCarthy and Hoge 1982). Thus, the vulnerability that adolescents experience to peer pressure and imitation is likely less prevalent among young adults. At the same time, young adults' increasing independence and sense of self may allow them to form more intimate, stable social relationships (Simmons et al. 1973). This intimacy may provide important protection from self-harm through social integration and moral regulation, but it may also increase the salience of any suicidality that is experienced through a social relationship. Perhaps the most interesting reason to focus on young adults though is that, unlike adolescents, they are no longer focused on one primary bounded social institution. Young adults spend their lives in several spheres of social life with much wider networks than adolescents. Even young adults who are still in college are likely to have substantial networks outside of their institutions of higher education, whether through family, work, religious organizations, or other secondary associations. Hence, the support network should be wider for young adults, and there is less of an opportunity for the effect of the suicidal role model to be amplified through a bounded social context where many peers or similar others are experiencing the same thing. As such, a focus on young adults allows us to leverage existing data sources to examine whether contagion is dependent on vulnerable life-course stages or on bounded social contexts.

Our study permits us to address one final limitation to existing research. Though there are some notable exceptions (e.g., Abrutyn and Mueller 2014a; Baller and Richardson 2009), the vast majority of studies of contagion use cross-sectional data and, thus, are unable to examine (1) whether pre-existing risk factors for suicide explain the association between respondents and role model's suicidality and (2) how long the harmful effects of exposure to a significant other's suicidality may last. With regard to pre-existing risk factors, the issue research on suicide contagion must contend with is that respondents are likely to be similar to their role models in terms of both risk and protective factors for suicidality. For example, certain risk factors for suicide (e.g., depression) are also known to shape who individuals befriend (Schaefer, Kornienko, and Fox 2011). Family members, by virtue of both nature and nurture, are also likely to be similar to each other. Thus, the task for suicide contagion research is to isolate the possible effect of a role model's suicide attempt from these potential pre-existing similarities between respondents and role models. To address this limitation, we include a substantial group of sociological and psychological controls for known risk and protective factors for suicide in our models so as to better isolate the role that contagion plays in suicidality, to the extent possible with survey data.

The second limitation to using cross-section data is that it precludes an examination of the temporality of contagion. Though not systematically studied, spikes in suicide rates following media coverage of a suicide death seem to last two to four weeks, but can sometimes last longer (Phillips 1974; Stack 1987). Given the social psychological literature on significant others (Lawler 2006; Stryker 1980), we hypothesize that the effects of a personal role model's suicide attempt will last longer than the two to four weeks that are documented in studies of media coverage and suicide rates. Indeed, one study that examined how long the effect lasts for adolescents found that the significant association between the suicide attempt of a friend or family member and a respondent's suicidality lasted at least 12 months and among girls was observable even five years after the exposure (Abrutyn and Mueller 2014a). With this study, we examine both the immediate and long-term effects a role model's suicide attempt has on young adults ages 24–32.

In sum, with this study, we investigate how suicidality spreads between personal role models in young adulthood to further illuminate understandings of this social mechanism for suicide. We focus on two major gaps in existing literature: (1) We determine whether suicide contagion is salient to young adults' suicidality and (2) we use longitudinal data to examine how long the effect of contagion lasts while controlling for important potentially confounding factors related to suicide. By answering these questions, our study contributes to developing a more robust sociology of suicide.

Method

Data

This study employs data from Waves I, III, and IV of the National Longitudinal Study of Adolescent Health (Add Health) (Harris 2009). Add Health contains a nationally representative sample of adolescents in grades 7–12 in 132 middle and high schools in 80 different communities across the United States. Add Health is a longitudinal survey that began with an adolescent sample that was followed into young adulthood. The purpose of the study is to understand how social environments—from families to schools to peers—shape adolescent health, behavior, well-being, and educational attainment. Add Health uses a complex sampling frame to achieve a nationally representative sample. First, 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. In addition, a feeder school (that contained a seventh grade and sent

graduates to the Add Health high school) was chosen for each Add Health high school. From the participating schools, Add Health then conducted the preliminary In-School Survey, which collected data from all students in all Add Health schools (n = 90,118 students) in 1994–1995. From that sample, a nationally representative sub-sample was interviewed at Wave I (n = 20,745) shortly after the In-School Survey (in 1994–1995). Wave II followed in 1996, and Wave III was collected in 2001–2002 when respondents were aged 18–26. Most recently, and germane to our analysis, Wave IV occurred in 2008 and 2009 when respondents were ages 24–32. Approximately 80 percent of the original Wave I sample was re-interviewed at Wave IV, and 14,800 youth participated in Waves I, III, and IV. While each wave of data collection included many of the same items as previous waves of Add Health, additional sections pertinent to young adults such as family formation and work experiences were also added to Wave IV. Additional information about Add Health can be found in Harris et al. (2009).

Sample Selection

We use several sample selection filters to produce analytic samples that allow us to assess suicide contagion in young adulthood. First, we select respondents with valid sample weights (N = 14,800)[1] so that we can properly account for the complex sampling frame of the Add Health data; 901 individuals have missing sample weights because they were missing Wave I sample weights (usually because they were part of an oversampled population and not eligible for Add Health's grand sample). We include Wave I data in our analyses so that we have a measure of respondent's suicidality prior to exposure to the suicide attempt of a role model. This also allows us to account for potential unmeasured factors by including a lagged version of our dependent variables in all models (Shadish, Campbell, and Cook 2002). Finally, we exclude respondents who are missing on any key independent variable. Our final analytic sample size is 10,852. Because these filters have the potential to bias our findings, we explored alternate ways of handling missing data. Specifically, in alternate analyses available from the authors by request, missing values on all independent variables (except the key independent variables, Role Model Suicide Attempt at Wave III and Wave IV) were imputed through multiple imputation using chained equations in Stata/SE 13.1 (Royston 2009). Because handling missing data with multiple imputation did not result in findings that were substantively different from our findings using list-wise deletion, we have opted to handle missing data via list-wise deletion. Table 1 presents weighted descriptive statistics for our analytic samples.

Measures

Dependent variables. With this study, we examine two aspects of suicidality at Wave IV: suicide ideation and suicide attempts. *Suicidal Ideation* is based on respondents' answers to the question, "During the past 12 months, did you ever seriously think about committing suicide?" Young adults who answered "yes" were coded as 1 on a dichotomous outcome indicating suicidal ideation. Respondents 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 (zero times) to 4 (six or more times). Respondents' answers 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. Individuals who reported no suicidal thoughts were coded as 0 on *Suicide Attempts*. These two survey items were asked at Wave I as well; thus, all models include respondents' *Suicide Ideation* (without an attempt) and *Suicide Attempts* at Wave I as an important controls for unmeasured confounds (Shadish et al. 2002).

Independent variables. Our first key independent variable is *Role Model Suicide Attempt at Wave IV.* At Wave IV, respondents were asked only one question regarding suicide attempts by role

Table 1. Weighted Descriptive Statistics.

Variables	*M* or proportion	*SD*
Dependent variables		
Suicide ideation (Wave IV)	0.067	
Suicide attempt (Wave IV)	0.008	
Independent variables		
Role model suicide attempt (Wave III)	0.095	
Role model suicide attempt (Wave IV)	0.064	
Suicide attempt (Wave I)	0.038	
Suicide ideation (no attempts; Wave I)	0.096	
Childhood emotional abuse (Y/N)	0.465	
Childhood physical abuse (Y/N)	0.168	
Childhood sexual abuse (Y/N)	0.046	
Diagnosed depression (Y/N)	0.195	
Alcohol abuse/dependence (Y/N)	0.260	
Sleep problems (Y/N)	0.115	
Married	0.416	
Cohabiting	0.122	
Divorced	0.097	
Single (Ref)	0.365	
Has children (Y/N)	0.463	
Very happy with current romantic partner	0.578	
Not happy with current romantic partner	0.048	
Closeness to romantic partner	4.456	2.607
Closeness to parents	4.525	0.924
Intact family of origin (Wave I)	0.578	
Religious attendance	1.544	1.539
Female (Wave I)	0.516	
Age (Wave I)	15.882	1.748
African American (Wave I)	0.147	
Asian or Asian American (Wave I)	0.037	
Latina/o (Wave I)	0.113	
Other race or ethnicity (Wave I)	0.030	
White (reference group)	0.673	
Parents' education level (Wave I)	4.451	1.683
Socioeconomic status	5.037	1.685
Gay, lesbian or bisexual identity	0.034	
Unemployed (Y/N)	0.069	
Served in the military (Y/N)	0.058	
Educational attainment		
No degree	0.075	
High school degree	0.163	
Some college	0.428	
Bachelor's degree (or higher; Ref)	0.333	
N	10,852	

Source. The National Longitudinal Study of Adolescent Health.
Note. All variables measured at Wave IV unless otherwise noted.

models: "During the past 12 months, have any of your family or friends tried to kill themselves?" Responses were coded as "1" for yes and "0" for no on a variable representing exposure to role

models suicidality (*Role Model Suicide Attempt Wave IV)*. Our second key independent variable is *Role Model Suicide Attempt Wave III* and is based on respondents' answers to two questions: "Have any of your friends tried to kill themselves during the past 12 months?" and "Have any of your family tried to kill themselves during the past 12 months?" Young adults who responded "yes" to either question are coded as 1 on a dichotomous variable. We collapsed these two questions into one measure of role model suicide attempt to be parsimonious with how the question was asked at Wave IV and to provide us with enough statistical power to analyze suicide attempts as a dependent variable.

Control variables. Our models also control for risk and protective factors for suicide identified by prior research. First, we control psychological risk factors from adolescence and young adulthood. In addition to respondent's suicidality at Wave I, we include whether respondents experienced emotional, physical, or sexual abuse while growing up. These forms of abuse are known to increase respondents' vulnerability to suicidality (Joiner 2005). To measure abuse, we used survey items from Wave IV. Respondents were asked how often before their 18th birthday a parent or other adult caregiver (1) said things that made the respondent feel hurt or feel that they were not wanted or loved; (2) hit them with a fist, kicked them, or threw them down on the floor, into a wall, or down stairs; and (3) touched them in a sexual way, forced them to touch him or her in a sexual way, or forced them to have sexual relations. Because the modal value was "never" on all three survey items, we created three separate dichotomous indicators of each type of abuse. A "1" indicates respondents who experienced emotional, physical, or sexual abuse and "0" represents respondents who did not. In addition to the reports of childhood abuse, we control for psychological risk factors for suicide in young adulthood. First, all models also control for whether the respondent reports being diagnosed with depression by a doctor (Y/N). Second, because recent research suggests that sleep disturbances increase the risk of suicidality (Wojnar et al. 2009; Wong and Brower 2012), we include an indicator of whether the respondent is currently experiencing sleep problems, such as an inability to fall asleep, stay asleep, or significant breathing difficulties while sleeping. Finally, there is a well-documented association between alcohol abuse and suicidality (Hufford 2001; Spirito and Esposito-Smythers 2006); therefore, we created a dichotomous variable that identifies respondents who meet the *DSM-4* criteria for alcohol abuse or dependence (based on Add Health's constructed variable C4VAR023) and report current alcohol use.

Because social integration can protect individuals from suicide (Gibbs 2000), we include a series of measures capturing how socially integrated respondents are. Our first measure of social integration is whether respondents have children. This variable is a dichotomous indicator (1 = *has children*, 0 = *does not have children*) and is taken from the household roster data. Relationship status is constructed using Add Health's relationship history data. From this data, we identify respondent's current relationship and create four mutually exclusive statuses: married (0/1), divorced (0/1), cohabiting (0/1), and single (which includes widowed individuals and individuals who are dating) as the reference group. Divorced individuals are identified if they are currently single or dating and they report a past relationship that was a marriage. If individuals are remarried or cohabiting after they are divorced, they are coded as "0" on divorced. Respondents also report how happy they are with their current romantic partner and how close they feel to that partner. There are three possible response categories for happiness with the current romantic partner: very happy, somewhat happy, and not happy. We created two dichotomous indicators—one for very happy (yes/no) and one for not happy (yes/no)—and use "somewhat happy" as the reference group. Respondents are also asked on a scale of 1–7 how close they felt to their partner, with higher values indicating a closer relationship. Individuals who are not in romantic relationships receive a 0 on both of these measures.

Families of origin can also be important sources of social integration; thus, we control two aspects of respondent's relationships with their parents. First, respondents were asked how close

they feel to their mother and father figures. The maximum value between closeness to mother and closeness to father was taken and used to create a measure of closeness to parents. Other permutations of this variable were explored, as well as separate scales for fathers and mothers; all resulted in substantively similar findings. Second, we created a dichotomous indicator for respondents whose family of origin was intact at Wave I (in other words, respondents with parents who were married to each other). Our final measure of social integration captures how involved respondents are with religious organizations, a known protective factor for suicide (Pescosolido and Georgianna 1989). At Wave IV, respondents were asked how often they attended religious services. Responses ranged from "never" to "once a week, or more." Items were reverse coded so that a higher value on this measure indicates more frequent religious attendance.

In addition to social integration, our models include controls for demographic factors. These include respondent's age, biological sex, race, sexual orientation, parents' education level, respondent's education level, socioeconomic status, employment status, and military status. Race is coded as five of the dichotomous variables: Latino, Black, Asian, and Other, with White as the reference category. Sexual orientation was measured by respondents' identification of their sexual identity ranging from 100 percent homosexual to 100 percent heterosexual (with not attracted to males or females as an option). Those who reported being "bisexual," "mostly homosexual (gay), but somewhat attracted to people of the opposite sex," and "100% homosexual (gay)" were coded as 1. Heterosexual, asexual, and mostly heterosexual respondents were coded as 0. Parents' education was taken from the parent questionnaire (at Wave I) 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 for less than high school graduation; 2 for high school diploma or equivalent; 3 for some college, but did not graduate; 4 for graduated from a college or university; and 5 for professional training beyond a 4-year college or university. Four dichotomous indicators of respondents' highest degree attained also are included in all models. The indicators include whether respondents dropped out of high school (1/0), have a high school diploma or equivalency, have completed some college but do not have a bachelor's degree (0/1), and whether they have a bachelor's or graduate degree (which serves as our reference group; 0/1). Models also include respondents' self-reported socioeconomic status. Respondents were asked on a scale of 1–10 to identify their own status in terms of both education and income relative to other Americans. In addition to socioeconomic status and education, we include a flag for respondents who are currently unemployed. Finally, because serving in the military during times of war is a risk factor for suicide (Cesur, Sabia, and Tekin 2013), we control for whether respondents have served or are serving in the military.

Analytic Plan

To investigate our research questions, we estimate a series of nested logistic regression models controlling for respondents' history of suicidal thoughts at Wave I. As a first step, we estimate the relationships between a role model's suicide attempt (at Wave III or IV) and the likelihood of suicide ideation and attempt (at Wave IV) controlling only for adolescent psychological risk factors to determine whether suicide contagion is part of the suicidal process of young adults above and beyond respondents' psychological histories. Next, we add our set of demographic controls and measures of social integration to the model to determine how robust the impact of suicide contagion is to potentially confounding risk and protective factors. Finally, we add measures of psychological risk factors in young adulthood. A suicidal role model may increase other aspects of psychological distress in young adulthood (such as depression or sleep problems), and it is important to determine whether contagion exists above and beyond these important controls.

All models are estimated using the SurveyLogistic Procedure in SAS 9.3 (An 2002) to account for the complex sampling frame of the Add Health data. In addition, all models include normalized sample weights to compensate for Add Health's sampling design and sample attrition. 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

Suicide Contagion in Young Adulthood

To begin our examination of suicide contagion in young adulthood, we start by analyzing the relationship between experiencing a role model's suicide attempt at Wave IV and respondent's suicidality at Wave IV. Our first model, presented in Table 2, estimates the effect of role model suicide attempts net of adolescent psychological risk factors and finds that, on average, there is a strong and significant association between having a role model attempt suicide and respondents reporting suicidal thoughts (Odds Ratio [OR] = 2.186, $p < .0001$). In Model 2, we add important demographic and social controls to the model to see whether these factors explain the significant association between role models and respondents' suicide ideation. In Model 2, respondents' odds of reporting suicide ideation remain significantly higher if they also report having a friend or family member attempt suicide in the past 12 months (OR = 1.990, $p < .0001$), net of these additional controls. Model 3, our saturated model, adds psychological risk factors in young adulthood, such as diagnosed depression, alcohol abuse, and troubled sleep, to the model. Net of all controls, on average, respondents who report having a role model attempt suicide are 1.878 times more likely to report suicidal thoughts ($p = .0007$).

Models 4, 5, and 6 in Table 2 analyze the effect of role models on respondent's likelihood of attempting suicide in the past 12 months. The pattern of our findings is similar to our findings regarding respondents' suicide ideation (Models 1–3). Though our measures of demographic characteristics and social integration (Model 5) and young adult psychological risk factors (Model 6) mediate some of the relationship between role model's suicide attempts and young adults' likelihood of reporting a suicide attempt, respondents who have had a friend or family member attempt suicide in the past 12 months are significantly more likely to report suicide attempts at Wave IV. Specifically, net of all other variables, our saturated model (Model 6) shows that on average, respondents who report that a friend or family member attempted suicide are 3.526 times more likely to also report that they have attempted suicide in the last 12 months ($p = .003$).

The Longitudinal Effect of a Role Model's Suicide Attempt

Next we turn our attention to examining whether the significant association between role models and respondents' suicidality lasts over time (Table 3). To do this, we examine whether respondents who report that a family member or friend attempted suicide at Wave III are more likely to report suicide ideation and suicide attempts at Wave IV, net of our control variables. Table 3 presents these results. We begin again with our most basic model that only controls adolescent psychological risk factors, including our prior measure of our dependent variable (suicide ideation and attempts at Wave I). Model 1 shows that, net of respondents' histories of suicidality, respondents who had a role model attempt suicide (at Wave III) are 1.504 times more likely to report suicidal thoughts at Wave IV, which is approximately 6 years later ($p = .006$). Model 2 adds our controls for social integration and demographic characteristics and reveals that this association remains significant net of these controls: On average, young adults who report that a friend or family member attempted suicide at Wave III are 1.370 times more likely to report suicidal thoughts at Wave IV, net of all other factors ($p = .038$). Model 3 adds psychological risk

Table 2. Estimates from Logistic Regressions of Young Adults' Suicide Ideation and Attempts at Wave IV on Role Model's Suicide Attempt at Wave IV.

	Suicide ideation						Suicide attempt					
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Regressions	*OR*	Sig	*OR*	Sig	*OR*	Sig	*OR*	Sig	*OR*	Sig	*OR*	Sig
Suicide contagion												
Role model suicide attempt (Wave IV)	2.186	***	1.990	***	1.878	***	4.438	***	3.984	***	3.526	**
Psychological risk factors in adolescence												
Suicide attempt (Wave I)	4.531	***	3.981	***	2.975	***	7.580	***	5.212	***	3.557	***
Suicide ideation (no attempts; Wave I)	2.383	***	2.271	***	1.951	***	3.333	***	2.948	**	2.313	
Childhood emotional abuse (Y/N)	2.103	***	1.916	***	1.667	***	2.752	**	2.364	*	2.022	
Childhood physical abuse (Y/N)	1.754	***	1.529	**	1.394	*	1.317		1.320		1.152	
Childhood sexual abuse (Y/N)	1.604	*	1.559	*	1.369		2.281		1.913		1.694	
Psychological risk factors in young adulthood												
Diagnosed depression	—		—		3.924	***	—		—		6.296	***
Alcohol abuse/dependence	—		—		1.226		—		—		1.111	
Sleep problems	—		—		1.732	***	—		—		1.273	
Social integration												
Married	—		1.180		1.146		—		2.198		2.075	
Cohabiting	—		1.318		1.306		—		1.135		1.150	
Divorced	—		1.115		0.982		—		1.496		1.289	
Single or dating (Ref)	—		—		—		—		—		—	
Has children (Y/N)	—		0.763	*	0.795		—		0.488		0.496	
Very happy with current romantic partner	—		0.480	***	0.544	***	—		0.872		0.979	
Not happy with current romantic partner	—		1.150		0.995		—		1.895		1.563	
Closeness to romantic partner	—		0.988		0.983		—		0.906		0.913	
Closeness to parents	—		0.849	**	0.848	**	—		0.886		0.889	
Intact family of origin in adolescence (Wave I)	—		0.993		1.027		—		1.200		1.326	
Religious attendance	—		0.985		1.011		—		1.040		1.041	
Demographic factors												
Female	—		0.943		0.808		—		1.351		1.176	
Age	—		0.992		0.989		—		1.012		1.000	
African American	—		0.775		1.006		—		0.533		0.778	
Asian or Asian American	—		0.845		0.958		—		<0.001	***	<0.001	***
Latina/o	—		0.671	*	0.779		—		0.339	*	0.414	
Other race or ethnicity	—		1.028		1.084		—		0.145	*	0.155	*
White (reference group)	—		—		—		—		—		—	
Parents' education level	—		0.969		0.962		—		1.139		1.145	
Socioeconomic status	—		0.791	***	0.836	***	—		0.766	**	0.828	
Gay, lesbian or bisexual identity	—		1.588	*	1.369		—		2.200		1.760	
Unemployed (Y/N)	—		1.928	***	1.763	**	—		2.212	*	1.931	
Served in the military	—		1.533	*	1.492		—		1.479		1.406	
Educational attainment												
No degree	—		0.897		0.778		—		4.681	*	4.407	*
High school degree	—		0.857		0.859		—		3.476	*	3.733	*
Some college	—		0.957		0.882		—		2.356		2.227	
Bachelor's degree (or higher; Ref)	—		—		—		—		—		—	
−2 log likelihood	4769.317		4446.755		4160.006		900.861		792.241		738.836	
Response profile (n = 1/n = 0)	(679/10173)		(679/10173)		(679/10173)		(84/10768)		(84/10768)		(84/10768)	
N	10852		10852		10852		10852		10852		10852	

Source. The National Longitudinal Study of Adolescent Health.
Note. OR = odds ratio.
*p < .05. **p < .01. ***p < .001 (two-tailed tests).

factors for suicide at Wave IV—namely diagnosed depression, alcohol abuse, and sleep problems—and these factors explain away the significant effect of role model's suicide attempt on young adults' suicidal thoughts 6 years after the role model's attempt. This may suggest that one

Table 3. Estimates from Logistic Regressions of Young Adults' Suicide Ideation and Attempts at Wave IV on Role Model's Suicide Attempt at Wave III.

	Suicide ideation						Suicide attempt					
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Regressions	*OR*	Sig	*OR*	Sig	*OR*	Sig	*OR*	Sig	*OR*	Sig	*OR*	Sig
Suicide contagion												
Role model suicide attempt (Wave III)	1.504	**	1.370	*	1.193		2.668	**	2.520	*	2.189	*
Psychological Risk factors in adolescence												
Suicide attempt (Wave I)	4.449	***	3.898	***	2.928	***	7.397	***	5.182	***	3.548	***
Suicide ideation (no attempts; Wave I)	2.334	***	2.222	***	1.934	***	3.134	**	2.640	*	2.203	
Childhood emotional abuse (Y/N)	2.133	***	1.943	***	1.689	***	2.863	**	2.506	*	2.157	*
Childhood physical abuse (Y/N)	1.735	***	1.508	**	1.395	*	1.256		1.273		1.122	
Childhood sexual abuse (Y/N)	1.648	**	1.622	*	1.407		2.511	*	2.086		1.796	
Psychological risk factors in young adulthood												
Diagnosed depression	—		—		3.916	***	—		—		6.347	***
Alcohol abuse/dependence	—		—		1.240		—		—		1.203	
Sleep problems	—		—		1.743	***	—		—		1.317	
Social integration												
Married	—		1.144		1.117		—		2.108		2.036	
Cohabiting	—		1.298		1.285		—		1.127		1.160	
Divorced	—		1.126		0.988		—		1.635		1.393	
Single (Ref)	—		—		—		—		—		—	
Has children (Y/N)	—		0.775		0.803		—		0.479	*	0.494	
Very happy with current romantic partner	—		0.473	***	0.542	***	—		0.871		1.010	
Not happy with current romantic partner	—		1.150		0.999		—		1.935		1.558	
Closeness to romantic partner	—		0.992		0.985		—		0.910		0.907	
Closeness to parents	—		0.847	**	0.846	**	—		0.885		0.896	
Intact family of origin (Wave I)	—		0.990		1.023		—		1.226		1.354	
Religious attendance	—		0.987		1.016		—		1.064		1.078	
Demographic factors												
Female	—		0.942		0.812		—		1.376		1.215	
Age	—		0.995		0.989		—		1.029		1.009	
African American	—		0.789		1.017		—		0.576		0.850	
Asian or Asian American	—		0.838		0.950		—		<0.001	***	<0.001	***
Latina/o	—		0.655	*	0.760		—		0.325	*	0.395	
Other race or ethnicity	—		1.015		1.070		—		0.120	*	0.121	*
White (reference group)	—		—		—		—		—		—	
Parents' education level	—		0.967		0.961		—		1.130		1.142	
Socioeconomic status	—		0.791	***	0.838	***	—		0.773	**	0.844	
Gay, lesbian or bisexual identity	—		1.630	*	1.405		—		2.482		1.986	
Unemployed (Y/N)	—		1.876	**	1.712	**	—		2.141	*	1.838	
Served in the military	—		1.505		1.474		—		1.446		1.400	
Educational attainment												
No degree	—		0.925		0.806		—		5.231	*	5.224	*
High school degree	—		0.863		0.867		—		3.893	**	4.139	**
Some college	—		0.966		0.893		—		2.571	*	2.406	
Bachelor's degree (or higher; Ref)	—		—		—		—		—		—	
−2 log likelihood	4792.905		4466.069		4178.390		915.450		803.751		749.089	
Response profile (n = 1/n = 0)	(679/10173)		(679/10173)		(679/10173)		(84/10768)		(84/10768)		(84/10768)	
N	10852		10852		10852		10852		10852		10852	

Source. The National Longitudinal Study of Adolescent Health.
Note. OR = odds ratio.
*p < .05. **p < .01. ***p < .001 (two-tailed tests).

way that suicide contagion operates over the long run is by increasing psychological distress and its co-morbidities (such as substance abuse and sleep problems) that in turn have their own significant and independent association with a heightened risk for suicidality.

Next, we investigate the effect of role model's suicide attempts at Wave III on young adults' likelihood of reporting a suicide attempt at Wave IV (Models 4–6 in Table 3). The pattern remains almost identical to the pattern observed for suicide ideation; our controls for respondents' psychological well-being, social integration, and demographic factors partially explain why suicide contagion is observed. The major difference is that the significant effect of role model's suicide attempt on respondent's reports of having attempted suicide in the last 12 months remains significant in our saturated model (Model 6). Specifically, net of psychological risk factors in young adulthood and adolescence, measures of social integration, and demographic characteristics, young adults who report a role model attempted suicide at Wave III are, on average, 2.189 times more likely to report a suicide attempt approximately six years after the role model's attempt than their otherwise similar peers who have not had a role model attempt suicide ($p = .049$).

Finally, it is worth mentioning the strong and significant relationship between respondents' history of suicidality at Wave I and their suicidal thoughts and suicide attempts at Wave IV. Attempting suicide in adolescence significantly and substantially increases the odds that a respondent will report suicide ideation and even a suicide attempt in young adulthood. This is one of the most robust and consistent predictors of suicidality in our models. The only other consistently significant risk factors are being diagnosed with depression at Wave IV, experiencing emotional abuse as a child, and having a role model attempt suicide.

Taken as a whole, our findings indicate that suicide contagion may be a significant risk factor for suicide in young adulthood and that contagion does not require bounded social contexts to be salient.

Discussion

Sociological research on suicide has predominantly followed the Durkheimian tradition, emphasizing how social ties protect individuals from suicide through social integration and moral regulation. This emphasis is at odds with existing research on the negative impact social ties can have on individuals' health, well-being, and even likelihood of reporting suicidal thoughts or attempts. With this study, we add to the growing body of literature that demonstrates that close social relationships can serve not just as sources of support, but also as conduits for the spread of suicidal behaviors. We find that when a close friend or family member attempts suicide, young adults are more likely to report suicidal thoughts and even attempts, net of important psychological and sociological controls, such as that person's history of suicidality prior to the attempt of their friend or family member. We also find that the suicide attempt of a friend or family member can play an essential and long-term role in an individual's suicidality. Even six years later, a significant association is observed between a role model's suicide attempt and a respondent's suicide ideation and attempts, though the respondent's psychological distress in young adulthood mediates the relationship to some extent. Our findings provide further evidence that the sociology of suicide must evolve and consider both the protective and harmful effects that social relations can have on an individual's suicidality.

Our study has three primary implications for advancing the sociological understanding of suicide generally and the sociological research on suicide contagion specifically. First, prior research on suicide contagion has focused almost exclusively on the adolescent population. Because adolescents have several characteristics that may render them particularly vulnerable to suicide contagion as a mechanism, we cannot extrapolate findings from studies of adolescents to other stages of the life course, and thus our understanding of suicide contagion has been limited. By examining young adults, who, while temporally close to adolescents in terms of years, do not have the same inherent vulnerabilities to peer influence, we can be more confident that suicide contagion is an important sociological mechanism in the suicide process.

Second, prior research on the social contagion of suicide has primarily examined populations whose lives are focused within bounded social spaces, such as high schools, psychiatric wards, or Native American reservations. While it makes sense that bounded social spaces may increase the salience of suicide contagion or may amplify social contagion processes, it is important to determine whether contagion is dependent upon a bounded social space. Young adults' lives are not constrained to one social environment as is often the case with adolescents and high schools. Thus, by examining contagion in young adulthood, we are able to provide evidence that the contagion of suicide is likely not dependent on bounded social contexts as long as a direct relationship between an individual and the suicidal role model exists. Put differently, when individuals are exposed to the suicide attempt of someone they care about, the exposure is significantly associated with their mental health and likelihood of reporting suicidality.

Third, using longitudinal data that include respondent's histories of suicidality prior to exposure to the suicide attempt of a role model and their suicidality after exposure allows us to test whether contagion is (1) merely a product of pre-existing risk factors for suicidality and (2) how long the significant association between role models' and respondents' suicidality lasts. We find that, in young adulthood, respondents who had a role model attempt suicide are significantly more likely to report attempting suicide over both the short and long run, compared with their otherwise similar peers; even once we take into account important psychological factors (both in adolescence and young adulthood) and measures of risk and protective factors for suicidality. Furthermore, young adults who report that a friend or family member attempted suicide are more likely to report suicide ideation, though over the long run, the relationship between a role model's suicide attempt and a young adult's suicidal thoughts appears to be mediated by psychological distress. Given the potential long-term impact the attempt of a role model has on young adults and how robust this association is to potential mediators, we can be more confident that suicide contagion is a serious and important part of the suicide process.

Despite these important contributions to our understanding of suicide contagion, there are some limitations to this study that are worth noting. First, we focus our analysis of young adults' suicidality on suicidal thoughts and attempts and not suicide deaths due to the limited number of respondents who have died by intentional self-harm in the Add Health data. According to Add Health (2014), only 22 respondents have died due to intentional self-harm, which is insufficient for a multivariate statistical analysis such as this one. Similarly, we are not able to analyze role models who died by suicide and role models who survived a suicide attempt separately because of sample size limitations. In our data, approximately one third of role models completed suicide, and two thirds attempted but did not complete suicide at both Waves III and IV. Considering the intense negative emotions that individuals who have lost a loved one to suicide report (Fine 2000; Linn-Gust and Cerel 2011), future research should endeavor to collect data that allow us to examine this potentially important difference. Also due to data limitations, we were unable to distinguish between friends and family-based role models at Wave IV due to how Add Health asked the survey item. To be consistent, we constructed our Wave III measure of role model suicide attempts to mirror the Wave IV survey item; however, we acknowledge that friends and family may play distinct roles in the suicide contagion process, and future research should investigate how individuals' relationships to the role model condition the experience of suicide contagion. In addition, it was beyond the scope of this study to fully investigate what role shared context may play in suicide contagion. It may be that role models and respondents share environments or experiences that contribute to both the suicide attempt of role models' and the suicidality of respondents. This is an important direction for future research. Finally, while we did our best to account for respondents' vulnerability to suicide prior to exposure to the suicide attempt of a friend or family member, we must acknowledge that survey data are never able to fully account for social selection. Hence, while our study represents an important step forward by using longitudinal data and extensive

controls for other risk and protective factors, we still cannot conclude that the suicide attempt or death of a role model causes an increased risk of suicidality among young adults.

As a final point, it is worth mentioning that there are important gender and race and ethnic differences in suicidality that we were unable to examine with our data (Baca-Garcia et al. 2008; Stack 2000). Suicide ideation is rare in young adulthood, and suicide attempts are rarer still. Likewise, only approximately 6 percent of young adults report experiencing the suicide attempt of a role model. Given our desire to analyze the intersection of these two relatively rare events to understand important issues relating to suicide contagion, we had to neglect potential gender and race or ethnic differences in the experience of a role model's suicide attempt. This omission should be addressed by future research. We suggest that future research (1) use qualitative methods to analyze gender and race/ethnic differences in the experience of role models' suicide attempts or deaths or (2) focus on other measures of mental health and well-being, such as emotional distress, alcohol abuse, or sleep problems, that may shed light on important aspects of the experience of a role model's suicide attempt or death.

Conclusion

Despite its divergence from the dominant sociological Durkheimian model of suicide, the propensity for suicides to spread via social ties is widely recognized by sociologists, public health researchers, and suicide prevention specialists. Regardless of life-course stage or the presence of a bounded social context, experiencing the suicide death or attempt of a significant other can greatly increase the likelihood that a person reports serious suicidal thoughts or even suicide attempts. For young adults, similar to adolescents, social ties have the potential to both protect and place them at risk of suicide. Knowing that two or more individuals are closely integrated does not reveal important information about the norms or qualities embedded within those social ties. While sociology's main contribution to the scientific study of suicide undoubtedly has evolved from Durkheim's classic study, sociology has the tools to broaden our contribution to suicidology and help prevent one of the leading causes of death in the early life course. Thus, we argue that the next important task for the sociology of suicide is to integrate Durkheim's important insights about the power of socially integrative ties with insights from social psychology, sociology of emotions, and social network theories to create a more robust and comprehensive understanding of how social forces condition suicidality.

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Note

1. We use the longitudinal sample weight GSWGT4_2 because we do not use data from Wave II of Add Health.

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