

Suicide Prevention with Adolescents

Considering Potential Benefits and Untoward Effects of Public Service Announcements

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Abstract. *Background/Aims:* Suicide is one of the most serious public health challenges; yet determining optimal methods for preventing suicide in adolescents continues to be an elusive goal. The aim of this study was to investigate possible benefits and untoward effects of suicide-prevention public service announcements (PSAs) for adolescents. *Methods:* Adolescent participants ($N = 426$; 56% female) were randomly assigned to one of three conditions: (a) a billboard simulation, (b) a 30-s TV ad simulation, and (c) a no-information condition. *Results:* The results of this study suggest some benefits for the information conveyed by the TV ad (e.g., more knowledgeable about depression). Few benefits were noted for adolescents who were exposed to billboard simulation, and the results raised substantial concerns about possible untoward effects, particularly in adolescents who were exhibiting depressive or suicidal symptoms. Billboard viewers were less likely to favor help-seeking attitudes, perceived PSAs as being less useful, and endorsed more maladaptive coping. *Conclusions:* More research is urgently needed so that well-intended efforts to prevent suicide can more optimally serve the desired goals.

Keywords: suicide prevention, universal prevention, PSA, iatrogenic, adolescents

Introduction

Suicide is a leading cause of death among adolescents (CDC, 2005; WHO, 2004) and is one of the most serious public-health challenges worldwide. Few would discount the importance of sustaining suicide prevention efforts or the imperative to intervene. Yet, preventing suicides continues to be an elusive goal. Important strides have been made in recent years to begin to identify and prioritize objectives for suicide prevention efforts (Mann et al., 2005; World Health Organization, 2004). For example, one strategy advocated by the National Strategy for Suicide Prevention (US Public Health Service, 2001) is universal prevention, including the use of public service campaigns. Responding to these directives, an arsenal of innovative public service announcements (PSAs) has been developed by prominent professional and grassroots organizations, including the American Psychological Association, American Foundation for Suicide Prevention, Suicide Awareness Voices of Education (SAVE), and Yellow Ribbon Suicide Prevention Program. However, evaluation of these recently developed PSAs has been limited.

Suicide prevention campaigns are designed to influence social behavior based on the tenants of social marketing principles (Kotler & Andreasen, 1996). Ideally, PSAs must communicate information by captivating the interest of the

viewer and accordingly modify key attitudes and behaviors (Ajzen & Fishbein, 1980). Some researchers have noted changes in mental health literacy associated with broad efforts to enhance public knowledge (Goldney, Fisher, Dal Grande, & Taylor, 2005). The few studies that examined suicide prevention PSAs with adults provide some support for increasing knowledge but less support for changing attitudes and behaviors (Daigle et al., 2006). When increases in mental health contacts following a PSA campaign have been noted (Dyck, 1993 and Daigle, Brisoux, Raymond, & Girard, 1998 as cited in Daigle et al., 2006; Oliver et al., 2008), these findings have generally been interpreted as meeting the desired campaign goals by increasing requests for help for those in need. However, like other types of media coverage on the topic of suicide, there may be dangers if the message relies on sensationalism (Gould, Jamieson, & Romer, 2003; Shaffer, Garland, Gould, Fisher, & Tautman, 1988). Balancing how best to present information is an ongoing challenge for the field and more research is needed to evaluate the effects of PSAs on potentially vulnerable groups. The purpose of this study was to evaluate suicide prevention messaging for adolescent viewers.

The challenges pertaining to messaging may be particularly pertinent to adolescent viewers. Irrespective of the intended target of suicide prevention campaigns, adolescents are often exposed to these messages. This is because

PSAs are intended to penetrate a market and reach a broad audience. Although there is no research to date evaluating PSAs with adolescents, a considerable body of research has evaluated various aspects of universal prevention programming. School-administered suicide-prevention curricula have at times documented beneficial effects by enhancing knowledge and changing attitudes about suicide risk and prevention among adolescents (reviews provided by Berman & Jobes, 1995; CDC, 1992; Gould, Greenberg, Velting, & Shaffer, 2003; Kalafat, 2003; etc.). Also, the Signs of Suicide curriculum has documented a reduction in the incidents of suicide attempts (Aseltine, James, Schilling, & Glanovsky, 2007), suggesting that prevention efforts may be worthwhile if delivered under specified conditions.

Despite the evidence that suicide prevention efforts are useful, evaluating adolescents' reactions to PSAs is of utmost importance because of possible iatrogenic or untoward effects. These effects have been documented in this age group, particularly in high-risk adolescents (e.g., Davis, Sandoval, & Wilson, 1988; Gould, Greenberg et al., 2003; Shaffer, Garland, Vieland, Underwood, & Busner, 1991; Velting & Gould, 1997). While it is unlikely that a brief message would lead a well-adjusted individual to consider suicide, those already experiencing depression or other forms of psychopathology may be particularly susceptible to potential adverse consequences of universal prevention efforts. Also, youth are thought to be more susceptible to suicide contagion effects (in the form of increased risk in clusters) than are adults (Gould, Jamieson et al., 2003). In particular, high-risk adolescents may be susceptible to messages implying that suicidal thoughts and behaviors are typical or normative. Cialdini (2003) has voiced caution, noting that "There is an understandable, but misguided, tendency to try to mobilize action against a problem by depicting it as regrettably frequent" (p. 105). Finally, there may be potential dangers if the message inadvertently overemphasizes the perceived link between depression and suicide (e.g., Chambers et al., 2005). While some general guidelines are emerging on what factors should be considered in developing these campaigns, efforts are now needed to test if various types of universal suicide prevention messaging are beneficial and safe (Chambers et al., 2005; Beautrais et al., 2007). Research on adolescents is gravely needed to help ensure that well-intended efforts to prevent suicide will optimally serve the desired goals.

This study represents a starting point. We evaluated some of the potential benefits and risks of messages and modalities identified by Chambers et al. (2005) by conducting a PSA simulation study (similar approaches been used to evaluate other health behaviors, e.g., Lorch et al., 2006). Specifically, in this randomized trial, adolescents who viewed a PSA (a TV ad or a billboard) or who received no information were asked to report on their (a) perceptions of utility of PSAs, (b) knowledge of depressive symptoms, (c) normative beliefs, and (d) coping attitudes (help-seeking, maladaptive).

Method

Participants

Recruitment took place in three high schools, resulting in a total of 426 (56% female) adolescent participants, with 164 participants in the billboard condition, 144 in the TV ad condition, and 118 in the no-information condition. The average age of the participants was 15.24 ($SD = .89$) years with 34% in 9th grade, 59.6% in 10th grade, 2.3% in 11th grade, and 4% in 12th grade. The majority of the sample was white (88.7% being Caucasian, 1.4% African American, 2.3% Latin American, 4.7% Asian American, and 2.9% Other), and attending high schools that draw primarily from middle- to upper-middle class suburban families living near Minneapolis, Minnesota.

Recruitment and Experimental Procedures

This research proposal was approved by the Internal Review Board at the University of Minnesota. Principals and/or superintendents provided permission to recruit participants from their schools, and recruitment took place between the spring of 2006 and the spring of 2007. Consent forms were either mailed to the home address or hand-delivered to parents by students. In the 25 required 9th and 10th grade health classes and the 4 elective Stress Management classes from which recruitment took place, there were a total of 707 students enrolled and 655 were in attendance on the day of the experiment (some absences were because of competing required school functions). A total of 482 parental consent forms were returned and 440 parents provided permission for their child to participate in this study. Of these students, 426 of the students volunteered to participate and signed the assent form resulting in 65% of the eligible students participating in this study (class recruitment varied considerably ranging from 24% to 100%, with the median class having 81% participation). Compensation for participation was provided to the schools (a small stipend for their suicide prevention efforts based on the number of students returning consent forms) and students generally obtained class credit for participating in this study or an alternative assignment.

Participants completed this study within the context of their health classes. First, all participants completed a brief demographic questionnaire that also screens for experience with depression and suicide (Demographic/Screen Measure). Within each class, participants were randomly assigned to one of the three conditions and directed to their designated rooms. The billboard and the TV ad targeting adults were part of an informational campaign developed by SAVE, a Minneapolis based nonprofit suicide-prevention agency. In the billboard condition, participants were asked to imagine they were driving along and they saw this billboard message. They were then shown a large Power-

Point projection (approximately 3 × 5 feet) of the billboard for 5 s. The message read “Prevent Suicide, Treat Depression – See your Doctor” and a middle-aged male was depicted. Similarly, in the TV-ad condition, participants were asked to imagine they were watching television. They watched a 30-s ad that features several adults. Paralleling many of the features of the billboard, but providing considerably more information, the TV ad described depression as “a brain illness,” listed salient symptoms of depression (including “it can even lead to suicide”) and urged depressed individuals to seek medical help (“see your doctor”). Immediately after participants were exposed to the simulated PSA (the billboard or TV ad) or to no information, they were asked to complete the Suicide Awareness Questionnaire. To ensure anonymity of participants, consent/assent forms were handed in and filed separately from questionnaires. Upon completion of the study, instruction was provided by trained volunteers using a standard suicide curriculum developed by SAVE. Students were either screened for depression or given the opportunity to request further contact with health teachers and/or school counselors to discuss concerns about themselves or others.

Measure: Demographic/Screen Measure

This demographic and screening questionnaire included questions regarding the adolescents’ sex, age, grade, ethnicity, etc. To screen for the adolescents’ experience with depression and suicide, adolescents were asked yes/no questions about themselves (e.g., “Have you felt sad all or most of the time for a period of a month or been depressed within the past year?” “Have you done something to try to kill yourself in the past year?”). In this report, the more inclusive risk category was based on adolescents who reported experience with depressive symptoms and/or suicide (22%), while a more restrictive risk category was based on adolescents who reported a suicide attempt (6%).

Measure: Suicide Awareness Questionnaire

A second questionnaire was adapted for this study to evaluate adolescent participants’ (a) perceptions of the utility of PSAs, (b) knowledge of depressive symptoms, (c) normative beliefs, and (d) coping attitudes. With the exception of items that specifically evaluated PSAs (e.g., perceived utility), most of the items were based on previous research scales assessing suicide prevention curriculum (Gould et al., 2004).

Perceived Utility of PSAs

Three items were used to assess perceived utility of PSAs. Participants were asked to rate on a five-point scale (*not at*

all to extremely) how useful they thought PSAs such as a billboard or a TV ad would be in reminding those struggling with depression to seek help (overall usefulness). A second item asked participants to indicate what type of person they expected would benefit from viewing a PSA such as a billboard or a TV ad about depression and suicide. Scores were based on the percentage of the six items endorsed. Response choices included a person who is not experiencing depression, a depressed person, a depressed person who is currently thinking about suicide, etc. The third item asked participants what type(s) of information they thought might be useful in preventing suicide. Scores were based on the percentage of six items endorsed, and response choices included a brief advertisement on television, radio, newspapers, billboards, pamphlets, etc.

Knowledge About Depression

Participants checked “the common symptoms of depression” (e.g., sad or irritable feelings, changes in sleep, thoughts of suicide) from a more inclusive list of symptoms (e.g., colds, lying, laughing a lot). Scores were based on the percent of correct symptoms endorsed.

Normative Beliefs

To evaluate normative perceptions of suicidal thoughts and behavior, participants were asked to estimate how common it is for people their age to (a) seriously think about killing themselves (suicidal ideation), (b) try to kill themselves (suicide attempt), and (c) kill themselves (suicide). Scores reflected their ratings on a six-point scale ranging from .01% to 50%. Participants also rated on a six-point scale (from .01% to 50%) how common it is for people who are struggling with depression to commit suicide in order to evaluate whether they overestimated the link between depression and suicide.

Coping Attitudes

To evaluate coping attitudes, participants completed the help-seeking and maladaptive-coping scales (Gould et al., 2004 reported Cronbach’s α coefficients of .60 for the help-seeking and .54 for the maladaptive-coping scale based on factor analytically derived scales). For the five-item help-seeking scale (Cronbach’s $\alpha = .58$), participants were asked to rate, on a five-point scale (*never to always*), a number of help-seeking behaviors (e.g., get advice from another friend, tell my friend to see a mental health professional, talk to an adult about my friend). For the seven-item maladaptive-coping scale (Cronbach’s $\alpha = .50$) participants were asked to indicate if they agreed or disagreed (two items on a five-point scale were converted to a true-false scale) with a number of statements (e.g., suicide is a pos-

Table 1. Adolescent's perceptions of usefulness, knowledge of depression, normative beliefs, and coping

	Billboard	TV ad	No Info	ME Group	ME Risk	ME Sex	Interaction
Utility of PSAs (Usefulness)							
Overall "usefulness"	2.53 (.85)	2.65 (.91)	2.77 (1.02)	3.37*	.13	.10	NA
Types of people	2.81 (1.89)	3.26 (1.93)	2.63 (1.79)	4.74**	.11	2.30	NA
Types of PSAs	2.78 (1.54)	2.95 (1.58)	2.82 (1.54)	2.05	6.55** ^{SR}	.11	G × S *
Depression Knowledge							
Symptoms (correct)	.89 (.15)	.91 (.13)	.87 (.17)	3.87*	.15	28.02***	G × R*, R × S*
Symptoms (incorrect)	.26 (.26)	.24 (.24)	.26 (.26)	.37	5.58*	1.58	NA
Normative beliefs							
Suicide ideation	4.16 (1.47)	4.15 (1.48)	4.43 (1.53)	1.55	19.06*** ^{SR}	4.85*	NA
Suicide attempt	2.85 (1.1.6)	2.81 (1.14)	2.93 (1.17)	.14	8.13** ^{SR}	10.80***	NA
Suicide	2.18(1.16)	2.13 (1.06)	2.31 (1.34)	.91	6.20** ^{SR}	21.33***	NA
Link depress/suicide	2.98 (1.17)	2.83 (1.22)	2.88 (1.05)	1.05	.59	.41	R × S*
Coping attitudes							
Help seeking	2.48 (.74)	2.52 (.77)	2.50 (.65)	1.37 ^{SR}	13.83*** ^{SR}	.33	G × R* ^{SR} , R × S*
Maladaptive	.20 (.18)	.17 (.16)	.18 (.18)	2.94*	15.14*** ^{SR}	2.13	R × S ^T
Concern/distress	1.40(.73)	1.60 (.88)	1.46 (.88)	2.33 ^{TSR}	4.40*	.98	

Note. ME = main effect, G = Group, R = Risk (inclusive risk group – those endorsing depressive and suicidal symptoms), S = Sex, Depress = Depression. Significance levels *** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$, ^T $p \leq .10$. Significant findings and trends ($p \leq .001$ to $p \leq .10$) for the two-way ANOVAs with the more restricted Suicide attempt risk category are noted by ^{SR} on the table.

sible solution, if you are depressed it is a good idea to keep your feelings to yourself, drugs and alcohol are a good way to help someone who is depressed, people who talk about suicide won't commit it).

An additional item was used to evaluate if the PSAs resulted in feelings of concern and/or distress from participating in the procedures of this study. Participants rated their level of concern and/or distress on a five-point scale (*none to a lot*). For the participants who endorsed any concern (32%), their written narrative responses were coded for (a) concern for self (e.g., "I don't want it to happen to me," "I wonder if I have any of the symptoms of depression"), (b) concern for others (e.g., "I worry about people in my school"), and (c) general perceptions of severity of the topic (e.g., "It's a scary topic," "Just knowing how serious it can be is a little concerning") with interrater reliability yielding a κ of .89.

Analytic Plan

A series of three-way ANOVAs were the primary analyses used: Group (three levels: billboard, TV ad, and no information) × Risk (two levels: low vs. high risk for depressive symptoms based on the more inclusive risk classification) × Gender (two levels, male vs. females). Tukey's post-hoc test was used to evaluate Group differences. Since the focus of this study was to determine if exposure to a PSA resulted in a potential benefit or risk to the viewer, the analyses that yielded Group main effects and interactions of

central significance are primarily reported in the text (see also Table 1 for a summary of the main effects and interactions). Noted in Table 1 are the results of a series of supplemental two-way ANOVAs we conducted with the more restrictive risk group who endorsed suicide attempt (SR = suicide risk). As most of the findings closely parallel the results of the less restrictive risk classification (e.g., suicide ideation) only the findings that pertain to the Group and Group by Risk interactions will be reported in the text.

Results

Perceived Utility of PSAs

For overall perceptive utility of PSAs, there was a significant main effect for Group. There was a post hoc trend ($p \leq .10$) for participants in the no-information condition to rate PSAs as more useful than the billboard condition. Second, there was a significant main effect for Group for perceived usefulness for a range of types of people (e.g., depressed person, suicidal person). The post hoc tests indicated that the participants in the TV-ad condition rated PSAs as useful for a wider range of people than those in the no-information condition ($p \leq .05$) or in the billboard condition ($p \leq .10$). Third, participants rated the type(s) of PSAs (e.g., billboards, TV ads, pamphlets) that would be useful. There was a significant interaction for Group by Sex. Males in the billboard condition rated more types of PSAs as useful than females (respectively, $M = 3.05$, $SD = 1.53$; $M = 2.57$,

$SD = 1.53$), males and females in the no-information condition had comparable ratings (respectively, $M = 2.94$, $SD = 1.64$; $M = 2.96$, $SD = 1.54$), and males in the TV-ad condition rated fewer types of PSAs as useful than females (respectively, $M = 2.51$, $SD = 1.66$; $M = 3.07$, $SD = 1.39$).

Knowledge About Depression

Despite a ceiling effect, the results yielded a significant main effect for Group, with post hoc analyses yielding a trend for participants in the TV-ad condition to endorse a higher percentage of correct symptoms than those in the no-information condition. There was a significant interaction for Group by Sex. Although females were more knowledgeable about depression than males (main effect of Sex), those most knowledgeable about symptoms of depression were males in the TV-ad and the billboard conditions (males in the TV ad: $M = .86$, $SD = .16$; billboard: $M = .87$, $SD = .18$; and no information: $M = .80$, $SD = .20$) and females in the TV-ad condition (females in the TV ad: $M = .94$, $SD = .09$; no information: $M = .92$, $SD = .12$; billboard: $M = .91$, $SD = .12$).

Normative Beliefs

With regard to estimates of suicidal thoughts and behaviors in their peers, there were no main effects or interactions for Group. However, as shown on Table 1, females estimated higher rates of suicidal risk than males, and high-risk participants estimated higher rates of suicidal risk than low-risk participants. There was no main effect for Group or interactions for Group with regard to the perceived link between depression and suicide.

Coping Attitudes

The findings from the help-seeking scale resulted in a main effect for Risk with low-risk participants ($M = 2.59$, $SD = .67$) endorsing help-seeking attitudes more strongly than high-risk participants ($M = 2.20$, $SD = .82$). This main effect was modified by a Group by Risk interaction. As shown in Figure 1, low- and high-risk participants in the no-information condition were more comparable (low risk: $M = 2.52$, $SD = .63$; high risk: $M = 2.45$, $SD = .71$), but in the billboard condition (low risk: $M = 2.60$, $SD = .68$; $M = 2.05$, $SD = .80$, respectively) and in the TV-ad condition ($M = 2.63$, $SD = .70$; $M = 2.15$, $SD = .91$, respectively) high-risk participants were less likely to endorse help-seeking attitudes. Considering the more restricted risk classification yielded a trend for a main effect for Group, $F = (2) 2.36$, $p \leq .10$, and for a Group by Suicide Risk interaction, $F = (2) 2.75$, $p \leq .10$.

The findings from the maladaptive-coping scale resulted in a significant main effect for Group. Although post hoc

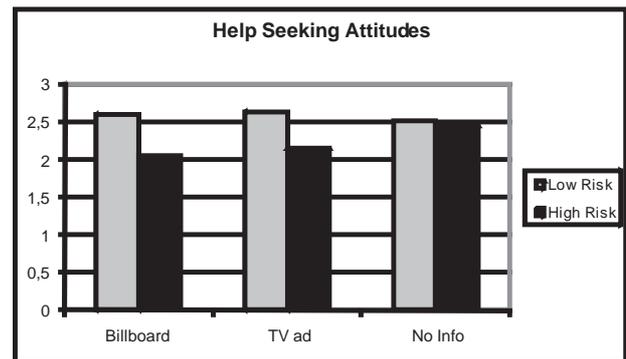


Figure 1. Help-seeking attitudes of adolescents: Group (billboard, TV ad, no information) by Risk (high vs. low) Interaction.

analyses were not significant, the trends ($p \leq .10$) indicated that the participants in the billboard condition endorsed higher levels of maladaptive coping than those in the TV-ad condition.

Concern and Distress

Approximately one third of the participants indicated that they received information that caused them concern and/or distress. There was a trend for a main effect for Group, $F = (1) 2.52$, $p \leq .10$. The coded participant narrative response failed to suggest evidence of an untoward effect. That is, there were no Group differences for concern for self. There were, however, Group differences for concern for others, $\chi^2 = 8.80$, $p \leq .01$ (46% for the billboard, 48% for the TV ad, and 13% for the no-information condition), and for perceptions of severity of the topic, $\chi^2 = 5.47$, $p \leq .10$ (39% for billboards, 32% for TV ads, and 60% for no-information condition).

Discussion

Determining optimal methods for preventing suicide in adolescents continues to be an elusive goal (e.g., Chambers et al., 2005; Gould, Greenberg et al., 2003). While increasing efforts have been made to use PSAs to heighten awareness about the topic of suicide, the work needed to empirically validate such approaches have been largely absent despite growing evidence that some suicide prevention efforts may have untoward effects (Gould, Greenberg et al., 2003; Velting & Gould, 1997). This is the first study we are aware of that has evaluated possible benefits and untoward effects for adolescents of two simulated PSA messages.

This study provides some evidence in support of PSAs as a useful means of educating adolescents about depression and suicide. While not without some potential risks (the TV ad was associated with decreased help seeking

in high-risk adolescents) the simulated TV ad appears to meet a central goal of suicide prevention efforts by increasing knowledge about depression and suicide. For example, after viewing this TV ad, adolescents were more knowledgeable about the symptoms of depression than their counterparts. The simulated TV ad impressed participants as a useful approach to suicide prevention, even for those currently thinking about suicide. Although some adolescents (e.g., high-risk adolescents in the billboard condition) endorsed a fair amount of maladaptive coping, adolescents having viewed the TV ad tended not to endorse maladaptive-coping attitudes. Indeed, while TV-ad viewers reported more concern/distress, these responses were largely directed at the welfare of others and may help those adolescents take necessary action when they see others in need. Perhaps the message in the TV ad was complete enough to provide some of the essential information about depression while simultaneously presenting information in a manner that did not alienate these adolescents. In contrast, the simulated billboard was largely without benefits for adolescent viewers (one exception was that males in the billboard condition rated more types of PSAs as useful, such as TV ads and pamphlets).

The results of this study raise some serious concerns about possible untoward effects of PSAs. One of the main goals of suicide prevention efforts is to reduce the stigma around help seeking. Efforts are commonly directed at promoting the belief that it is important to seek help from others, in this case "see your doctor." Even so, the results of this study suggest that attitudes toward help-seeking were less favorable for high-risk adolescents who viewed a PSA. These findings pertained to adolescents experiencing depressive symptoms as well as those with a history of attempting suicide. Perhaps the results would have differed if the adolescent had been urged to contact another source (e.g., school counselor, internet). Several other studies have similarly noted no program benefits on help-seeking attitudes (e.g., Aseltine et al., 2007; Shaffer et al., 1991). While this study focused on help-seeking attitudes, there are also challenges in evaluating help-seeking behavior. Several studies have noted an increase in calls to prevention centers and hospital admissions after media campaigns (Dyck et al., 1993 and Daigle et al., 1998; reported in Daigle et al., 2006). Similarly, research on adolescents has noted increased use of school counselors in the months following a suicide-prevention curriculum (Aseltine, 2003; Ross, 1980). While some may argue that the goals of the prevention efforts were met in that more people were seeking help, others might argue that exposure to the campaign stimulated suicidal thoughts and, accordingly, necessitated the need for additional contacts. More work is needed to ensure that those in need receive mental health evaluation and treatment.

The billboard not only elicited some untoward effects regarding attitudes toward help-seeking, but there is also

some concern that adolescents may respond adversely to billboard messages that are intended to help. After viewing the billboard, adolescents were less likely to endorse prevention efforts as useful and reported more maladaptive-coping attitudes. We are only able to speculate about explanations for this response. It is possible that adolescents were responding to the adult male pictured in the billboard as an authority figure. Alternatively, adolescents may have reacted adversely to this billboard because they perceive the solution to suicide prevention as being more complex. Perhaps they felt affronted by the simplicity of the message (e.g., "prevent suicide, treat depression"), perceiving the message as undermining their own experiences of pain and prevailing despair. Alternative approaches should be evaluated to determine what features of the billboard resulted in these untoward effects and to further evaluate if billboards can be an effective means of suicide prevention with adolescents.

Some of the concerns raised about possible untoward effects of PSAs were *not* supported in this study. Normative perceptions were not influenced by participants who viewed a PSA, nor was there evidence that the link between depression and suicide was overemphasized to participants who viewed a PSA. Yet, real-world exposure to PSAs may be repeated (e.g., a person may drive pass a billboard every day on his way to school). Also, adolescents may have seen these adult-featured PSAs as minimally relevant to themselves or their age-mates. Future efforts should consider if normative beliefs would be altered as a result of repeated exposure to PSAs and for campaigns directly targeting youth.

Finally, we explored if the risk status or the sex of the adolescent influenced the results. Like Gould et al. (2004), our findings suggest that, in comparison to healthy participants, participants with depressive and suicidal symptoms perceived PSAs as being less useful, overestimated depressive symptoms and the incidence of suicidal thoughts and behaviors, and endorsed more maladaptive coping and less help-seeking coping. Adolescent females were more likely than adolescent males to endorse experiencing depressive symptoms, were more knowledgeable about the symptoms of depression, and tended to overestimate the incidence of suicidality in their peers. Finally, some of the Risk by Sex interactions (e.g., coping) lead us to conclude that healthy female adolescents may profit most by these campaigns. Similarly, others have found that female adolescents are more likely than adolescent males to benefit from a suicide-prevention curriculum (Overholser, Hemstreet, Spirito, & Vyse, 1989). A suicide curriculum was rated by females as more acceptable, less intrusive, and less time demanding than males (Eckert, Miller, Riley-Tillman, & DuPaul, 2006).

Future efforts are needed to address some of the limitations of the current study. First, this study represents one small step in evaluating suicide-prevention messages and modalities using a simulation design. Because the

message and modality are confounded, it is not possible to determine if it is the characteristics of the message or the modality that account for the untoward effects. Nor are we able to determine if these results would generalize to real-world exposure. Second, the results of this study are based on posttest administration of the Suicide Awareness Questionnaire. Randomization within classes provides considerable confidence of equivalence and that the simulated PSAs influenced the adolescent participants' perceptions, knowledge, and attitudes. Yet, we did not assess changes in these constructs from pre- to post-test. Third, limited evidence of reliability and validity are available for some of the constructs assessed. The central findings are based on validated scales (e.g., help-seeking). However, some constructs relied on single item scales (including the depressive symptom screening). Although comparably brief depression screening measures have been used in past research and yielded adequate levels of sensitivity (Whooley, Avins, Miranda, & Browner, 1997), controversies about the utility of screening measures are ongoing (Gilbody, Sheldon, & House, 2008). Fourth, these findings may not generalize to other populations. Although the incidence of depression and suicide are well represented, we know little about how adolescents from other social classes and ethnic groups might respond to these PSAs.

In conclusion, it is important to note that in this study we did *not* test whether exposure to these simulated PSAs made adolescents more likely to consider suicide, nor can these findings attest to the influence of all posted billboards or TV ads. However, the results of this study do suggest that some PSAs (e.g., this billboard) may have limited benefits and some untoward effects for adolescents, particularly those exhibiting depressive and suicidal symptoms. Recently some have called for increased caution stating, "Until there is clear evidence that public health messages about suicide prevent, and do not normalize, suicide, and have no deleterious effects, the most prudent approach to this issue is not to include public health messages as part of a suicide prevention strategy" (p. 7; Beautrais et al., 2007). It is incumbent on preventionists to consider how these findings might be informative in guiding the development of universal prevention efforts in the future. Since it is not likely that universal approaches will prove effective as a sole means of suicide prevention, efforts should also include a broader range of strategies including gatekeeper training, physician education and means restriction (Mann et al., 2005). This investigation highlights the need for more research so that well-intended efforts to prevent suicide can serve the desired goals.

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Suicide Awareness Voices of Education is one of the leading, not-for-profit organizations in the United States with staff dedicated to preventing suicide. The work conducted by this organization is based on the foundation and belief that suicide should no longer be considered a hidden or taboo topic, and that by raising awareness and educating the public we can SAVE lives.

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