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2008

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## Suicidal Ideation in College Students Varies Across Semesters: The Mediating Role of Belongingness

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The interpersonal–psychological theory of suicidal behavior (Joiner, 2005) proposes that the need to belong is fundamental; when met it can prevent suicide and when thwarted it can substantially increase the risk for suicide. We investigate one source of group-wide variation in belongingness among college students—changes in the social composition of college campuses across academic semesters—as an explanation for variation in suicidal ideation across the academic year. Our results indicate that in a sample of college students at a large southern state university ( $n = 309$ ), suicidal ideation varied across academic semesters, with highest levels in summer compared to both spring and fall. Differences in suicidal ideation between summer and spring were, in large part, accounted for by belongingness. Theoretical, as well as practical, implications are discussed regarding mechanisms for seasonal variation in suicidal ideation.

According to Baumeister and Leary (1995), feeling disconnected or uncared for by others are not just painful emotional states but represent the thwarting of a fundamental human need—the need to belong. The interpersonal–psychological theory of suicidal behavior (Joiner, 2005) proposes that the need to belong is so fundamental that when it is met it can prevent suicide but when thwarted, it substantially increases risk for suicide (cf. Durkheim, 1897, who proposed that suicide results, in part, from failure of social integration). Furthermore, the theory posits that an individual will not die by suicide unless he/she has both the desire to die by suicide and

the ability to do so, and that one cause of suicidal desire is thwarted belongingness.

One of the clearest findings in the literature on suicide is that individuals who die by suicide often experience social isolation and social withdrawal before their deaths (e.g., Trout, 1980). Numerous research groups have replicated the association between loneliness and suicide (Bonner & Rich, 1987; Dieserud, Roysamb, Ekeberg, & Kraft, 2001; Koivumaa-Honkanen et al., 2001; Roberts, Roberts, & Chen, 1988; Stravynski & Boyer, 2001; Waern, Rubenowitz, & Wilhelmson, 2003). These studies suggest that thwarted belongingness may be expressed as intense feelings of loneliness. Additionally, studies across multiple disciplines have reported that living alone is a risk factor for suicidal behavior (Conner, Duberstein, & Conwell, 1999; De Leo, Padoani, & Scocco, 2001; Gove & Hughes, 1980) and that rates of suicidal be-

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havior are lower in married persons than nonmarried persons (e.g., Stack, 2000), suggesting that living with others may provide some protection from suicide. Further evidence of the psychological benefits of belonging suggests that connections with children protect against suicide (Hoyer & Lund, 1993; Qin & Mortensen, 2003). Assuming that suicidal desire is a prerequisite for suicidal behavior, these findings are supportive of the hypothesis that thwarted belongingness contributes to a desire for suicide.

The investigations of thwarted belongingness reviewed above involve comparisons between individuals with met versus unmet needs to belong, indicating that one source of thwarted belongingness is likely individual differences in experiences with social exclusion and inclusion. However, another potential source for variation in belongingness involves events or changes that influence whole social groups. In this paper, using the interpersonal–psychological theory of suicidal behavior as a guiding theoretical framework, we investigate one source of group-wide variation in belongingness—changes in the social composition of college campuses across academic semesters. We explore this group-level shift in belongingness as an explanation for variation in suicidal ideation in college students across semesters.

Of particular interest for the current study, is whether changes in belongingness at the level of larger social groups been found to predict suicide. A sociological perspective is especially helpful in answering in this question. At the beginning of the twentieth century, Durkheim (1897) proposed that dysregulated social forces, including lowered social interaction, contributed to population-wide increases in suicide rates. Recently, members of our research group studied a related social force, namely, “pulling together” processes associated with sporting events (Joiner, Hollar, & Van Orden, 2005). We found that successful football team seasons, the U.S. hockey team’s “Miracle on Ice,” and Superbowl Sundays all predicted lower suicide rates—in our view, through increases in ca-

maraderie and face-to-face social contact, which together increased belongingness. Other researchers have documented sports-related pulling together effects: during seasons when the Montreal hockey team was eliminated early on in the Stanley Cup, suicide rates in young men were elevated (Trovato, 1998). Evidence also suggests that pulling together effects may be operative at times of national tragedies. Declines in suicidality have been documented following the assassination of President John F. Kennedy (Billler, 1977), the terrorist attacks on September 11, 2001 (Salib, 2003), and Hurricane Katrina in New Orleans (Kessler, Galca, Jones, & Parker, 2006), as well as during wars supported by the public (Stack, 2000).<sup>1</sup> Taken together, these studies provide converging support for the hypothesis that events engendering a sense of shared experience and increased community in the population (i.e., pulling together) may decrease suicide rates through increased belongingness.

Changes in belongingness at the level of larger social groups have also been investigated as a potential mechanism explaining seasonal variation in suicide. Considerable research has documented seasonal variation in suicide (both lethal and nonlethal attempts), with many studies documenting the highest suicide rates in spring and the lowest rates in winter (Fossey & Shapiro, 1992; Chew & McCleary, 1995; Barker, Hawton, Fagg, & Jennison, 1994; Jessen et al., 1999; Masterton, 1991; Yip & Yang, 2004; Wenz, 1977). Declines in lethal and nonlethal suicide attempts during the November and December holiday season have been interpreted as indicative of increased affiliation with

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1. Regarding the association between war and decreased suicide rates, Stack (2000) suggested that this association may be due to factors other than social integration (c.f., belongingness); namely, decreases in unemployment and alcohol consumption. It is unclear if pulling together effects at wartime, if present, contribute to reductions in suicide rates above and beyond these other factors.

friends and family and an enhanced sense of belongingness (Ajdacic-Gross et al., 2003; Masterton, 1991).

If belongingness can indeed account for seasonal variation in suicide, then social groups affected by changes in belongingness due to other social patterns (i.e., other than the calendar year) should evidence variation in suicidality that corresponds to those social patterns. The academic calendar on university campuses is one such social pattern. A consistent finding in the literature is that U.S. college students aged 18–24 have lower suicide rates—approximately half—compared to their same age and gender peers in the population (Schwartz, 2006a; Silverman, Meyer, Sloane, Raffel, & Pratt, 1997). This finding has held true since the 1960s (Schwartz, 2006b). The belongingness conferred by participation in a college campus community in the form of student support services and peer companionship has been put forth as one explanation for the seemingly protective nature of college attendance (Silverman et al., 1997). Consistent with this hypothesis is the finding that students in fraternities and sororities are less likely to experience suicidal ideation (Brener, Sabur Hassan, & Cohen Barrios, 1999). Despite lower suicide rates, the proportion of college students seriously considering suicide each year (approximately 9.5%) still warrants concern and attention, given that the majority of these young people do not receive treatment (Kisch, Leino, & Silverman, 2005). In addition, it may be that the protective factors inherent in college attendance are not held constant throughout the year; it is this possibility that the current study addresses. Being a member of a college community may afford protective factors during the standard academic year (i.e., fall and spring semesters) through various opportunities for social engagement in dormitories, classes, sport fandom, and other extracurricular activities. Because a substantially smaller number of students enroll in courses during the summer semesters and fewer extracurricular activities are available at that time, it is conceivable

that students' sense of belongingness may be lower in the summer than in other semesters. Consequently, suicidal ideation may be higher in the summer than during the regular academic year.

In the current study we examined whether suicidal ideation in college students varies across the academic calendar (i.e., summer, fall, and spring semesters) and analyzed the role that belongingness plays in that variation. We chose to investigate suicidal ideation given our use of the interpersonal–psychological theory of suicidal behavior as a framework. Specifically, we postulated that students attending the summer semester when enrollment is low would experience higher levels of suicidal ideation than students in the fall and spring semesters due to decreases in belongingness. We hypothesized that (1) suicidal ideation will vary across academic semesters, with highest levels in summer; (2) belongingness will vary across academic semesters given fluctuations in stability and frequency of interpersonal interactions across semesters and will be lowest in summer; and (3) belongingness will mediate the relationship between semester and suicidal ideation.

## METHOD

### *Participants*

Participants were 309 undergraduates in an introductory psychology class who received course credit for participation. The majority of the sample was female ( $n = 226$ , 73%). The mean age for the sample was 19 years (range: 17–51 years). The number of students participating per semester was as follows: spring  $n = 100$ , summer  $n = 62$ , and fall  $n = 147$ .

### *Procedures*

Data for this study were collected as part of a larger study on interpersonal behaviors and suicidal symptoms. Participants first

reviewed and signed a statement of informed consent detailing the Human Subjects Committee approval, as well as the purpose, procedures, and goals of the study. Participants completed a self-report questionnaire packet; only those questionnaires relevant to the current analyses will be described below. Responses to the questions about suicide were screened by the experimenters for severe and imminent suicide risk. All participants were debriefed and given phone numbers for local mental health services. Data was collected during all three academic semesters (i.e., fall, spring, and summer) at a large southern university (in Florida). Not all months in each semester were sampled: the spring semester included the months of March and April (the spring semester ends in April at this university); the summer semester included the months of May, June, and July (there are no August classes); and the fall semester included the months of September and October.

### Measures

*Interpersonal Needs Questionnaire* (INQ; Van Orden, Witte, Gordon, Bender, & Joiner, 2008). The INQ was designed to measure participants' beliefs about the extent to which they feel connected to others (i.e., belongingness) as well as other suicide-related constructs. Ten items measured belongingness (e.g., "These days other people care about me" and "These days I feel like I belong"). Participants indicate the degree to which each item is true for them on a 7-point Likert scale. Scores are coded such that higher numbers reflect more positive interpersonal beliefs (i.e., *more* belongingness). Internal consistency for the belongingness items was high ( $\alpha = .90$ ).

*Beck Scale for Suicide Ideation* (BSSI; Beck & Steer 1991). The BSSI is a 21-item self-report inventory designed for the assessment of suicidal ideation. Items 1–19 are used in the following analyses as an index of current suicidal symptoms; items 20 and 21 assess past suicide attempts. A score of 0–2 is

assigned for each item and total scores for the BSSI range from 0–38, where an increase in score represents a higher level of suicidal ideation and possible intent. Internal consistency in this sample for the ideation items was high ( $\alpha = .90$ ).

### RESULTS

To test our hypotheses, we constructed a series of regression equations. First, we hypothesized that suicidal ideation would vary across semesters. More specifically, we predicted higher levels of suicidal ideation in the summer (compared to both fall and spring). In order to test these specific comparisons within a regression framework, we followed the recommendations of Cohen, Cohen, West, and Aiken (2003) and created dummy-coded variables to represent "semester." The first equation used "semester" to predict suicidal ideation, with spring and fall as the predictors and summer as the reference group. This allowed us to test our *a priori* prediction that levels of suicidal ideation in the spring and fall would both differ from the level in the summer. The omnibus test for the relationship between "semester" and suicidal ideation approached the standard criterion for statistical significance,  $F(2, 306) = 2.85, p = .06$ , suggesting that suicidal ideation may have varied across academic semesters.

We made *a priori* predictions about specific comparisons between semesters, thus we conducted these comparisons in spite of a marginally-significant omnibus test. An inspection of the means for suicidal ideation presented in Table 1 indicates that the highest level of suicidal ideation occurred in summer ( $M = 1.5, SD = 3.54, \text{range} = 14$ ), followed by fall ( $M = .66, SD = 2.30, \text{range} = 20$ ) and spring ( $M = .57, SD = 2.32, \text{range} = 17$ ). The mean difference for suicidal ideation for summer versus spring was theoretically and clinically significant (approximately 1 point on the BSSI) and statistically significant ( $B = -.93, t(306) = -2.21, p = .03$ ), indicating that suicidal ideation was significantly higher in

**TABLE 1**  
*Descriptive Statistics for Suicidal Ideation and Belongingness*

	Spring <i>n</i> = 100	Summer <i>n</i> = 62	Fall <i>n</i> = 147	Total <i>n</i> = 309
Suicidal ideation				
<i>M</i>	.57	1.50	.66	.80
<i>SD</i>	2.32	3.54	2.31	2.62
<i>Range</i>	17	14	20	20
Belongingness				
<i>M</i>	5.75	5.33	5.48	5.54
<i>SD</i>	1.00	1.26	1.13	1.13
<i>Range</i>	4.50	5.20	5.30	5.30

summer compared to spring. The mean difference for suicidal ideation for summer versus fall was also theoretically and clinically significant (slightly less than 1 point on the BSSI) as well as statistically significant ( $B = -.84$ ,  $t(306) = -2.13$ ,  $p = .034$ ), indicating that suicidal ideation was significantly higher in summer compared to fall. Thus these results are consistent with our first hypothesis.

Our second hypothesis was that levels of belongingness would vary by semester and that levels of belongingness would be lowest in the summer semester. We conducted the analyses described above, but this time with “semester” predicting levels of belongingness (with spring and fall as the predictors and summer as the reference group). As in the above analyses, this allowed us to test our *a priori* prediction that levels of belongingness in spring and fall would both differ from summer. The omnibus test of the relationship between “semester” and belongingness was statistically significant,  $F(2, 306) = 3.13$ ,  $p = .045$ . An inspection of the means for belongingness presented in Table 1 indicates that the *lowest* level of belongingness occurred in summer ( $M = 5.33$ ,  $SD = 1.26$ ), followed by fall ( $M = 5.48$ ,  $SD = 1.13$ ) and spring ( $M = 5.75$ ,  $SD = 1.00$ ). Consistent with predictions, the mean difference for belongingness in summer versus belongingness in spring was approximately one-half a point on the INQ and was statistically significant ( $B = -.43$ ,  $t(306) = 2.36$ ,  $p = .019$ ), indicating that

belongingness was significantly lower in summer compared to spring.<sup>2</sup> Contrary to predictions, the mean difference for belongingness in summer versus belongingness in fall was less than one-quarter of a point on the INQ and was not statistically significant ( $B = .16$ ,  $t(306) = .91$ ,  $p = .362$ ), indicating that belongingness did not differ significantly between summer and fall (though the nonsignificant difference was in the predicted direction).

To test our third hypothesis (belongingness would mediate the relationship between “semester” and suicidal ideation), we constructed an additional series of regression equations, following the recommended procedure of Baron and Kenny (1986). This procedure involves three steps. In Step 1, the relationship between the predictor (semester) and the outcome (suicidal ideation) is examined. Step 1 is identical to the analyses performed to test our first hypothesis. As described above, we found support for Step 1

2. To examine whether the relationship between season and belongingness might be accounted for by differences in the types of students who attend summer courses, as opposed to differences in social environment (i.e., fewer opportunities for belongingness), we compared self-reported GPAs of students enrolled in the summer semester (all students, not just those in our sample) to those of students enrolled in spring. These data were obtained from the Florida State University Registrar. No significant differences were found.

for both summer versus spring, as well as summer versus fall. In Step 2, the relationship between the predictor (semester) and the proposed mediator (belongingness) is examined. Step 2 is identical to the analyses performed to test our second hypothesis. For Step 2, we found support for summer versus spring (but not summer versus fall). As a result, we provide results of Step 3 for mediation with regards to the seasonal difference of summer versus spring only. In Step 3, the relationship between the predictor (summer vs. spring) and the outcome (suicidal ideation) is examined in the presence of the proposed mediator (belongingness). Evidence for mediation is present when the effect of the predictor on the outcome is significantly reduced. A regression equation was constructed with season (with spring and fall as the predictors and summer as the reference group) and belongingness as predictors and suicidal ideation as the dependent variable (see Table 2). As predicted, only belongingness significantly predicted suicidal ideation ( $B = -.79$ ,  $t(305) = -6.35$ ,  $p = .000$ ). In the presence of the mediator (belongingness), the effect of semester (summer vs. spring) was reduced in magnitude and became nonsignificant ( $B = -.59$ ,  $t(305) = -1.48$ ,  $p = .140$ ), indicating mediation. Applying Baron and Kenny's adaptation of Sobel's (1982) formula for computing the magnitude of indirect effects, we found the indirect effect leading from semester (summer vs. spring) to suicidal ideation via belongingness to be significant ( $z = -2.22$ ,  $p = 0.03$ ). Thus, belongingness appears to

significantly mediate the relationship between semester and suicidal ideation.

## DISCUSSION

The results of our study indicate that, in a sample of undergraduate students, levels of self-reported suicidal ideation varied across academic semesters. Specifically, consistent with our predictions, levels of suicidal ideation were higher in the summer semester compared to both the spring and fall semesters. Furthermore, we found partial support for our hypothesis that self-reported belongingness would vary across semesters. Levels of belongingness were significantly lower in the summer as compared to the spring semester (whereas levels of belongingness did not significantly differ between summer and fall). Finally, we hypothesized that the students attending classes during the summer semester—when attendance is lower—would experience lower levels of belongingness, which would account for higher levels of suicidal ideation in the summer semester. We found that belongingness mediated the relationship between semester and suicidal ideation, such that variation in suicidal ideation across academic semesters (due to differences between summer and spring) seems to be accounted for, in large part, by decreased belongingness.

Our results indicated higher levels of suicidal ideation in the summer semester (months of May, June, July) compared to

**TABLE 2**  
*Multiple Regression Equations with Belongingness and Season Predicting Suicidal Ideation*

Predictors	<i>B</i> for Predictors	<i>F</i> for set	<i>t</i>	<i>df</i>	<i>p</i>
1		42.67		1, 307	.000
Belongingness	-.81		-6.54	1, 307	.000
2		15.57		3, 305	.000
Belongingness	-.79		-6.35	1, 307	.000
Spring	-.60		-1.48	1, 307	.140
Fall	-.72		-1.93	1, 307	.055



both the spring semester (months of March and April) and the fall semester (months of September and October). For the general population, results of studies on variation in suicide over the calendar year consistently find a spring peak. In contrast, our results indicate a summer peak. These discrepant findings point to the advantage of investigating mechanisms (i.e., proximal causes) that can account for seasonal (and other sources) of variation in suicidality.<sup>3</sup> Without investigating mechanisms, it is difficult to understand discrepant findings and, more importantly, to generalize results beyond the sample studied. Our findings suggest that we should not expect invariant patterns of variation in suicidal symptoms across social groups (e.g., we would not expect a spring peak among college students), rather, we should look for those patients based on belongingness in specific social groups.

It is necessary to evaluate the current findings in terms of the study's strengths and limitations. Regarding strengths, our findings contribute to an understanding of suicidal symptoms in college students and have implications for treatment and prevention (see below). Furthermore, we have offered a theoretical explanation for variation in suicidal ideation across semesters: our results are consistent with the hypothesis of the interpersonal–psychological theory that one source of desire for suicide is thwarted belongingness. Our evidence suggests that changes at the level of a social group (i.e., a college campus across semesters) impact individual levels of belongingness, and thus predict variation in levels of suicidal ideation. The illumination of mechanisms involved in suicidal behavior is important, as deepened scientific understanding of such phenomena could lead to more effective prevention efforts.

Regarding limitations, suicidal ide-

ation and belongingness were assessed using a cross-sectional sampling method. One assumption of mediation is that the dependent variable does not cause either the independent variable or the mediator (Baron & Kenny, 1986). Given the cross-sectional and correlational design of this study, the existence of this kind of causal relationship among the variables cannot be ruled out. We were also unable to include potentially interesting moderators (i.e., gender and age) to determine if belongingness may be a stronger or weaker predictor for different genders or at different ages, as this would have left our analyses underpowered. In addition, future studies are needed to replicate our results given the lower number of participants in the summer semester.

Our design also does not allow us to rule out alternate explanations for lower levels of belongingness during the summer semester. We proposed that due to lowered enrollment in the summer, fewer campus social events would be available, thus reducing belongingness at the level of larger social groups. However, we are unable to discount the possibility that students in the summer semester differ from students in other semesters on variables that could influence belongingness (e.g., extraversion, psychopathology). This alternative explanation suggests that differences in belongingness would be explained by individual differences, rather than by changes in larger social groups. We examined one potential difference (i.e., GPA; see footnote 2) and did not find significant differences across semesters. Future research following the same students longitudinally across seasons would allow for a second method of examination of the role of belongingness as a potential mediator between season and suicidal ideation that could address these limitations. We suggest that our results be viewed as exploratory and potentially generative—as an initial step in the investigation of the role of belongingness as a mechanism in seasonal variation of suicide.

We hypothesized that the lowest levels of belongingness would be found for the summer semester. Our hypothesis was only

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3. Some studies reporting spring peaks include May and June as part of the spring season (e.g., Ajdacic-Gross et al., 2003), which are part of our summer semester. These inconsistencies in the literature further underscore the need for consideration of mechanisms in variation.

partially supported: we did not find a statistically significant difference in levels of belongingness between summer and fall, but did find a significant difference between summer and spring. This indicates that future research is needed to confirm that differences in belongingness across semesters are indeed reliable. It is possible that differences between fall and summer were not found because we were unable to examine levels of belongingness in the winter months (i.e., November and December for the fall semester; January and February for the spring semester). Thus, our comparison of semesters may be better conceptualized as early fall versus late spring versus summer. At the beginning of the fall semester, most students are either returning to campus or arriving for the first time: belongingness may thus be lower at the beginning of fall semester before students have established or reconnected with social networks.

Our results are consistent with both the interpersonal–psychological theory of suicidal behavior and theory on the need to belong, both of which posit a central role for

belongingness in the maintenance of psychological well-being. Our results have some practical implications. Suicide is a serious public health issue, ranking as the third leading cause of death among college-age students (Hoyert, Heron, Murphy, & Kung, 2006), which suggests a need for increased prevention efforts during times when suicide risk is highest for this group. Our results indicate that times of increased risk on college campuses may be times when belongingness declines. For many college campuses, this will be during the summer semester. Thus, suicide prevention efforts on college campuses may consider targeting the summer months, and potentially the early months of the fall semester. Prevention efforts could aim to increase the sense of camaraderie that may decline during summer months when campus populations decrease significantly and fewer social and sporting events are available for the students who remain on campuses. Studies could also test whether the effectiveness of these prevention programs could be accounted for by changes in belongingness.

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Manuscript Received: April 10, 2007  
Revision Accepted: October 25, 2007