<u>A BRIEF PEER GATEKEEPER SUICIDE PREVENTION TRAINING:</u>
<u>PRELIMINARY EXAMINATION AND INDIVIDUAL FACTORS THAT</u>
<u>INFLUENCE OUTCOMES</u>

by

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A Dissertation
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A Brief Peer Gatekeeper Suicide Prevention Training: Preliminary Examination and Individual Factors that Influence Outcomes

A Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at George Mason University

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DEDICATION

This is dedicated to my mother, Dr. Sharon Rallis, and aunt, Dr. Mary Louise Van Winkle, who have always inspired me to follow my dreams.

ACKNOWLEDGEMENTS

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ABSTRACT

A BRIEF PEER GATEKEEPER SUICIDE PREVENTION TRAINING: PRELIMINARY EXAMINATION AND INDIVIDUAL FACTORS THAT INFLUENCE OUTCOMES

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Suicide is the second leading cause of death among college students. Despite the availability of mental health resources on college campuses, less than half of college students who are contemplating suicide seek professional help. Suicidal students are more likely to reach out to their peers for help but peers are generally not equipped with the skills needed to provide appropriate assistance. Thus, training students to serve as peer gatekeepers (i.e., recognize suicide warning signs, appropriately respond to concerns, refer suicidal youth to appropriate care) in suicide prevention efforts on college campuses holds great promise. The purpose of this dissertation project, funded by the GMU Center for the Advancement of Well-Being, was to: test the preliminary efficacy of a brief peer suicide gatekeeper training program (Mason Cares) through a joint collaboration between the Psychology Department and Counseling and Psychological Services (Aim1); and examine characteristics that predict effective peer gatekeeping behavior (Aim 2).

To address the first study aim, we examined whether a 1-hour version of the Mason Cares suicide gatekeeper training program offered to the general college student population, was associated with increases in suicide prevention knowledge (declarative and perceived) and referral of suicidal peers for help. Two hundred thirty-one college students (ages 18-48, M_{age}=20.7, SD=0.7; 65.4% female, 34.6% male; 56.7% Caucasian, 21.6% Asian, 11.7% Black/African American, 10% other/mixed race; 14.7% Hispanic, 85.3% non-hispanic) completed the Mason Cares suicide gatekeeper training. Results of paired sample t-tests revealed that the 1-hour peer gatekeeper training was associated with significant increases in student declarative and perceived knowledge of suicide prevention strategies as well as self-reported referrals of suicidal students over the course of three months. Being female predicted increase in perceived knowledge. Socio-demographic variables did not influence other outcomes, suggesting that the training program was generally effective for students of different ages, sex, and race.

To address the second aim, we examined whether a prominent model of leader attributes and performance (Zaccaro, Kemp, & Bader, 2004) could be used to predict effective peer gatekeeping behavior. According to this model, cognitive abilities, prosocial personality characteristics, and leadership driven motives for performance, increase the likelihood of developing leadership traits (i.e., social appraisal skills, problem-solving skills, expertise), which in turn, contribute to effective leadership behavior. Based on this model, we hypothesized that strong cognitive ability (i.e., higher GPA and SAT scores), positive/prosocial personality traits (i.e., extraversion, conscientiousness), and intrinsic motivation to help/support others, would be associated with stronger peer gatekeeper

leadership traits (i.e., emotional intelligence, social-problem solving skills, knowledge acquisition), which in turn, would predict effective peer gatekeeping behavior (i.e., identification/referral of suicidal students for professional help). The study sample was the same as that specified under Aim 1. The model was tested using structural equation modeling. Study results failed to offer support for the hypothesized model. These results suggest that the Zaccaro et al. (2004) model of leader attributes and performance, as operationalized in the present study, does not predict effective peer gatekeeping behavior in the area of suicide prevention.

A BRIEF PEER GATEKEEPER SUICIDE PREVENTION TRAINING: RESULTS OF AN OPEN PILOT TRIAL

Suicide is currently the second leading cause of death among college students (Turner, Leno, & Keller, 2013). According to data collected from college counseling center directors representing 275 colleges across the United States, 125 college students died by suicide in 2014 (Gallagher, 2014). Other research suggests that up to 48% of college students report thoughts of death (i.e., wish they were dead) and 6% seriously consider attempting suicide over the course of one year (Drum, Brownson, Burton Denmark, & Smith, 2009). Moreover, of those students who consider killing themselves, 69% report repeatedly thinking about killing themselves and 14% attempt suicide (Drum et al., 2009). Given the high prevalence of suicides and suicidal behavior among college students, research on effective suicide prevention strategies on college campuses is extremely important.

Although a significant number of students on college campuses contemplate suicide, less than half of these students seek professional help (Drum et al., 2009). The failure to seek services can prove fatal; 80 to 90% of college students who die by suicide did not seek services at their college's counseling center (Gallagher, 2014; Kisch, Leino, & Silverman, 2005). The underutilization of these resources by students who need them most may result from several causes, including lack of knowledge of available resources, fear of being judged by peers for seeking mental health services, and concern about

potential negative consequences resulting from disclosure (i.e., expulsion from school, forced hospitalization; Cook, 2007; Drum et al., 2009; Westfeld et al., 2005). The failure to seek professional help when needed is extremely unfortunate given that treatment often reduces the likelihood that students will act on their thoughts of suicide (Drum et al., 2009). Therefore, in their efforts to prevent suicide, colleges face the challenge of finding methods for empowering suicidal students to seek help at college counseling centers before they make a suicide attempt.

Gatekeeper trainings on college campuses are designed for individuals who come in regular contact with students (e.g., resident assistants, administrators, faculty, staff). They have become one of the most popular approaches to suicide prevention for college students (Goldston et al., 2010). They are also commonly administered in secondary schools and medical settings. Gatekeepers are trained to recognize suicide warning signs and signs of crisis among individuals and, most importantly, to refer at-risk individuals for treatment (CDC, 1992; Cross, Matthieu, Lezine, & Knox, 2010). The most commonly administered gatekeeper training programs include Question, Persuade, Refer (QPR; 1-2 hours; Quinnett, 1995; Quinnett, 2007), the Applied Suicide Intervention Skills (ASIST; 14 hour training; Living Works, Inc.; Rodgers, 2010), SafeTALK (3-8 hour training; Living Works, Inc.), and Campus Connect (3 hour training; Pasco, Wallack, Sartin, & Dayton, 2012).

Gatekeeper training programs focused on educating peers may be particularly helpful for college students. As thoughts of suicide increase, college students are more likely to conceal their negative emotions (Stewart, 2008) and suicidal thoughts (Drum et

al. 2009) from adults. College students' apparent reluctance to seek support from adults

in authority positions when they are in crisis corresponds with developmental theory.

Specifically, as adolescents move toward autonomy, they rely less on adults, such as

parents and professionals (Muuss, 1995), for advice and support. During this transition,

adolescents increasingly turn to peers for support (Gould, Greenberg, Velting, & Shaffer,

2003; Kalafat & Elias, 1995; Kalafat & Elias, 1994; Lewis & Lewis, 1996; Wyman et al.,

2008). Indeed, college students, especially those at risk for suicide (Cross, 2007; Drum et

al., 2009; Wyman et al., 2008), tend to seek support from their peers and report this

support to be helpful (Biro, Roza, & Kosa, 2011). However, peers are often not equipped

with the skills needed to offer support most effectively and may not refer suicidal peers

for professional help. Thus, peer gatekeeper training programs hold great promise in

suicide prevention efforts in educational settings. Below we review research that

examines the degree to which gatekeeper training programs improve suicide-related

knowledge, identification of suicidal individuals, and referral of suicidal individuals for

help. We also discuss socio-demographic factors (i.e., gender, age, race, ethnicity) that

may influence training outcomes.

Suicide-related knowledge

Studies with and without control groups have demonstrated significant

improvements in *declarative* (i.e., objective tests) and *perceived* (i.e., subjective

perception; self-evaluation) suicide knowledge, such as suicide warning signs, myths, and

intervention behaviors, among individuals who complete gatekeeper trainings across both

school and medical settings (e.g., secondary schools, colleges, hospitals) (Cimini et al.,

2014; Cross et al., 2010; Cross et al., 2011; Cross et al., 2007; Goldsmith, Pellmar, Klienman, & Bunney, 2002; Grossman & Kruesi, 2000; Jacobson, Osteen, Sharpe, & Pastoor, 2012; Keller et al., 2009; Matthieu, Cross, Batres, Flora, & Knox, 2008; Sharpe, Frey, Osteen, & Bernes, 2014; Taube et al., 2013; Tompkins & Witt, 2009; Tompkins, Witt, & Abraibesh, 2009; Wyman et al., 2008; 2010). In college settings specifically, Cross and colleagues (2010) found a significant increase in declarative knowledge and perceived knowledge from pre- to post-training among resident assistants, faculty, facilities workers, student affairs staff, and coaches across five universities in the United States after completing a 1-hour gatekeeper training. Cimini and colleagues (2014) found a similar increase in declarative knowledge and self-reported comfort in talking about suicide from pre- to post-training, among university faculty/staff and students in leadership/educator positions (i.e., resident assistants, peer educators, leaders of university service organizations) after they completed a tailored audience specific 1.5 hour, small-group interactive gatekeeper training program. Tompkins and Witt (2009) also found an increase in declarative knowledge and perceived knowledge of intervention behaviors from pre- to post-training among resident assistants who completed a 1-hour gatekeeper program. Finally, in a large study conducted with mixed groups of college faculty, staff, and students, Indelicato, Mirsu-Paun, and Griffin (2011) found that participant's perceived suicide knowledge in multiple areas (i.e., facts, skills, warning signs, information about local resources, how to persuade someone to seek help) increased from pre- to post training following a 1-2 hour gatekeeper training. Interestingly, some of these studies found a decline in declarative but not perceived

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knowledge at longer follow-ups (3-5 months post-training; Cimini et al., 2014; Tompkins & Witt, 2009), suggesting that booster sessions may be necessary to optimally retain declarative suicide knowledge.

Identifications of at-risk individuals

Relatively fewer studies have examined the impact of gatekeeper trainings on *actual* identification of individuals in crisis. Research conducted in secondary schools suggests that gatekeeper trainings are effective at increasing direct questioning about suicide and in facilitating identification of individuals who may have engaged in or are at risk for suicidal behaviors (Condron et al., 2015; Rodi et al., 2012; Wyman et al., 2008; 2010). For example, one study found that staff members who completed gatekeeper training reported asking more students about suicide from pre- to post-training (one more student per every four trained staff members; Wyman et al., 2008). Similarly, peers trained as gatekeepers in secondary schools were found to be more effective at identifying fellow students in crisis than those who were not trained in a second study (Wyman et al., 2010).

Research into the effects of gatekeeper trainings on the identification of college students at risk for suicide is more limited. Using a small group based gatekeeper training program, Cimini and colleagues (2014) found that 19% of faculty, staff, and student leaders/educators who completed the training reported talking to at-risk students about suicidal thoughts and behaviors at 3-month follow-up. Notably, they did not assess pre-training rates and their retention rates at 3-month follow-up were very low (11%). Lipson, Speer, Brunwasser, Hahn, & Eisenberg (2014) conducted a large randomized

controlled trial of a gatekeeper program across 32 universities and colleges that focused on educating resident assistants to identify and refer college students for *general* mental health concerns, including suicide. They found that participation in the training improved resident assistants' perceptions of their ability to identify students in distress, but there was no difference found in number of resident assistants who initiated contacts around mental health issues between those who did and did not complete the gatekeeper training. To our knowledge, no studies to date have examined the effect of suicide prevention gatekeeper training on *changes* in identification rates of suicidal students, in particular, on college campuses.

Impact of training on referrals

Most of the studies that have examined the impact of gatekeeper trainings on referrals of at-risk individuals were conducted in secondary schools. Generally, these studies suggest that gatekeeper trainings increase the number of referrals of at-risk students for professional help (Condron et al., 2015; Rodi et al., 2012; Wyman et al., 2010). For example, one study found that the odds of a peer referring a fellow student in crisis was 4.12 times greater in schools where students completed gatekeeper training relative to schools without this training (Wyman et al., 2010). Similarly, adults trained as gatekeepers in secondary schools were also found to be more likely than untrained school personnel to refer suicidal students to mental healthcare services (Rodi et al., 2012).

Few studies have examined the impact of gatekeeper training on student referrals on college campuses, and those that have yielded mixed results. Cross et al. (2010) found a significant increase in one's *ability* to make an adequate referral (demonstrated via role

plays during a gatekeeper training) from pre- to post training (10% to 54%) among university resident assistants, faculty, and staff. However, two studies did not find increases in self-reported referral behavior after completion of gatekeeper training. Tompkins and Witt (2009) did not find a significant change in a composite measure of referral behaviors (i.e., asking about suicidal thoughts, listening, providing information, convincing student to seek help, taking student to a counselor, notifying of referral resources) among trained resident assistants between pre-training and 5-month follow-up. Similarly, Lipson and colleagues (2014) failed to find a difference in rates of general mental health referrals between resident assistants who did and did not complete a mental health gatekeeper training (that included but was not limited to suicide) 2-3 months post-training. Studies have yet to examine the effects of suicide specific gatekeeper training programs on independent referral rates of college students at risk for suicide to mental healthcare professionals.

Generalizability of training effects

While gatekeeper trainings are generally designed to increase suicide prevention knowledge and skills among *anyone* likely to come in contact with a suicidal student (Goldston et al., 2010), socio-demographic differences may influence outcomes. Students of different ages and cultural backgrounds may be more receptive to information relayed through the training and more likely to actively refer suicidal students to mental healthcare resources. To our knowledge, only one study has investigated whether socio-demographic variables influence gatekeeper training outcomes on a college campus. Indelicato and colleagues (2011) found that those who are female (relative to male) and

hold faculty/staff positions (relative to students) (i.e., older adults vs. young adults) showed greater increases in perceived suicide knowledge following gatekeeper training. These findings are consistent with research which suggests that male college students (relative to female students) are more reluctant to discuss mental health concerns (Davies et al., 2000). Similarly, older adults report more positive attitudes towards help-seeking than younger adults (Berger, Levant, McMillan, Kelleher, & Sellers, 2005; Robb, Haley, Becker, Polivka, & Chwa, 2003; Sirey et al., 2001). Comfort discussing mental health concerns and attitudes toward mental health seeking could undoubtedly influence uptake and application of skills learned during gatekeeper training.

Interestingly, no research to date has explored the effect of other socio-demographic variables, such as race and ethnicity, on outcomes of gatekeeper training programs. Cultural norms in African American, Asian, and Hispanic communities discourage treatment seeking (Chu, Hsieh, & Tokars, 2011; Goldston et al., 2008). They also foster a tendency to ignore mental health symptoms (Hines-Martin et al., 2003; Gallo et al., 2005), even when they are extremely severe (Hines-Martin et al., 2003; Davis et al., 2008). Such cultural norms may act as barriers to a student's ability to acquire or apply knowledge from gatekeeper training. Accordingly, African American, Asian, and Hispanic students may be less likely to gain as much knowledge or refer as many suicidal students for help relative to students from other racial and ethnic backgrounds.

As suggested above, training peers as gatekeepers represents a potentially effective method of suicide prevention in academic settings, given that suicidal students are more easily identified by and more likely to report suicidal thoughts to peers (Cross,

2007; Drum et al., 2009; Wyman et al., 2008; 2010). Moreover, in secondary school settings, peer gatekeeper trainings have been shown to improve suicide-related knowledge, identification, and referral rates. Though suicide specific gatekeeper trainings on college campuses have been associated with improvements in suicide-related knowledge, no studies have specifically examined the effect on identification or referrals rates of at-risk college students. Given significant developmental differences (e.g., growing self-identity, greater autonomy, increased reliance on peers for support; Muuss, 1995) between secondary school and college aged students, it is important to examine whether positive results can be replicated in college samples. Also notable is that studies that have been conducted on college campuses trained students in leadership/educator roles as gatekeepers. No studies have explored whether similar results can be achieved when training students solely from the general college population as gatekeepers.

The present study addresses gaps in this literature by examining the effects of a 1-hour peer gatekeeper suicide prevention training on suicide-related knowledge, student identification, and student referrals rates between pre-training and follow-up (post-training and 3 months). Students from the general college population were trained as gatekeepers as opposed to those in leadership/educator positions. Further, this gatekeeper training was intentionally designed to be brief to improve ease of delivery, lower training costs, and optimize student acceptability of training. It was hypothesized that our 1-hour peer gatekeeper suicide prevention training would be associated with improvements in declarative and perceived suicide-related knowledge, rates of identification of suicidal peers, and rates of referral of suicidal peers to a mental health professional. We also

explored whether student socio-demographic background (gender, age, race, ethnicity) influenced study outcomes. It was hypothesized that being female (versus male), older (versus younger), Caucasian (versus African American or Asian), and Non-Hispanic (versus Hispanic) would predict greater improvement in suicide related knowledge and referrals of suicidal students to mental healthcare.

Methods

Participants

Participants included 231 university students (ages 16-48), recruited from a diverse campus of over 20,000 undergraduate students. The university population is 49% White, 14% Asian, 10% Hispanic Latino, 9% Black/African American, 3.5% Bi-racial, 3% Native Hawaiian/Pacific Islander, and 1% Native American/Alaska Native. The university is largely a commuter school with only 18% of students living on campus. Participants were included if they: 1) were older than 18 years of age; 2) had not completed a gatekeeper training before; and 3) were proficient in English. See Table 1 for socio-demographics of the study sample.

Procedure

Participants were recruited through an online university system (SONA) that posts studies that students can take part in to earn research participation credits for psychology courses as well as in-person recruitment in the broader University community (i.e., presented study during group meetings at fraternities, sororities, clubs). All participants provided informed consent and remotely filled out a 1-hour online baseline assessment prior to attending an in-person 1-hour gatekeeper training on campus. Five master's level

clinical psychology doctoral students, trained in the manualized gatekeeper protocol, facilitated the gatekeeper trainings (see below for details of the protocol). Training of these trainers was conducted in a four-hour workshop, delivered by the University counseling center staff member who developed the gatekeeper training program, via didactic presentations and role-plays.

Immediately after the trainers delivered the gatekeeper training to college student participants, participants filled out a 15-minute post-training knowledge assessment (i.e., the same knowledge assessment administered at baseline) via paper and pencil at the training location. Students either received 3 hours of research credit (those recruited through SONA) or $12 in cash (those recruited in the college community) for completing baseline assessment, the training, and pre-post knowledge assessments. After the training, a research assistant provided participants with a range of dates to choose from for their 3-month follow-up assessment. When participants were due for their 3-month follow-up, a reminder e-mail, phone call, or text message was sent to them with instructions for filling out the assessment remotely, from their personal computers. The 3-month follow-up assessment took approximately 30 minutes to complete and participants received $20 upon completion.

Suicide Prevention Gatekeeper Training. The 1-hour manualized gatekeeper training, developed by staff in the on-campus university counseling center, was modeled after the well- established Question, Persuade, Respond (QPR) training. This training focused on teaching participants to: recognize the signs of distress in peers, ask directly about suicidal thoughts, and follow university referral system guidelines to ensure at-risk

students are connected to professional help. The didactic portion of the training was approximately 45 minutes and was followed by a 15-minute block during which participants paired off to practice communication and referral skills through role-plays. Participants based their role-play on a case example of a college student who demonstrated warning signs of suicide. In addition, participants were provided with a manual to keep that contained psycho-education on suicide (i.e., college suicide statistics and facts, reasons why college students attempt suicide, myths and facts related to suicide), a conversation guide (i.e., how to ask peers about suicide, how to listen and respond to peers in crisis), and a referral guide (i.e., procedures and contacts).

Measures

Demographics. Demographic information was gathered using a form that asked for participant age, sex, race, ethnicity, sexual orientation, military status, academic year, major, and participation in organizations or groups at the University.

Declarative Knowledge. Declarative knowledge was assessed with questions based on material presented in the 1-hour training program. The assessment of declarative knowledge required participants to respond to ten *true* or *false* statements that assess retention of suicide facts and prevention skills covered in the training. Scores could range from 0-10.

Perceived Knowledge. The perceived knowledge questionnaire, adapted from similar gatekeeper evaluation studies (Tompkins & Witt, 2009; Wyman et al., 2008), asked participants to self-evaluate their suicide awareness, comfort level talking to at-risk students, and perceived knowledge of suicide risk factors and prevention skills (e.g., "I

am aware of various risk factors associated with suicide"; "I understand the meaning of various suicide terms such as threat, attempt, survivor of suicide"; "I feel comfortable attempting to emotionally connect with students in crisis") on a scale from *0 "not at all true"* to *10 "very true"*. Scores could range from 0 to 140. The perceived knowledge assessment demonstrated acceptable reliability across administrations (pre-training, α= .94; post-training, α= .81; 3-month follow-up, α= .96).

    Identification and Referral. Identification of suicidal students was assessed with the question, "How many suicidal students have you identified in the last 3-months?". Referral of suicidal students was assessed with the question, "How many suicidal students have you referred for concerns related to suicide in the last 3-months?"

Results

Two-hundred thirty-one participants completed the baseline assessment, training, and post-training knowledge assessment. One hundred seventy-eight out of 231 participants (77%) were retained in the study from baseline to 3-month follow-up. The 53 participants who were not retained failed to respond to multiple attempts by study staff to contact them for the 3-month follow-up. Univariate statistics (chi-squares, independent sample t-tests) were conducted to determine whether there was a difference between participants who completed the 3-month follow-up versus those who did not on socio-demographic or study variables. No significant differences were found in age ($t = -.03$, $p = .98$), race [Black/African American, X^2 (1, N = 231) = .02, $p = .55$; White/Caucasian, X^2 (1, N = 231) = .19, $p = .39$; Asian, X^2 (1, $N = 231$) = .33, $p = .53$]; or ethnicity (Hispanic vs. Non-Hispanic), X^2 (1, N = 231) = .08, $p = .06$. However, more females (70.6%) than

males (29.4%) completed the 3-month follow-up (X^2 (1, N = 231) = 9.2, p = .002). No significant differences were found for change in perceived knowledge (t = .81, p = .42) or declarative knowledge (t = .43, p = .67) from pre to post-training or for baseline identifications (t = .12, p = .90) or baseline referrals (t =.24, p = .81) of suicidal students between participants who did and did not complete the 3-month follow-up.

Intercorrelations of main study variables (declarative knowledge, perceived knowledge, identifications, referrals) appear in Table 2. As expected, pre and post-training declarative knowledge were significantly correlated as were pre-and post-training perceived knowledge. A significant correlation was also found between baseline identifications and baseline referrals as well as follow-up identifications and follow-up referrals. Interestingly, pre-and post- training declarative knowledge were not significantly correlated with pre-and post- training perceived knowledge. However, declarative and perceived knowledge at 3-month follow-up were significantly correlated. Pre-and post-training declarative knowledge as well as pre-training perceived knowledge were significantly correlated with baseline referrals but not with 3-month follow-up referrals.

Main effects of training on declarative and perceived knowledge

A series of dependent sample t-tests were conducted to examine changes from baseline to end-of-training, and baseline to 3-month follow-up, on declarative and perceived knowledge. Given that eight t-tests were conducted, a Bonferroni correction was employed. An alpha level of .006 was used to test statistical significance for all dependent sample t-tests for main effects. As can be seen in Table 3, between baseline

and both follow-up periods (post-training and 3-months), participants reported a statistically significant increase in declarative and perceived knowledge, with large effect sizes. However, some decay of declarative and perceived knowledge occurred between post-training and 3-month follow-up ($t = -7.90$, $p < .006$ and $t = -3.99$, $p < .006$, respectively).

Main effects of training on identifications and referrals

A series of dependent sample t-tests were conducted to examine changes from baseline to 3-month follow-up on identification and referral of suicidal students. As noted above, an alpha level of .006 was used to denote statistical significance. As can be seen in Table 3, across baseline and 3-month follow-up, participants reported a statistically significant increase in referral of suicidal students (small effect) but not identification of suicidal students.

Socio-demographic predictors of outcome changes

A total of sixteen separate linear regressions were performed to determine whether gender, age, ethnicity (Hispanic vs. non-Hispanic), or race, predicted change in declarative or perceived knowledge from pre-training to post training, or change in referrals from pre-training to 3-month follow-up (see Tables 4, 5, and 6). Given that 16 regressions were conducted, a Bonferroni correction was employed. An alpha level of .004 was used to denote statistical significance.

Declarative Knowledge. Four separate linear regressions were performed to determine whether gender, age, ethnicity, or race predicted change in declarative knowledge from pre-training to post training (see Table 4). Pre-training declarative

knowledge was included as a covariate in each regression predicting change in declarative knowledge from pre-to post training. The results of the regression indicated that neither gender, age, ethnicity, or race significantly predicted change in declarative knowledge.

Perceived Knowledge. Four separate linear regressions were performed to determine whether gender, age, ethnicity, or race predicted change in perceived knowledge from pre- to post- training (see Table 5). Pre-training perceived knowledge was included as a covariate in each regression predicting change from pre-to post training perceived knowledge. As can be seen in Table 5, results suggested that gender explained a significant amount of the variance in change in perceived knowledge. Specifically, being female significantly predicted the increase in perceived knowledge from pre-to post training. Neither age, ethnicity, nor race, significantly predicted change in perceived knowledge.

Referrals. Four separate simple linear regressions were performed to determine whether gender, age, ethnicity, or race predicted change in referrals from baseline to 3-month follow-up (see Table 6). Number of pre-training referrals was included as a covariate in each regression predicting number of referrals at 3-month follow-up. When entered into separate regressions neither gender, age, ethnicity, or race, significantly predicted referrals.

Discussion

The benefits of suicide prevention gatekeeper trainings administered to teachers, administrators, staff, and peers are well documented in secondary schools. Less well

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studied is the effect of gatekeeper trainings on the college student population. To date, there is some evidence that gatekeeper trainings administered to faculty, staff and students in leadership/educator roles (e.g., resident assistant, peer educators) on college campuses are associated with increases in declarative and self-perceived knowledge about suicide (Cross et al., 2010, Taub et al., 2013; Tompkins & Witt, 2009) and the "ability" to make adequate referrals as demonstrated in role plays (Cimini et al., 2014). To our knowledge, the present study is the first to examine the effects of a peer based suicide prevention gatekeeper training administered to the general college population (as opposed to those in leadership/educator roles) on knowledge of suicide prevention skills as well as identification and referral of suicidal students. The training tested is also brief, which may improve ease of delivery, delivery costs, and willingness of students to be trained.

Consistent with study hypotheses, results of the present study suggest that a 1-hour peer gatekeeper training administered to students from the general college population was associated with significant increases in declarative and perceived knowledge of suicide facts and prevention strategies. The increase in perceived knowledge was particularly true for female students. In addition, the training resulted in an increase in self-reported referrals of suicidal students by peer gatekeepers 3-months after the training. The increase in self-reported referrals was generalizable across age, race, ethnicity, and gender of participants. These findings extend prior research to suggest that a brief gatekeeper training, administered to the general college population, can promote effective suicide prevention knowledge and skills.

Contrary to study hypotheses, though there was a significant increase in referrals of suicidal students, there was not an increase in identification of suicidal students from pre-training to 3-month follow-up. These results may suggest that college students were already actively identifying peers in crisis, though not necessarily referring them to a professional for help. Failure to refer identified students is unfortunate, given that evidence based treatment for suicidal ideation and behavior substantially decreases suicide risk (Brown et al., 2005). Therefore, including detailed information on how to refer suicidal peers for help and addressing associated obstacles (i.e., inaccurate beliefs about treatment, concern about betraying trust, etc.) in gatekeeper training programs is essential for effective suicide prevention.

Notably, study results suggest some decay in suicide related knowledge from post-training to 3-month follow-up. This is consistent with prior research that suggests that knowledge of suicide facts may deplete over time (Cimini et al., 2014; Tompkins & Witt, 2009). Despite this decay, participants still reported an increase in referrals over time. Thus, there may be a base level of knowledge needed, or memory of certain core components, to maintain gatekeeper willingness and ability to successfully refer suicidal peers for professional help. Nonetheless, adding booster sessions to help gatekeepers retain suicide related knowledge, may yield the most optimal outcomes.

Limitations

Though study findings are informative and novel, they should be interpreted within the context of several limitations. First, this study only included self-report measures. Future research should include an objective measure of referrals (i.e., change

in number of students who sought referrals at the college counseling center). Second, as is the case with most research in this area, the follow-up assessment period was rather brief (3 months) and thus may not have sufficiently captured the full effect of the intervention. Longer follow-up periods are recommended in future research. Third, though data were collected within a large diverse public university, inclusion of one academic institution limits the generalizability of study findings to other campuses. It will be important for future research in this area to examine gatekeeper training programs in the context of multi-site studies. Finally, the absence of the inclusion of a control group is another limitation. Thus, it cannot be definitively concluded that an increase in referrals of suicidal students to professionals was due to the gatekeeper training program. Use of a randomized controlled trial in future investigations is warranted. Despite these limitations, results of this study add uniquely to the literature on peer based suicide gatekeeper trainings.

Implications

Results of this study hold potential implications for suicide prevention efforts on college campuses. Targeting students from the general college population to be trained as peer gatekeepers may help to increase the likelihood that students in crisis receive an appropriate referral to professional help and, as a result, to save lives. The training tested appears to increase referrals but not identification of suicidal students. This suggests that students in the general population may already be capable of identifying suicidal students. Thus, more training time may need to be spent on following the appropriate referral system within the University to facilitate the student in crisis receiving help and

processing obstacles to making referrals during gatekeeper training. Further, given that some decay occurred in knowledge from post-training to 3-month follow-up, refresher trainings may be needed to optimize intervention effects.

LEADER QUALITIES AS PREDICTORS OF PEER GATEKEEPER EFFECTIVENESS

Suicide is currently the second leading cause of death among college students (Turner et al., 2013). According to data collected from college counseling center directors representing 275 colleges across the United States, 125 college students died by suicide in 2014 (Gallagher, 2014). Moreover, up to 48% of college students report thoughts of death (i.e., wish they were dead) and 6% seriously consider attempting suicide over one year (Drum et al., 2009). Moreover, of those students who consider killing themselves, 69% report repeatedly thinking about killing themselves and 14% attempt suicide (Drum et al., 2009). Given the high prevalence of suicides and suicidal behavior among college students, research on effective suicide prevention strategies on college campuses is extremely important.

Gatekeeper trainings on college campuses are designed for individuals who come in regular contact with students (i.e., resident assistants, administrators, faculty, staff). They have become one of the most popular approaches to suicide prevention for college students (Goldston et al., 2010). They are also commonly administered in secondary schools and medical settings. Gatekeepers are trained to recognize suicide warning signs and signs of crisis among individuals and, most importantly, to refer at-risk individuals for treatment (CDC, 1992; Cross et al., 2010). Gatekeeper trainings show promise in increasing declarative suicide knowledge (i.e., suicide warning signs and intervention

behaviors) and attitudes (i.e., beliefs about suicide, self-perceived knowledge and efficacy around suicide related topics) among participants across both school and medical settings (e.g., secondary schools, colleges, hospitals) (Cross et al., 2011; Cross et al., 2007; Goldsmith et al., 2002; Grossman & Kruesi, 2000; Jacobson et al., 2012; Keller et al., 2009; Matthieu et al., 2008; Sharpe, Frey, Osteen, & Bernes, 2014; Taube et al., 2013; Tompkins & Witt, 2009; Tompkins, Witt, & Abraibesh, 2009; Wyman et al., 2008). They have also been shown to increase identification and referral rates of suicidal secondary school students to mental health professionals (Condron et al., 2015; Rodi et al., 2012; Wyman et al., 2008; 2010). On college campuses, gatekeeper trainings have been shown to increase comfort communicating with suicidal students (Cimini et al. 2014) and the ability to make adequate referrals of suicidal students for help (Cross et al., 2010). While many studies have examined the efficacy of gatekeeper trainings in improving suicide knowledge as well as identification and referrals of suicidal individuals for help, fewer have investigated the personal attributes that contribute to gatekeeper effectiveness.

Most studies designed to examine factors that predict gatekeeper effectiveness have been conducted with employees in the work place (Moore, Cigularov, Chen, Martinez, & Hindman, 2011), staff at Veterans Administration hospitals (Matthieu et al., 2008), and staff and students in secondary schools (Wyman, 2008; 2010). Generally, these studies suggest that those who are younger (Tompkins et al., 2009), hold administrative positions (relative to support staff; Tompkins et al., 2009), have less clinical experience or knowledge about suicide prevention (Matthieu et al., 2008; Cross et

al., 2011; Tompkins et al., 2009, Wyman et al., 2010), have greater social support (Moore et al., 2001), and are in positions that facilitate communication with suicidal individuals (i.e., counseling staff and guidance counselors in secondary schools; Condron et al., 2015; Wyman et al., 2008) are most likely to report increases in declarative and/or perceived suicide knowledge after gatekeeper training. Additionally, other studies conducted in secondary schools found that staff and parents with previous exposure to suicide (prior contact with someone who was suicidal and participation in previous suicide prevention training; Cross et al., 2011), staff in mental healthcare positions (Condron et al., 2015), and peers who held the beliefs that *suicide is not a way to solve problems* and *adults can help suicidal students* were more likely to identify and refer suicidal teens to appropriate school staff for help after the gatekeeper training (Wyman et al., 2010).

Studies conducted to examine factors that predict gatekeeper effectiveness on college campuses with faculty, staff, and/or students in leadership positions show some overlap as well as unique results. Specifically, those who are female (Indelicato et al., 2011), hold faculty/staff positions (relative to students; Indelicato et al. 2011), and have not had any prior gatekeeper training (Taub et al., 2013) showed greater increases in declarative and/or perceived suicide knowledge following gatekeeper training. Additionally, one study found that faculty, staff and students in leadership/educator positions who reported more (versus less) comfort talking to students in crisis about suicide before engaging in gatekeeper training, were more likely to talk with students in crisis after the training (Cimini et al., 2014). Finally, Cross and colleagues (2010)

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examined the personality characteristic of *openness to experience* as a predictor of enhanced skills (i.e., ability to ask directly about suicidality, to be persuasive about getting assistance, and to provide a helpful referral). Interestingly, they found that greater *openness to experience* at baseline did not predict enhanced skills immediately after the training among faculty, staff, or student resident assistants. While these initial findings are important, theory driven research focused on the prediction of gatekeeper effectiveness may help to further improve knowledge in this area and facilitate optimal selection of students to train as gatekeepers when resources are limited.

Given that peer gatekeepers assume a "leadership" role in suicide prevention efforts on college campuses, use of leadership models may help inform our understanding and prediction of individuals who will serve as effective gatekeepers. Specifically, gatekeepers must motivate others to accomplish a specific goal (Vroom, 2007, p. 18), which in this case involves leading suicidal students to seek professional help. One leadership model that may be particularly relevant to predicting a gatekeeper's effectiveness (i.e., ability to retain knowledge acquired from the training, detect emotional distress in a suicidal student, and guide the suicidal student to professional help) is Zaccaro, Kemp, and Bader's (2004) *Model of Leader Attributes and Leader Performance.* This theory specifies a series of distal and proximal traits that underlie a leader's capability to recognize issues and respond appropriately (Kenny & Zaccaro, 1983) and, thus, to emerge as an effective leader. According to this model, an individual's broad distal leadership traits (i.e., positive personality traits, cognitive ability, motivation) influence the development of more specific proximal leadership traits

(i.e., social intelligence, problem-solving competencies, expertise, and tacit knowledge), which in turn, influence leadership processes and outcomes. The contribution of each predictor of leader effectiveness included in the model is hypothesized to vary based on context (i.e., leader's operating environment; Zaccaro & Klimoski, 2001).

Studies that have tested the Zaccaro et al. (2004) leadership model have yielded mixed results. A modified version of this model (i.e., sense-making was added to the proximal traits included in the model) failed to predict leader effectiveness among school principals (Young, 2010). However, Connelly and colleagues (2000) tested a similar model put forth by Mumford et al. (2000) and found that complex problem solving skills, social intelligence, and leader knowledge partially mediated the relationship between cognitive abilities, motivation, and personality, and leader achievement in a sample of commissioned Army Officers. Notably, this model includes individual traits and abilities that hold potential promise in predicting gatekeeper behavior among college students, including strong cognitive ability, positive personality traits (extraversion, conscientiousness), motivation, knowledge acquisition, social intelligence, and problem-solving skills. The purpose of the present study is to examine whether leadership and personality characteristics, drawn from the Zaccaro et al. (2004) model, predict peer gatekeeper success (i.e., identification and referral of suicidal students) in a college sample. Below research that supports the association between variables included in this model is reviewed.

Cognitive ability (intelligence), a broad mental capacity that involves the ability to understand and manage a series of complex ideas in order to solve problems (Schmidt

& Hunter, 2000), is the characteristic with the largest positive correlation with leadership emergence/effectiveness in a variety of populations (e.g., Zaccaro et al., 2004; Connelly et al., 2000; Lord, De Vader, & Alliger, 1986). It also predicts undergraduate academic success (Ferentinos, 1996; Judge, Colbert, & Ilies, 2004). In their role as leaders in the suicide prevention efforts on college campuses, peer gatekeepers must possess the mental capacity to gather, process, and retain information imparted to them in gatekeeper training. They must apply what they learned to identify suicidal individuals and connect them with appropriate mental health resources. These tasks require adequate cognitive ability for successful completion.

Personality traits, such as extraversion and conscientiousness, may also promote effective gatekeeper behavior. Prior research that examined traits included in the Big Five Factor Model of Personality (John & Srivastava, 1999; i.e., extraversion, agreeableness, conscientiousness, openness to experiences and neuroticism or emotional instability) found that extraversion exhibits the strongest relationship to leadership effectiveness, followed by conscientiousness (e.g., Judge, Bono, Ilies, & Gerhardt, 2002; Ng, Ang, & Chan, 2008). Judge and colleagues (2002) reviewed 78 studies and also found extraversion to be the most consistent correlate of leadership effectiveness across settings (i.e. business, government, military, primary and secondary schools). Extraverts enjoy engaging with others socially and are perceived as energetic and outgoing (Costa & McCrae, 1989). Similar to other types of leaders, peer gatekeepers also operate in a social context that requires social engagement (i.e., engaging a suicidal individual in crisis communication) for success.

Similar to extraversion, conscientiousness may also promote gatekeeper success. Conscientious individuals have actually been found to outperform extraverts in settings where leaders have greater autonomy (Ng et al., 2008). Conscientious individuals also are more likely to seek out job related trainings, complete assignments that enhance their job relevant knowledge and skills (Borman, White, Pulakos, & Oppler, 1991), and persist with a challenging problem in order to emerge as effective leaders. Conscientious peer gatekeepers may be more likely to acquire knowledge from gatekeeper training and use this knowledge to help suicidal students. Conscientiousness may be particularly important when a gatekeeper encounters ambiguity and has to make the decision about whether to persist in a conversation with a potentially at-risk individual to determine whether referral is necessary, or leave as is and assume that no services are needed. A conscientious gatekeeper may be more likely to persist in this task and make the most responsible and appropriate decision.

Gatekeepers' type and degree of motivation may also influence their behaviors. Zacarro and colleagues (2004) refer to motivation for "power" and "achievement" as a driving force behind effective leadership as opposed to intrinsic motivation. Consistent with this model, motivation for power and achievement are the types of motivation most commonly linked to leader effectiveness in the leadership literature (House, Spangler, & Woycke, 1999, Chan & Drasgrow, 2001; Deluga, 1998). However, the context of peer suicide prevention leadership is quite different than that examined in the aforementioned studies. A gatekeeper's choice to strive toward effective gatekeeping behavior may be driven more by the *intrinsic* desire to expend effort helping others (i.e., save lives).

Indeed, research suggests that the promise of connection with and service to community predicts high school students' willingness to contribute to and engage in leadership activities (Lizzio, Dempster, & Neumann, 2011).

Though potentially important to gatekeeper behavior, the pathway from cognitive ability, personality traits, and motivation, to effective gatekeeper behavior may not be direct. Indeed, prior leadership research suggests that these types of associations may be mediated by other individual attributes (Van Iddekinge, Ferris, & Hefner, 2009; Zaccaro et al., 2004) such as knowledge, problem-solving skills, and social intelligence (Borman, Hanson, Oppler, Pulakos, & White, 1993; Connelly et al., 2000; Mumford, Zaccaro, Harding, Jacobs, & Fleishman, 2000). Knowledge (i.e., recall and recognition of declarative facts and demonstration of procedural skills) plays an integral role in the connection between cognitive ability, personality traits, and motivation (Connelly et al., 2000; Zaccaro et al., 2004) and leader effectiveness. Cognitive ability, intrinsic motivation, and conscientiousness are well established predictors of knowledge acquisition and dissemination (Furnham & Chamorro-Premuzic, 2006; Lin, 2007; Martocchio, & Judge, 1997; Matzler, Renzl, Muller, Hertling, & Mooradian 2008; Rolfus & Ackerman, 1999).

With regard to social intelligence, emotional intelligence (i.e., ability to monitor one's own and other's feelings and emotions, discriminate among them, and use this to guide one's thinking and actions; Salovey & Mayer, 1990), a type social intelligence, has been associated with cognitive ability (Cote & Miners, 2006; Ono, Sachau, Deal, Englert & Taylor, 2011), positive personality traits (e.g., extraversion, conscientiousness; Ono et

al., 2011) as well as effective leadership behavior (e.g., Wong & Law, 2002; Higgs & Aitken, 2003). Although research has not investigated the potential association between intrinsic motivation (to help others) and social intelligence, literature supports a positive relationship between motivation to lead and social intelligence (Chan & Drasgrow, 2001).

Similarly, research suggests that strong problem-solving skills (i.e., the ability to define significant problems, gather information, formulate ideas, and construct prototype plans for solving the problem) heighten a leader's ability to perform tasks needed to lead effectively (Zaccaro, Mumford, Connelly, Marks, & Gilbert, 2000). Furthermore, according to Connelly et al. (2000), problem-solving skills partially mediate the pathway from cognitive ability, personality traits, and motivation, to leadership behavior. Others have also found problem- solving to be positively associated with cognitive ability (Borman et al., 1993; Connelly et al, 2000), personality traits (extraversion, conscientiousness; Chartrand, Rose, Elliott, Marmarosh & Caldwell, 1993; Elliott, Herrick, MacNair, Harkins, Elliott, & Shrout, 1992; Van Iddekinge et al., 2009; Zaccaro et al., 2000) and intrinsic motivation (e.g., MacKinnon, 1999; Song & Grabowski, 2006).

With regard to gatekeepers in particular, it stands to reason that cognitive abilities, personality traits, and motivation will influence knowledge acquisition, emotional intelligence, and problem-solving skills, as suggested in the literature above. For example, conscientious and extraverted gatekeepers may ask more questions to acquire knowledge in group trainings and participate more actively in the role-plays to further hone their social appraisal and problem-solving skills. Gatekeepers must use knowledge

acquired through gatekeeper training, as well emotional intelligence and problem solving skills, to process and understand the feeling, thoughts, and behaviors of their peers. They must then match their responses and decisions to best fit the contingencies and dynamics of the problem at hand (i.e., identifying a suicidal peer and guiding him/her to the appropriate professional help). Thus, a gatekeeper's success is dependent on the efficient and effective use of knowledge, emotional intelligence, and problem-solving skills.

In summary, the present study will examine whether the aforementioned leadership and personality characteristics, drawn from Zaccaro et al.'s (2004) prominent model of leader attributes and performance, predict peer gatekeeper success in a sample of college students from the general population trained as gatekeepers in peer suicide prevention. Based on the research presented above, it was hypothesized that peer gatekeepers with greater cognitive ability, positive personality traits (extraversion and conscientiousness), and intrinsic motivation, will demonstrate greater suicide knowledge acquisition, emotional intelligence, and problems-solving skills, which in turn, will predict more effective gatekeeper behavior (greater identification and referral of suicidal students for help). To provide a conservative test of this model, we also examined the potential influence of social connectedness and psychiatric symptoms on outcomes (i.e., identification and referral of suicidal students). Socially connected young adults have wider social networks (e.g., Whitlock, Wyman, Moore, 2014) which may increase the likelihood of identifying students in need. Similarly, students with mental health difficulties tend to have friends with similar difficulties (Prinstein et al., 2010; Meisel & Goodie, 2015), and thus may be exposed to a greater number of at-risk students.

Methods

Participants

Participants included 231 university students (ages 16-48), recruited from a diverse campus of over 20,000 undergraduate students. The university population is 49% White, 14% Asian, 10% Hispanic Latino, 9% Black/African American, 3.5% Bi-racial, 3% Native Hawaiian/Pacific Islander, and 1% Native American/Alaska Native. The university is largely a commuter school with only 18% of students living on campus. Participants were included if they: 1) were older than 18 years of age; 2) had not completed a gatekeeper training before; and 3) were proficient in English. See Table 1 for socio-demographics of the study sample.

Procedures

Participants were recruited through an online university system (SONA) that posts studies students can take part in to earn research participation credits for psychology courses, as well as in-person recruitment in the broader University community (i.e., presented study during group meetings at fraternities, sororities, clubs). All participants provided informed consent and filled out a 1-hour online baseline assessment, remotely, prior to attending an in-person 1-hour gatekeeper training on campus. Five master's level clinical psychology doctoral students, trained in the manualized gatekeeper protocol, facilitated the gatekeeper trainings (see below for details of the protocol). Training of these trainers was conducted in a four-hour workshop, delivered by the University counseling center staff member who developed the gatekeeper training program, via didactic presentations, discussions, and role-plays.

Immediately after the trainers delivered the gatekeeper training to college student participants, participants filled out a 15-minute post-training knowledge assessment via paper and pencil at the training location. Students either received 3 hours of research credit (those recruited through SONA) or $12 in cash (those recruited in the college community) for completing the baseline assessment, the training, and pre-post knowledge assessments. After the training, a research assistant provided participants with a range of dates to choose from for their 3-month follow-up assessment. When participants were due for their 3-month follow-up, a reminder e-mail, phone call, or text message was sent to them with instructions for filling out the assessment remotely, from their personal computers. The 3-month follow-up assessment took approximately 30 minutes to complete and participants received $20 upon completion.

Suicide Prevention Gatekeeper Training. The 1-hour manualized gatekeeper training, developed by staff in the on-campus University counseling center, was modeled after the well- established Question, Persuade, Respond (QPR; Quinnett, 1995; Quinnett, 2007) training. This training focused on teaching participants to: recognize the signs of distress in peers, ask directly about suicidal thoughts, and follow university referral system guidelines to ensure at-risk students are connected to professional help. The didactic portion of the training was approximately 45 minutes and was followed by a 15-minute block during which participants paired off to practice communication and referral skills through role-plays. Participants based their role-play on a case example of a college student who demonstrated warning signs of suicide. In addition, participants were provided with a manual to keep that contained psycho-education on suicide (i.e., college

suicide statistics and facts, reasons why college students attempt suicide, myths and facts related to suicide), a conversation guide (i.e., how to ask peers about suicide, how to listen and respond to peers in crisis), and a referral guide (i.e., procedures and contacts).

Measures
  Demographics. Demographic information was gathered using a form that asked for participant age, sex, race, ethnicity, sexual orientation, military status, academic year, major, and participation in organizations or groups at the University.

  Change in Knowledge. Change in declarative suicide knowledge was assessed with the same set of questions based on material presented in the 1-hour training program administered at baseline and post-training. The assessment of declarative knowledge required participants to respond to ten *true* or *false* statements that assess retention of suicide facts and prevention skills covered in the training. Scores could range from 0-10.

  Identification and Referral. Identification of suicidal students was assessed with the question, "How many suicidal students have you identified in the last 3-months?". Referral of suicidal students was assessed with the question, "How many suicidal students have you referred for concerns related to suicide in the last 3-months?".

  Psychiatric Symptoms. The Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983) is a 53-item self-report measure that assesses psychological functioning in adults. Participants rate the extent to which they have been bothered (0 ="not at all" to 4="extremely") in the past week by various symptoms. The BSI has nine subscales designed to assess individual symptom groups: somatization (SOM, e.g., "Faintness or dizziness"); obsessive-compulsive (OC, e.g., "Having to check and double-

check what you do"); interpersonal sensitivity (IS, e.g., "Feeling inferior to others");

depression (DEP, e.g., "Feeling no interest in things"); anxiety (ANX, e.g., "Feeling tense

or keyed up"); hostility (HOS, e.g., "Having urges to break or smash things"); phobic

anxiety (PHB, e.g., "Feeling uneasy in crowds, such as shopping or at a movie");

paranoid ideation (PAR, e.g., "Others not giving you proper credit for your

achievements"); and psychoticism (PSY, e.g., "The idea that something is wrong with

your mind"). The BSI also includes a global severity index (GSI). The BSI has adequate

reliability (α =.71-.85; r =.68-.91) and validity (Derogatis, 1993). The GSI index T-score

was examined in the present analyses. The GSI demonstrated acceptable reliability (α

=.97) in the present sample.

Cognitive Ability. Cognitive ability was assessed through participants' self-report of

their GPA and of their SAT/ACT scores. To equate scores across tests, SAT and ACT

scores were converted to percentiles for study analyses.

Personality Traits. Personality traits were assessed using The Big Five Inventory

(BFI; John, Naumann, & Soto, 2008; John, Donahue, & Kentle, 1991). The BFI is a 44-

item measure with five scales: Extraversion (8 items), Agreeableness (9 items),

Conscientiousness (9 items), Neuroticism (8 items), and Openness (10 items).

Participants are asked to read the phrase ''I am someone who. . .'' followed by

descriptive statements (e.g., ''can be moody''), and indicate the degree to which they

agree with each statement using a 5-point Likert scale ranging from 1 (Disagree Strongly)

to 5 (Agree Strongly). The reliability and validity of the BFI has been established across

age, gender, and culture (e.g., Soto & John, 2009; Worrell & Cross, 2004), and research

supports a five-factor solution (e.g., Fossati, Borroni, Marchione, & Maffei, 2011).

Coefficient alphas (e.g., α= .70 to .80) and test–retest reliabilities (e.g., r = .75 -.90)

across scale scores are satisfactory (e.g., Benet-Martínez & John, 1998; Worrell & Cross,

2004) in cross-cultural samples using multiple translations of the measure. The

conscientiousness and extraversion scales were used in the present analyses. Each scale

demonstrated acceptable reliability in the present sample (extraversion, α = .86;

conscientiousness, α = .86)

   Motivation. Motivation was assessed with the Work Preference Inventory (WPI;

Amabile, Hill, Hennessey, & Tighe, 1994). The WPI, a 30 item self-report measure,

assesses individual differences in intrinsic and extrinsic motivation using a 4 point likert

scale ranging from 1 (never or almost never true for me) to 4 (always or almost always

true for me). The intrinsic motivation scale, which includes subscales for "enjoyment"

and "challenge", were used in the present study. The WPI has demonstrated reliability

and validity in college students and working adult samples (Amabile et al., 1994). In the

present study, coefficient α for the intrinsic motivation scale was .80.

   Emotional Intelligence. Emotional intelligence was assessed using the Total

Emotional Score of the Social Skills Inventory (SSI; Riggio, 1986). The 45-items in the

Total Emotional score assess expressivity, sensitivity, and control in the social emotional

realm, and has been used as a self-report measure of emotional intelligence (See Murphy,

2002). The items include self-descriptive statements rated on a 5-point likert scale

ranging from 1 "not at all true of me" to 5 "very true of me". The Total Emotional Score

consists of three subscales (15 items in each), including emotional expression, emotional

sensitivity, and emotional control, which demonstrated marginal to adequate test-retest reliability in the present sample (coefficient α = .63, .80. and .83, respectively).

Problem-Solving. Problem-solving was assessed using the 25-item Social Problem-Solving Inventory – Revised: Short Version (SPSI-R:S; D'Zurilla & Nezu, 1990; D'Zurilla, Nezu, & Maydeu-Olivares, 2007). This measure assesses strengths and weaknesses in problem- solving abilities across five domains (positive problem orientation, negative problem orientation, rational problem solving, impulsivity/carelessness style, avoidance style). For these analyses we used the positive problem orientation and rational problem-solving scales to capture a "positive" problem-solving orientation. In the present study, coefficient α was .77 for the positive problem orientation scale and .76 for rational problem-solving scale.

Social Connectedness. Social connectedness was assessed with the 5-item Social Connections Index (SCI; Kaplan, Salonen, Cohen, Brand, Syme, & Pusk, 1988). The SCI measures the extent and frequency of social interaction (i.e., planned visits with friends and relatives, meetings with clubs and societies, number of daily interactions, marital status). Some questions (e.g., How often do you visit friends and relatives) have response categories ranging from 1 "Never" to 6 "Several times a week". Other questions (e.g., How many people usually come to see you or call you per day) have response categories ranging from 1 "None" to 6 "More than 10". Marital status, a dichotomous variable, is weighted 1 (unmarried) or 4 (married) to equalize its contribution to the total score. A total score is obtained by summing items across categories. The SCI has demonstrated

adequate reliability and validity in adult samples (Kaplan et al., 1998). The Social

Connections Index demonstrated marginal reliability in the present sample (α= .51).

Follow-up Missing Data

A total of 231 participants completed the pre-training baseline assessment and the

training. One hundred seventy-eight out of 231 participants (77%) were retained in the

study from baseline to 3-month follow-up. Of these 231 participants, 53 failed to respond

to multiple attempts by study staff to contact them for the 3-month follow-up.

Univariate statistics (chi-squares, independent sample t-tests) were conducted to

determine whether there was a difference between participants who completed the 3-

month follow-up versus those who did not on socio-demographic variables. No

significant differences were found in age ($t = -.03$, $p = .98$), race [Black/African

American, $X^2(1, N = 231) = .02$, $p = .55$; White/Caucasian, $X^2 (1, N = 231) = .19$, $p = .39$;

Asian, $X^2 (1, N = 231) = .33$, $p = .53$], or ethnicity (Hispanic vs. Non-Hispanic), $X^2 (1, N$

$= 231) = .08$, $p = .06$. However, more females (70.6%) than males (29.4%) completed the

3-month follow-up ($X^2 (1, N = 231) = 9.2$, $p = .002$). Given gender differences in follow-

up rates, gender was controlled for in the main study analyses.

Data Analysis Plan

First, parcels were created to represent latent constructs. Each latent construct was

represented using 2 to 3 parceled indicators (Little et al., 2002) when possible. Item

parceling is a technique that involves breaking a measure up into a smaller number of

groups, or parcels, by combining two or more individual items (Bandalos, 2008, Sass &

Smith, 2006). This technique is preferred over use of individual items for the following

reasons: 1) it reduces the number of indicators for each factor and, as a result, reduces estimation errors; 2) it is less likely to result in violation of multivariate normality assumption criteria than use of individual items; 3) parcels are better indicators of latent factors (produce larger factor loadings); and 4) parceling improves model fit (Bandalos, 2008; Sass & Smith, 2006). Parcels were created with subscales or groups of conceptually similar items as opposed to randomly generated parcels because it prevents any specific factor variance from contaminating the latent construct (Landis, Beal, & Tesluck, 2000; Little et al., 2002). We calculated coefficient alphas for each parcel to assess reliability.

After reliable parcels were created, a series of bivariate correlations were run to examine the individual relationships among potential covariates, parcels representing latent constructs, and manifest indicators included in the hypothesized model. Covariates found to be significantly correlated with the main study outcomes were controlled for in study analyses. Gender was also controlled for in analyses due to differences in study retention across males and females.

Next, a series of structural equation analyses were conducted using AMOS (Analysis of Moment Structures; Arbuckle, 1995) to test the measurement and theoretical models. A two-step approach to structural equation modeling was used (Anderson & Gerbing, 1988). First, the measurement model was tested with all latent constructs and covariates correlated. For single indicators, we set the loading to 1 and set the error variance to zero in order to identify the latent variable's variance. For 2 parcel indicators, the loading of one parcel was fixed to 1, the rest were freely

estimated, and the error variances were set to be the same. For 3 parcel indicators, all loadings were set to 1 and the remaining loadings and error variances were allowed to be freely estimated. Second, the hypothesized structural model was tested. We added in regression paths that are consistent with those shown in Figure 1. We also included direct pathways from exogenous to outcome variables that are not depicted in Figure 1. In addition, we added correlations between all predictors, all covariates, predictors and covariates, and the mediator and outcome disturbances. We fully saturated the model by adding in all the possible correlations in our structural model so that the degrees were the same for the measurement model and structural model.

The fit of the data with the proposed theoretical model was evaluated by examining the difference between the observed and implied covariance matrices using multiple fit indices. Model fit was explored in all models using Root Mean Square Error of Approximation (RMSEA; below .08), Comparative Fit Index (CFI; above .95), Tucker Lewis Index (TLI; above .95) and Chi-square values (Byrne, 2010; Kline, 2011). Full information maximum likelihood (FIML) estimation was used to address missing data. FIML uses all of the information of the observed data to create parameter estimates and standard errors (Enders, 2010).

Results

First, parcels were created to represent each latent construct (see Table 7 and Figure 2). For intrinsic motivation, the subscales of challenge (IMOT P1) and enjoyment (IMOT P2) from the Work Preferences Inventory were used as parcels. For problem-solving, the subscales of positive problem orientation (PSS P1) and rational problem-solving (PSS

P2) from the Social Problem-Solving Inventory were used as parcels. The parcels for other latent constructs were created by grouping conceptually similar items within the specific scale under study, as is recommended by Landis et al. (2000) and Little et al. (2002). This includes emotional sensitivity, extraversion, and conscientiousness. Notably, attempts were first made to use the 3 subscales from the Social Skills Inventory as parcel indicators for emotional intelligence (i.e., emotional sensitivity, emotional control, and emotional expressivity subscales) but factor loadings for each parcel were below .4 indicating that they were weak representations of emotional intelligence (Kline, 2011). As a result, the emotional sensitivity (i.e., the ability to perceive and manage the emotions of others) subscale was retained and two conceptually based parcels were created (EMS P1, EMS P2). The emotional sensitivity subscale was selected and parceled because it best represents a quality necessary for gatekeepers to effectively identify a student experiencing an emotional crisis. Extraversion was represented with two conceptually based parcels (EXT P1, EXT P2) and conscientiousness with three conceptually based parcels (CONS P1, CONS P2, CONS P3).

Other variables were represented as manifest indicators and not parceled. This includes SAT, GPA, and suicide knowledge. Notably, attempts at combining the observed SAT/ACT percentiles and GPA to represent a latent "cognitive ability" construct were unsuccessful. GPA and SAT/ACT were not correlated. As a result, they were retained as individual parcels in the model.

As shown in Table 7, the standardized factor loadings for each parcel on their latent constructs were strong (i.e., above .4) and significant ($p < .001$). Most of the parcels had

acceptable internal consistency for SEM (see Table 7). However, the alphas for the first consciousness and intrinsic motivation parcels were low. The low alpha values for CONS P1 (3 items) and IMOT P1 (5 items) are potentially due to the smaller number of items (Cortina, 1993).

We examined the individual relationships among covariates, each parcel that comprised a latent construct, and variables measured as manifest indicators. Table 8 includes the means, standard deviations, ranges, and bivariate intercorrelations among potential covariates, parcels representing latent constructs, and manifest indicators. Notably, none of the parcels or manifest indicators in the model were correlated with change in identification or referral of suicidal peers from pre-training to 3-month follow-up. Change in number of suicidal students identified (pre-training to 3-month follow-up) and referred for mental healthcare (pre-training to 3-month follow-up) were significantly correlated with each other and with baseline referrals and identifications. There was also a significant correlation between social connectedness, but not psychiatric symptoms, and change in referrals. We also examined the association between socio-demographic variables (age, gender, race, and ethnicity) and dependent variables (identifications and referrals) using correlations and independent sample t-tests but found no significant associations.

All continuous study variables were normally distributed, with skewness and kurtosis values less than 1.8 (Field, 2009), except for the change in identification and referrals variables. The skewness values for change from pre-training to 3-month follow-up identifications and referrals were less than 1.8. However, the kurtosis for change from

pre-training to 3-month follow-up identifications and referrals were 6.18 and 4.48, respectively.

Social connectedness, gender, pre-training identification of suicidal students, and pre-training referral of suicidal students were controlled for in the measurement model and the full model. The measurement model, which allowed all constructs to correlate with each other, showed a marginal fit ($X^2_{(92, N=231)} = 152.20$, $p = .00$, TLI = .897, CFI = .955, RMSEA = .053). The hypothesized path model, shown in Figure 1, also showed marginal model fit ($X^2_{(92, N = 231)} = 152.22$, $p = .00$, TLI = .897, CFI = .955, RMSEA = .053). Table 1 shows the unstandardized estimates for the measurement model and the amount of reliable variance (R^2) and internal consistence (α) of each parceled variable.

The standardized coefficients from the path analysis are shown in Figure 3. Extraversion significantly predicted emotional sensitivity ($\beta = .35$, $p < .001$). Intrinsic motivation had a significant effect on both emotional sensitivity ($\beta = .42$, $p < .001$) and positive problem- solving skills ($\beta = .69$, $p < .001$). No other significant effects existed between the predictors and the mediators in the model. All indirect paths in the model between the mediators and the outcomes were non-significant. The direct paths from GPA ($\beta = -.02$), SAT ($\beta = .00$), extraversion ($\beta = .04$), conscientiousness ($\beta = -.09$), and motivation ($\beta = .10$), to number of suicidal students identified, as well as the direct paths from GPA ($\beta = -.04$), SAT ($\beta = .01$), extraversion ($\beta = .03$), conscientiousness ($\beta = -.14$), and motivation ($\beta = .12$), to number of suicidal students referred for mental healthcare, were also non-significant.

It is possible that some of the non-significant results were due to high multicollinearity between the predictors and mediators. Therefore, we tested models where each predictor and mediator variable was tested as a sole predictor of change in identifications and referrals. Still, none of the predictor and mediator variables were significant (p > .05). This confirmed the null results.

Discussion

The benefits of suicide prevention gatekeeper training programs are well documented on college campuses. However, little is known about characteristics of individuals who may learn and retain the most knowledge from gatekeeper training, or apply their knowledge and skills to identify and refer suicidal students for professional help. Data collected within secondary school settings suggest that personnel and parents with prior exposure to suicide (Cross et al., 2011), mental health care professionals (Condron et al., 2015), and peers who hold the beliefs that *suicide is not a way to solve problems* and *adults can help suicidal students* (Wyman et al., 2010), are more likely to identify and refer suicidal students to a mental health professional. To our knowledge, the present study is the first to examine whether a theoretically based leadership model can be applied to the prediction of peer gatekeeper effectiveness (i.e., identification and referral of suicidal students) in a sample of college students.

Consistent with study hypotheses, higher extraversion significantly predicted greater emotional sensitivity (a component of emotional intelligence). These results are consistent with previous studies that have linked extraversion with higher emotional intelligence in samples of teachers and adults in the workplace environment (Nawi,

Rezuan, & Hamsan, 2012; Petrides, Vernon, Schermer, Ligthart, Boomsma, & Veselka, 2010). The present study extends these findings to the college population, and suggests that those college students who are more socially oriented tend to pay closer attention to others' emotions. Also consistent with previous studies conducted with samples of secondary school students (e.g., MacKinnon, 1999; Song & Grabowski, 2006), students with greater intrinsic motivation were more likely to report "positive" problem-solving skills. Specifically, intrinsic motivation to help others was associated with a greater perceived positive problem-orientation and rational problem-solving skills. The present study also found a positive relationship between intrinsic motivation to help others and emotional sensitivity. Thus, those who were motivated to help others were also more in tune with others' emotions. These findings build upon research, which suggests that other types of motivation, such as motivation to lead, is associated with social intelligence (Chan & Drasgrow, 2001).

Contrary to study hypotheses, no other significant associations were found between the broad distal (i.e., GPA/SAT, extraversion, conscientiousness, intrinsic motivation) and more proximal (problem-solving, emotional sensitivity, knowledge obtained during the gatekeeper training) leadership traits examined in the model. Further, there was no direct association between any of the broad or proximal leadership traits under examination and study outcomes (i.e., change in identification or referral suicidal students). Thus, there was no evidence that the specific proximal leadership traits (i.e., problem-solving, knowledge, or emotional sensitivity) mediated the relationship between

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distal traits (i.e., extraversion, conscientiousness, intrinsic motivation, and cognitive ability) and identifications or referrals of suicidal students for help.

The lack of hypothesized associations may stem from several causes. First, it is possible that low power due to a relatively small sample size may explain the lack of statistically significant associations. Post-hoc power analyses using the G*Power 3.1 software (Faul, Erdfelder, Buchner, & Lang, 2009), support this assertion for the detection of small effects. Given the sample size of 178 at 3-month follow-up and α = .05, the power (1- β) to find a significant small effect (.15) in a semi-partial correlation is .60, which is smaller than the conventionally recommended minimum power of .8 (Cohen, 1992). Thus, we may indeed have made a Type II error in failing to reject the null hypothesis for small direct and indirect effects. Notably, G*Power suggests that a sample of 178 *is* large enough to detect a medium effect (.3) in semi-partial correlations, with a calculated power of 1.00 (since a larger effect is easier to detect). Thus, it is unlikely that the hypothesized traits had medium or larger effects on change in number of students identified or referred for mental healthcare.

Second, the lack of hypothesized association may also stem from limitations inherent in the measurement of various constructs, especially cognitive ability, emotional intelligence, identification of suicidal students, and referral of suicidal students for mental healthcare, in the current study. Some studies consider GPA and SAT measures of academic achievement as opposed to cognitive ability (e.g., Rohde & Thompson, 2007). While there is empirical evidence to support a strong association between cognitive ability (e.g., reasoning, perception, memory, verbal and mathematical ability, and

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problem solving) and academic achievement (e.g., performance outcomes that indicate the extent to which specified goals that were the focus of instructional activities in academic settings were accomplished) among college students (Ferentinos, 1996; Judge, Colbert, & Ilies, 2004), more than 50% of the variance in academic achievement is unaccounted for by measures of general cognitive ability alone (Rohde & Thompson, 2007). The remaining variance may be accounted for by circumstances encountered in the learning environment (Ceci, 1991). Thus, it is possible that GPA and SAT may have offered a measure of academic achievement as opposed to pure cognitive ability as represented in Zaccaro et al.'s (2004) model. In future research, it will be important to use standardized assessments of cognitive ability (e.g., Kaufman Brief Intelligence Test, Second Edition (KBIT-2); Kaufman & Kaufman, 2004) in tests of the Zaccaro et al. (2004) model.

Similarly, Zaccaro et al. (2004) suggest that social intelligence acts as a mediator in their leadership model. The present study used a measure of emotional sensitivity, which only captures one aspect of social intelligence (Mayer, Roberts, & Barsade, 2008). Thus, it is possible that other aspects of social intelligence, not measured in the present study, may better explain the hypothesized associations. In future research, it will be important to use performance-based measures (e.g., Observational Rating Scale of Gatekeeper Skills; Cross et al., 2010) that tap elements of social intelligence critical to effective peer gatekeeping in particular (e.g., active listening, asking clarifying questions, using convincing phrases to persuade suicidal individuals to seek help) to provide a better test of the Zaccaro et al. (2004) model.

Also worthy of discussion is that identification and referral of suicidal peers were assessed with two open ended questions in this study, including "How many students have you identified for concerns about suicide in the past 3 months?" and "How many students have you referred for concerns about suicide in the past 3 months?". These questions may have been too broad and did not allow for a normal distribution of responses. For example, in a study conducted to test a suicide gatekeeper training in secondary schools, Wyman and colleagues (2010) asked the following two questions: ''I told a friend who was considering suicide to get help from an adult'' and ''I told a friend to get help because of emotional or behavior problems''. Participants replied using a 5-point likert type frequency scale (never, 1–2, 3–5, 6 or more times). In future research, it will be important to use more specific response options that better facilitate a normal distribution of responses.

Other limitations

In addition to the concerns noted above, this study has a number of additional limitations. First, this study only included self-report measures. Future research should include an objective measure of referrals (i.e., change in number of students who sought referrals at the college counseling center) as well as social and problem-solving skills (i.e., observation of participants performing skills in a role play). Second, as is the case with most research in this area, the follow-up assessment period was rather brief (3 months) and thus may not have sufficiently captured the gatekeeper's full effectiveness (i.e., their ability to identify and refer suicidal individuals over time). Longer follow-up periods (6 and 12 months) are recommended in future research. Third, there may have

been a self-selection bias because participants who signed up for the gatekeeper training may have been different from those who chose not to participate. Finally, given that this study was conducted at one institution, the ability to generalize these results to other samples is limited. Future research is needed to explore whether these personal characteristics predict effectiveness of gatekeepers at other universities.

Implications

Within colleges, counseling centers are tasked with training gatekeepers to sustain gatekeeper programs. Currently, counseling centers face the challenge of balancing dwindling resources with increased demands for services from students with increasingly severe psychopathology (Cooper, 2000; Sharkin, 2011). With a sizable portion of resources being allocated toward treating serious mental illness, counseling centers are left with limited funds for gatekeeper trainings and, as a result, grapple with the question of how to sustain gatekeeper training programs with limited resources. One option is to limit the number of trainings offered and focus only on those students who are likely to be most effective as gatekeepers. The Zaccaro et al. (2004) leadership model, as measured in the present study, did not aid in prediction of effective gatekeeping behavior. However, the present study had a number of limitations that may explain the null results.

In future tests of the Zaccaro et al. (2004) model as applied to effective gatekeeper behavior, it will be important to measure variables in a manner more consistent with this model, obtain more precise measurement of student referrals (e.g., track number of students who present at the college counseling center upon recommendation of a trained peer gatekeeper), include longer follow-ups, and use larger

study samples to increase power to detect small effects. It would also be of interest to test

other leadership models to determine whether they better explain peer gatekeeper

effectiveness.

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TABLES AND FIGURES

Table 1 Sociodemographic and baseline characteristics of study participants (n = 231)

Age (years)	
M (SD)	21.1 (1.3)
Birth Gender, *n* (%)	
Female	151 (65.4)
Male	80 (34.6)
Racial background, *n* (%)	
White/Caucasian	131 (56.7)
Asian/Pacific Islander	50 (21.6)
Black/African American	27 (11.7)
Other/Mixed Race	23 (10)
Ethnicity, *n* (%)	
Hispanic	34 (14.7)
Non-Hispanic	197 (85.3)
Year at University	
Freshman	85 (36.8)
Sophomore	47 (20.3)
Junior	48 (20.8)
Senior	50 (21.6)
Graduate student	1 (.4)

Table 2 Bivariate intercorrelations

	1	2	3	4	5	6	7	8	9	10
1. Pre-Declarative	-	.06	.20**	-.07	.21**	.09	-.05	-.14*	-.02	-.04
2. Pre-Perceived		-	-.12	.37**	-.10	.30**	.02	.20**	-.03	.01
3. Post-Declarative			-	.12	.34**	.09	-.11	-.14*	.04	.02
4. Post-Perceived				-	.02	.42**	-.02	.07	.02	.01
5. Follow-up Declarative Knowledge					-	.21**	-.13	-.11	-.05	-.05
6. Follow-up Perceived Knowledge						-	-.01	.08	.11	.10
7. Baseline Identifications							-	.51**	.14	.11
8. Baseline Referrals								-	.13	.09
9. Follow-Up Identifications									-	.89*
10. Follow-Up Referrals										-

Note. *p >.05, **p >. 01

Table 3 Summary of results for main outcomes

Outcomes	Baseline n = 230	Post-Training n = 230				3 Month Follow-up n = 178			
	M (SD)	M (SD)	t	p	Cohen's d	M (SD)	t	p	Cohen's d
Knowledge									
Perceived	86.2 (27.6)	123.3 (16.0)	21.2	<.001	1.44	118.3 (19.3)	14.7	<.001	1.10
Declarative	6.5 (1.5)	9.2 (1.0)	24.6	<.001	1.62	8.3 (1.5)	12.5	<.001	0.94
Dissemination									
Identifications	.24(.60)					.33 (.61)	1.6	.110	0.12
Referrals	.14 (.42)					.31 (.60)	3.2	.002	0.24

Note. **size range (Cohen's *d*): .20 = small, .50 = medium, and .80 = large effect size.**

Table 4 Linear regression analyses with demographic variables predicting change in declarative knowledge

	B	Standard Error	β	R^2	ΔR^2
Pre-training Declarative Knowledge	-.86	.05	-.78*	.59*	.59
Age	.02	.02	.04	.59	.00
Pre-training Declarative Knowledge	-.85	.05	-.77*	.59*	.59
Gender (male = 0; female = 1)	.33	.14	.10	.60	.01
Pre-training Declarative Knowledge	-.87	.05	-.78*	.59*	.59
White	.45	.23	.14		
Black	-.10	.29	-.02	.61	.02
Asian	.08	.26	.02		
Pre-training Declarative Knowledge	-.86	.05	-.77*	.59*	.59
Ethnicity	-.12	.19	-.03	.59	.00

Note. Ethnicity was assessed by asking participants "Are you Hispanic or Latino?" Participants responded 0 = "Yes" or 1 = "No".
*$p < .004$

Table 5 Linear regression analyses with demographic variables predicting change in perceived knowledge

	B	Standard Error	β	R^2	ΔR^2
Pre-training Perceived Knowledge	-.78	.03	-.82*	.68*	.68
Age	.68	.26	.10	.69	.10
Pre-training Perceived Knowledge	-.78	.03	-.81*	.68*	.68
Gender (male = 0; female = 1)	9.82	1.98	.18*	.71*	.03
Pre-training Perceived Knowledge	-.80	.04	-.83*	.68*	.68
White	1.00	3.47	.02		
Black	-2.05	4.33	-.02	.68	.00
Asian	-1.12	3.87	-.02		
Pre-training Perceived Knowledge	-.79	.04	-.82*	.68*	.68
Ethnicity	-.94	2.78	-.01	.68	.00

Note. Ethnicity was assessed by asking participants "Are you Hispanic or Latino?" Participants responded 0 = "Yes" or 1 = "No".
*$p < .004$

Table 6 Linear regression analyses with demographic variables predicting change in referrals

	B	Standard Error	β	R^2	ΔR^2
Pre-training referrals	-.86	.11	-.52*	.27*	.27
Age	.01	.01	.04	.27	.00
Pre-training Referrals	-.86	.11	-.52*	.27*	.27
Gender(male = 0; female = 1)	.03	.10	.02	.27	.00
Pre-training Referrals	-.87	.11	-.52*	.27*	.27
White	.12	.16	.08		
Black	-.03	.20	-.02	.28	.01
Asian	.07	.18	.04		
Pre-training Referrals	-.86	.11	-.52*	.27*	.27
Ethnicity	.23	.12	.12	.29	.01

Note. Ethnicity was assessed by asking participants "Are you Hispanic or Latino?". Participants responded 0 = "Yes" or 1 = "No".
p < .004

Table 7 AMOS estimates of measured parcels for the total sample in the measurement model (n = 231)

Parcel	α	Standardized Factor Loading	λ	SE	R^2
Extraversion					
EXT P1	.81	.73*	.73	.06	.53
EXT P2	.78	.89*	.73	.04	.79
Conscientiousness					
CONS P1	.46	.85*	.72	.04	.73
CONS P2	.60	.71*	.56	.04	.50
CONS P3	.58	.68*	.44	.03	.46
Intrinsic Motivation					
IMOT P1	.53	.65*	.33	.02	.42
IMOT P2	.80	.72*	.33	.01	.52
Problem Solving					
PSS P1	.77	.80*	.60	.03	.65
PSS P2	.76	.71*	.60	.04	.51
Emotional Sensitivity					
EMS P1	.73	.78*	.54	.03	.41
EMS P2	.81	.64*	.54	.05	.61

Note. Lambda (λ) represents the unstandardized variance explained in each indicator (i.e., parcel) by the latent variable. Standard errors of estimate (SE) are given for the unstandardized variance. Alpha (α) represents Cronbach's alpha (internal consistency) for each of the measured parcels. R^2 represents the amount of variance explained by the latent variable in each of the measured parcels.
***p < .001**

Table 8 Bivariate intercorrelatons between potential covariates, parcels representing latent constructs, and manifest indicators

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. SAT	-	.03	.09	.04	-.20*	-.23**	-.15	-.05	-.08	-.08	-.04	.03	.09	.08	-.02	.01	.16	.04	.08	.13
2. GPA		-	.03	.04	.25**	.18**	.21**	-.12	-.02	.03	.03	.01	.03	.01	-.02	-.03	-.02	-.02	-.04	.02
3. EXT P1			-	.64**	.20**	.08	.05	.08	.06	.21**	.16*	.21**	.23**	-.04	.01	-.05	.29**	.04	.10	-.22**
4. EXT P2				-	.28**	.18**	.32**	.20**	.17**	.36**	.21**	.32**	.25**	.02	.01	.03	.29**	.02	.05	-.25**
5. CONS P1					-	.63**	.57**	.17**	.19**	.33**	.28**	.16*	.18**	.00	.03	.03	.17*	-.07	-.07	-.30**
6. CONS P2						-	.45**	-.08	.08	.25**	.24**	-.03	-.03	-.03	-.05	-.06	.01	-.05	-.08	-.38**
7. CONS P3							-	.21**	.20**	.37**	.31**	.23**	.09	-.03	-.01	-.04	.06	-1.0	-.11	-.22**
8. IMOT P1								-	.46**	40**	.30**	.20**	.25**	-.03	-.03	.07	.08	.00	-.06	-.07
9. IMOT P2									-	.46**	.45**	.32**	.33**	-.01	.00	.01	.08	.00	.02	.04
10. PSS P1										-	.57**	.28**	.28**	.05	.11	.08	.17*	-.12	-.07	-.31**
11. PSS P2											-	.36**	.30**	.08	.02	.05	.02	-.01	.04	-.21**
12. EMS P1												-	.49**	-.01	.02	.06	.11	.10	.05	.09
13. EMS P2													-	.06	-.04	-.11	.15*	.04	.10	.08
14. Know														-	.08	.08	-.06	-.02	.04	.03
15. ID															-	.69**	.13	-.65**	-.29**	.00
16. Referrals																-	-.15*	-.21**	-.52**	-.04
17. SC																	-	.02	.04	-.06
18. Pre-ID																		-	.51**	.10
19. Pre-REF																			-	.09
20. GSI																				-
Mean	60.1	3.2	3.0	3.6	3.6	3.2	4.0	1.5	2.1	2.4	2.4	3.4	3.1	2.6	.09	.17	14.9	.23	.12	.58
SD	25.2	.49	.99	.83	.85	.80	.66	.50	.47	.75	.84	.70	.82	1.6	.79	.70	3.5	.59	.40	.57
Range	3-99	1.0-3.0	1.0-4.0	1.5-3.5	1.0-4.0	1.2-3.7	1.7-3.3	.40-2.6	.80-2.2	.80-4.0	.40-4.0	1.75-5.0	1.14-5.0	-2.00-7.0	-4.0-3.0	-3.0-3.0	4.0-22.0	0-4	0-3	0-3.2

Note. GSI = General Symptom Index to assess over all psychiatric symptoms; Pre-ID = Baseline identifications (identifications made 3 months prior to training); Pre-REF = Baseline referrals (i.e., referrals made 3 months prior to training); Know = Knowledge; SC = Social Connectedness.
*p < .05; **p < .01
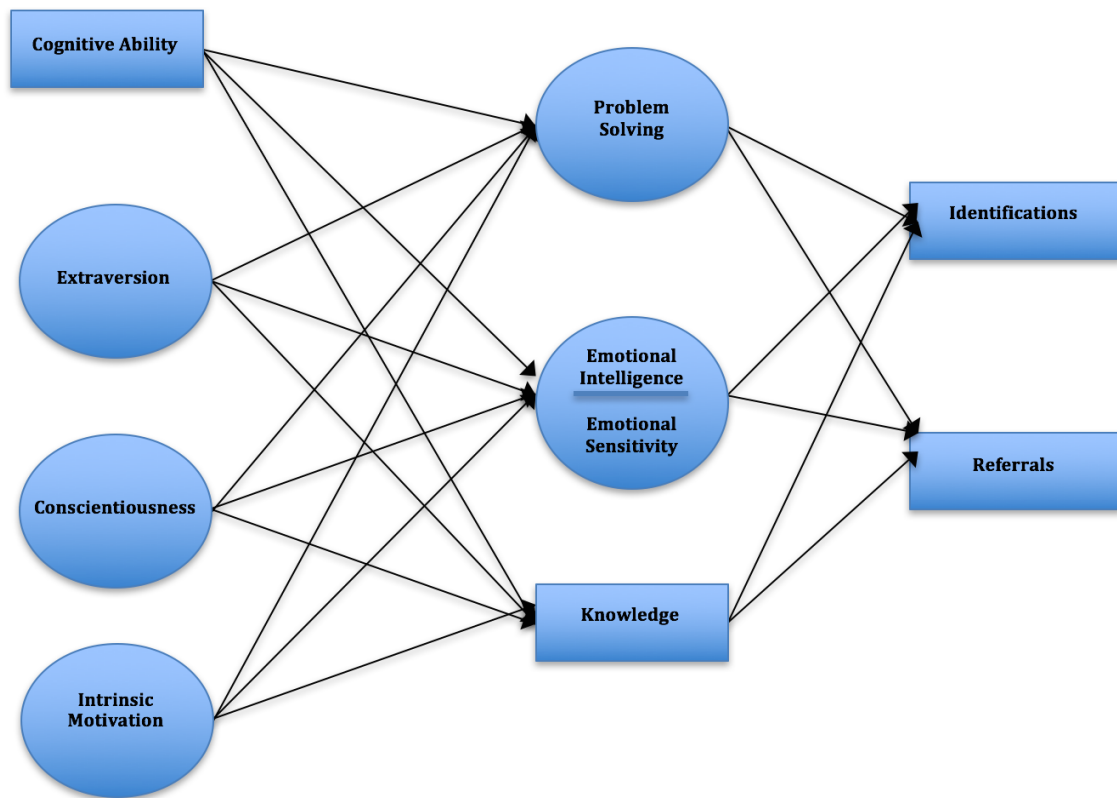
Figure 1 Model of leader attributes and performance adapted from Zaccaro et al. (2004). Direct pathways from exogenous to outcome variables are not depicted to simplify the model. The relationship between these variables should become non-significant when mediators are in the model.
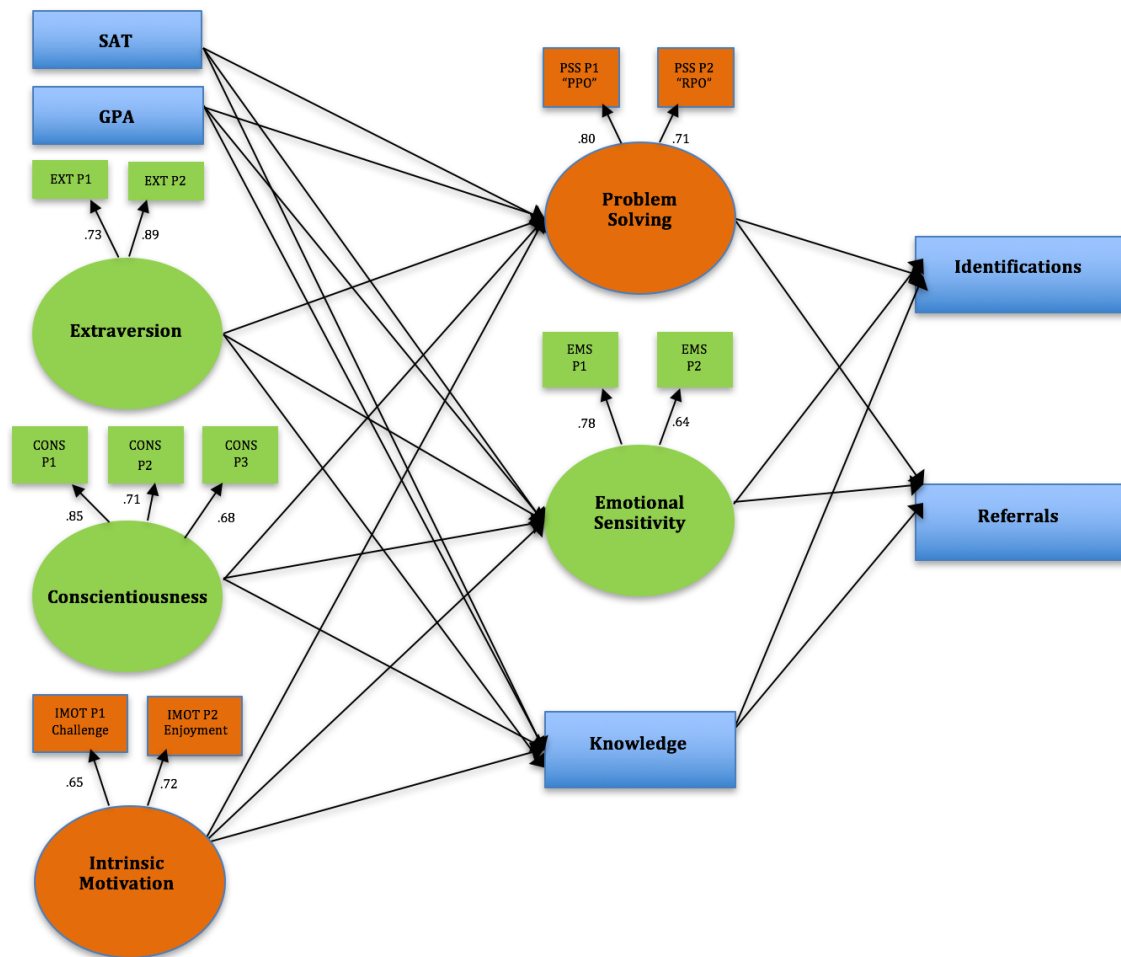
Figure 2 Structural equation model with manifest indicators and parcel loadings on latent variables represented.
Note. PPO = Positive Problem Solving Orientation; RPO = Rational Problem Solving Orientation.
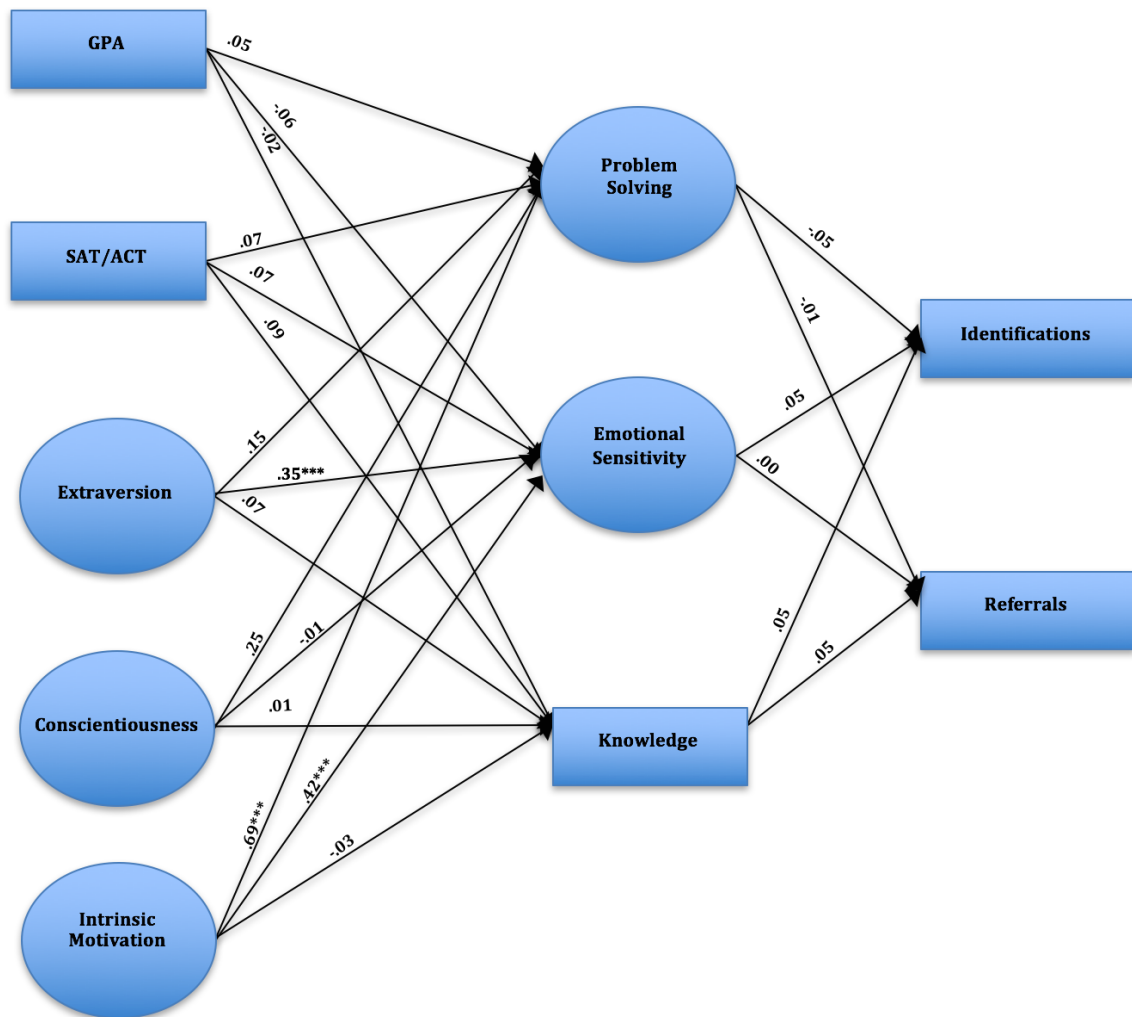
Figure 3 Structural equation model with standardized regression coefficients. Direct pathways from exogenouse to outcome variables are not depicted to simplify model.

APPENDIX A

Suicide is currently the second leading cause of death among college students (Turner, Leno, & Keller, 2013). According to data collected from college counseling center directors representing 275 colleges across the United States, 125 college students died by suicide in 2014 (Gallagher, 2014). Up to 48% of college students in a national sample reported thoughts of death (i.e., wish they were dead) and 6% seriously considered attempting suicide over the last year (Drum, Brownson, Burton Denmark, & Smith, 2009). Of those students who considered killing themselves, 69% report repeatedly thinking about killing themselves and 14% actually attempt suicide (Drum et al., 2009). Given the prevalence of suicidal thoughts and risk for suicide attempts as well as completions among college students, research into effective suicide prevention strategies on college campuses is extremely important.

Although a significant number of students on college campuses contemplate suicide, less than half of these students seek professional help (Drum et al., 2009). The failure to seek services can prove fatal; 80 to 90% of college students who die by suicide did not seek services at their college's counseling center (Gallagher, 2014; Kisch, Leino, & Silverman, 2005). The underutilization of these resources by students who need them most may result from several causes: lack of knowledge of available resources (Cook, 2007; Westfeld et al., 2005); fear of being judged by peers for seeking mental health

services (Cook, 2007); and concern about potential negative consequences resulting from disclosure (i.e., expulsion from school, forced hospitalization; Drum et al., 2009). The failure to seek professional help when needed is extremely unfortunate given that treatment often reduces the likelihood that students will act on their thoughts of suicide (Drum et al., 2009). Therefore, in their efforts to prevent suicide, colleges face the challenge of empowering suicidal students to seek help at college counseling centers before they act on their suicidal thoughts.

Gatekeeper trainings, designed for those individuals who are in regular contact with students (i.e., resident assistants, fellow students, administrators, faculty, and staff), have become one of the most popular suicide prevention programs. Indeed, gatekeeper trainings have been a focus of funding for the Garrett Lee Smith Memorial Act, which provides funding for 74 college campuses to further suicide prevention efforts (Goldston et al., 2010). Gatekeepers are trained to recognize a crisis and suicide warning signs among students and, most importantly, to refer the students for treatment (Centers for Disease Control and Prevention (CDC), 1992; Cross, Matthieu, Lezine, & Knox, 2010). Research suggests that gatekeeper training reduces stigma, improves knowledge of suicide warning signs and referral sources, increases intentions to help students, improves crisis communication skills (Botega et al, 2007; Chagnon, Houle, Marcoux & Renaud, 2001; Cimini et al., 2014; Cross et al., 2010; Pasco, Wallack, Sartin, & Dayton, 2012; Taub et al., 2013; Tompkins & Witt, 2009), increases number of referrals to professional help (Condron et al., 2015), and reduces suicide (Rozanov, Mokhovikov, & Stiliha, 2002).

While gatekeepers can be anyone in a college community, students are more easily identified by and more likely to report suicidal thoughts to peers (Cross, 2007; Drum et al., 2009; Wyman et al., 2008). Recognizing the value of peers as a primary source of student support in suicide prevention on college campuses, many colleges focus on training peers to be gatekeepers (Goldston et al., 2010). Research suggests that high school students (Wyman et al., 2010) and resident assistants (RAs; Cross et al., 2010; Pasco et al., 2012; Swanbrow Becker, 2013; Taub et al., 2013; Tompkins & Witt, 2009) show promise as peer gatekeepers in suicide prevention efforts. Though highly likely, studies have yet to examine whether students from the general college community (outside of those serving as RAs) can also serve as effective gatekeepers.

Though peer gatekeeper programs show great promise in suicide prevention efforts, constraints on the financial resources available to college counseling centers (Cooper, 2000) limit the number of students who can be trained as peer gatekeepers. Moreover, rapid turnover of students creates a challenge for sustaining suicide prevention programs based on peer support systems (Schwartz & Friedman, 2009). Therefore, efforts to identify those students who would emerge as the most effective peer gatekeepers (i.e., identify and refer at risk students) early in their college education would allow for a more targeted approach to recruitment and improve sustainability of gatekeeper programs.

The present study has two primary aims. The first is to examine whether a 1-hour peer gatekeeper training, offered to the general college student population, will lead to the identification and referral of suicidal individuals for help. The second aim is to examine whether various leadership and personality characteristics, drawn from a

prominent theory of leader attributes and performance (Zaccaro, Kemp, & Bader, 2004),

predict peer gatekeeper success (i.e., identification and referral of suicidal students)

among college students.

Below, I provide an overview of the various types of gatekeeper training

programs. Then I review literature on the effects of gatekeeper trainings on knowledge

and behavior across multiple settings (high schools, colleges, the workplace, hospitals,

and the military), including: 1) knowledge of and attitudes about suicide; 2) attainment of

gatekeeper skills and identification of individuals in crisis; 3) referral of students in crisis

to professionals; and 4) suicidal behaviors. I outline the importance of peer leaders in

suicide prevention programs on college campuses. I also discuss the need to identify and

train students with the greatest potential for effective gatekeeping to improve feasibility

and sustainability of these programs. I then review existing literature that examines

factors that predict effective gatekeeping as well as introduce characteristics that may

serve the same role from personnel selection literature. I conclude with study hypotheses,

namely that various leadership and personality traits may serve as strong yet unexplored

predictors of effective gatekeeping. These hypotheses are followed by an overview of

study methods.

Overview of Gatekeeper Training Programs

Gatekeeper training is one type of universal suicide prevention program. It is

designed to target three primary goals: 1) reduce risk factors for suicide; 2) increase

protective factors against suicide; and 3) promote early detection of a crisis and

utilization of existing mental health resources (CDC, 1992). Gatekeeper trainings vary in

length (1 to 8 ≥ hours), focus (increase knowledge, build crisis communication skills, facilitate referrals, safety planning), and target audience (peers, teachers, administrators, etc.). However, they all provide education and training in the recognition of individuals at risk for suicidal behaviors and appropriate action to reduce suicide risk (Gould & Kramer, 2001; Katz et al., 2013).

Since individuals at risk for suicide are more likely to seek help from *natural helpers* (i.e., individuals they come into contact with regularly) than from medical or mental healthcare professionals (Barnes, Ikeda, & Kresnow, 2001), training *natural helpers* as gatekeeper to identify and respond appropriately to distressed individuals may decrease suicide attempts and, subsequent, deaths (Rodgers, 2010). *Natural helpers* can include peers, parents, teachers, professors, school counselors, mental health professionals, administrators, and or anyone in a position to build relationships with at-risk individuals (Kalafat & Elias, 1995; U.S. Public Health Service, 1999). Gatekeeper trainings equip *natural helpers* with tools to provide support to and refer individuals in crisis for treatment based on either a *surveillance model* (i.e., an increase in gatekeepers' knowledge about suicidality will allow them to effectively identify, respond, and make appropriate referrals) or a *communication model* (i.e., the communication between suicidal individuals and gatekeepers fosters help seeking and, subsequently, referrals; Wyman et al., 2008).

The most commonly administered gatekeeper training programs include the Applied Suicide Intervention Skills (ASIST; 14 hour training; Living Works, Inc.; Rodgers, 2010), SafeTALK (3-8 hour training; Living Works, Inc., Rodgers, 2010),

Campus Connect (3 hour training), and Question, Persuade, Refer (QPR; 1-2 hour training; Quinnett, 1995; Quinnett, 2007). Although the ultimate goal of these gatekeeper trainings is to reduce suicide attempts and deaths, each program approaches this challenge in a slightly different way. QPR, SafeTALK, and Campus Connect teach a three-step process that includes the identification of individuals in crisis, brief intervention, and referral to appropriate resources. Generally, the programs teach these steps through didactic training (review of suicide statistics and warning signs) as well as experiential practice (role plays) to enhance sensitivity to and communication skills about the issue of suicide. Of these three trainings, SafeTALK and QPR emphasize the didactic training (*surveillance model*), whereas Campus Connect puts more emphasis on active listening and relationship building (*communication model*) to identify individuals in crisis. But all three programs emphasize referral of suicidal individuals for professional help (Pasco et al., 2012). Research has not identified the optimal manner of referral (e.g., giving referral, contacting appropriate individuals within the university, etc.).

ASIST, in contrast, de-emphasizes the importance of referring individuals to mental healthcare providers and trains gatekeepers in skills to help the individual manage their crisis. Specifically, ASIST trains gatekeepers to collaborate with suicidal individuals in developing safety plans designed to reduce suicide risk and connect the individual with a variety of community resources including, if indicated, mental health services. As ASIST trained gatekeepers are taught and repeatedly practice crisis intervention skills, they must complete a relatively long training over the course of 2 days (14 hours). QPR

(1-2 hours), Campus Connect (3 hours), and SafeTALK (3-8 hours) vary in length based on the amount of time devoted to experiential practice (i.e., role-plays).

Of these trainings, ASIST and QPR are most frequently used in secondary schools (Rodi et al., 2012). Campus Connect is one of the few nationally recognized gatekeeper training programs exclusively designed for college communities. However, QPR trainings are commonly administered on college campuses as well. In a review of gatekeeper training programs, Katz et al. (2013) indicates that QPR is effective at increasing knowledge and attitudes, but does not have an effect on behavioral outcomes such as asking students about suicide, connecting with students, or increasing number of referrals. Research suggests that relatively longer trainings, such as that offered through ASIST, do lead to a greater number of referrals for suicidal youths, relative to shorter trainings (Condron et al., 2015). Generally, across programs, ample research has explored the general effectiveness of training on knowledge acquisition, attitude change, and crisis communication skill enhancement. However, less is known about the effects of gatekeeper training on referral patterns and reduction in suicidal behavior (e.g., Isaac et al., 2009).

Research Supporting Effectiveness of Gatekeeper Training
Gatekeeper trainings have been implemented to promote suicide prevention in higher education (Cimini et al., 2014; Cross et al.; 2010; Indelicato et al., 2011; Pasco et al., 2012; Taub et al., 2013, 2011; Tompkins & Witt, 2009), secondary schools (Cross et al, 2011; Condron et al., 2015; Gould, Greenberg, Velting, & Shaffer, 2003; Tompkins, Witt, & Abraibesh, 2009; Wyman et al. 2008; 2010), with native peoples (Capp, Deane,

& Lampert, 2001), veterans (Matthieu, Cross, Batres, Flora, & Knox, 2008), active duty

military (Rozanov, Mokhovikov, & Stiliha, 2002), places of worship (Molock, Matlin,

Barksdale, Puri, & Lyles, 2008), senior living communities (Walker & Osgood, 2000),

and workplaces (Cross, Matthieu, Cerel, & Knox, 2007). As will be reviewed in detail

below, studies have examined the effect of gatekeeper training on: 1) changes in

knowledge and attitudes; 2) attainment of gatekeeper skills; 3) identification of

individuals in crisis; 4) referrals to mental health professionals; 5) impact on actual

suicidal behavior; and 6) retention of knowledge and skill.

Changes in knowledge and attitudes

Uncontrolled and controlled studies have demonstrated significant improvements

in declarative knowledge (i.e., suicide warning signs and intervention behaviors) and

attitudes (i.e., beliefs about suicide, self-perceived knowledge and efficacy around suicide

related topics) among individuals across settings (e.g., secondary schools, colleges,

hospitals) after they engage in gatekeeper trainings (Cross et al., 2007; Goldsmith et al.,

2002; Grossman & Kruesi, 2000; Indelicato et al., 2011; Jacobson, Osteen, Sharpe, &

Pastoor, 2012; Keller et al., 2009; Matthieu et al., 2008; Sharpe, Frey, Osteen, & Bernes,

2014; Tompkins et al., 2009; Wyman et al., 2008). In college settings specifically, Cross

and colleagues (2010) found a significant increase in declarative knowledge ($11.30 \pm$

1.25 vs. 9.5 ± 1.49; t=8.07, p< .001) and perceived self-efficacy ($2.88 \pm .69$ vs. 1.74

±1.00; t=10.396, p< .001) among RAs, faculty, facilities workers, student affairs staff,

and coaches across 5 universities in the United States following engagement in a 1-hour

gatekeeper training. Through a case study, Cimini and colleagues (2014) found a similar

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increase in self-reported knowledge and comfort in talking about suicide for faculty/staff

and student groups after they completed an audience specific (i.e., English professors

learned how to detect suicide warning signs in essays), single-session, small-group

interactive gatekeeper training program delivered by campus counseling center service

providers at a large public university in the northeastern United States. Generally, data

suggest that didactic training improves knowledge and attitudes over time (Keller et al.,

2009; Tomkins et al, 2009; Wyman et al., 2008), with no additional benefit of practice of

gatekeeper skills on knowledge or attitude outcomes (Cross et al., 2011).

Attainment of gatekeeper skills

While incorporating role plays into the training does not appear to make a

difference in knowledge or attitude outcomes, role plays may affect participants' ability

to engage in crisis (Pasco et al., 2012) and gatekeeper skills with suicidal individuals

(Cross et al., 2011; Taub et al., 2013). A number of studies have shown that role-plays

designed to help participants practice gatekeeper skills in the context of trainings leads to:

1) increases in participants' self-reported comfort talking to distressed students on college

campuses (faculty/staff and student groups; Cimini et al., 2014) and in secondary schools

(school personnel and parents; Cross et al., 2011); 2) higher perceived self-efficacy

related to crisis intervention skills (first year RAs; Pasco, et al., 2012); and 3) greater

perceived preparedness and intention to refer students for professional help (RAs; Taub et

al., 2013).

A few studies have been conducted to specifically compare the effects of

gatekeeper trainings with and without behavioral rehearsal (role-plays). One study found

that RAs (resident assistants) who engaged in a 1-hour QPR training with behavioral

rehearsal reported increases in their enactment of key gatekeeper behaviors (e.g., asking

peers about suicidal thoughts, convincing peers to seek help, taking peers to a counselor),

while those who participated in trainings without behavioral rehearsal did not (Tompkins

& Witt, 2009). In a second study, Cross and colleagues (2011) conducted a randomized

controlled study to compare gatekeeper training- as-usual (i.e., delivery of didactic

information only with question and answer period) with and without the addition of

behavioral rehearsal in a sample of secondary school personnel (mental health

professionals, teachers/aides/administrators, bus drivers) and parents. They found that

participants in the training with behavioral rehearsal condition scored significantly better

on an observation measure of gatekeeper skills than those in the training-as-usual only

condition. These data suggest that behavioral rehearsal is an important part of gatekeeper

trainings.

Identification of individuals in crisis

Relatively fewer studies have examined the impact of gatekeeper trainings on

actual identification of individuals in crisis. Those that have suggest that gatekeeper

trainings are effective at increasing direct questioning about suicide and in facilitating

identification of individuals who may have engaged in or are at risk for suicidal behaviors

(Condron et al., 2015; Rodi et al., 2012; Wyman et al., 2008; 2010). For example, one

study conducted in secondary schools found that staff members who engaged in

gatekeeper training reported asking more students about suicide post than pre-training

(one more student per every four trained staff members; Wyman et al., 2008). These

findings are encouraging given that questioning students can lead to increases in the identification of those at risk for suicide. Indeed, Garrett Lee Smith grantee-trained gatekeepers in secondary schools identified 1,109 youth they considered at risk for suicide (each site provided a median of 20 youth identified; Rodi et al., 2012). Similarly, peers trained as gatekeepers in high schools were found to be more effective at identifying fellow students in crisis than those who were not trained (Wyman et al., 2010).

Only one study to date has investigated the impact of behavior rehearsal during training on actual identification of individuals in crisis. This study compared QPR (1 hour), SafeTALK (3 hour) and ASIST (more than 8 hours) administered in secondary schools and found that participants in the shortest gatekeeper training (QPR) that included less rehearsal of skills identified fewer than one youth on average, whereas those who attended longer trainings (more than 8 hours) identified more than one youth on average, over the course of three months (Condron et al., 2015). While these results are not conclusive on the effects of incorporating role-plays on identification, they suggest that increased time to practice skills during training positively affects identification rates.

Impact of training on referrals

Most of the studies that have examined the impact of gatekeeper trainings on referrals of at-risk individuals were conducted in secondary schools. Generally, these studies suggest that gatekeeper trainings increase the number of referrals of at risk students for professional help (Condron et al., 2015; Rodi et al., 2012; Wyman et al.,

2010). Peer based programs appear to increase the odds of a peer referring a fellow student in crisis to an adult for help. In one study, according to peer gatekeepers' self-reports, the odds of a peer referring a fellow student in crisis was 4.12 times greater in schools where students completed the gatekeeper training relative to schools without this training (Wyman et al., 2010). Adults trained as gatekeepers in secondary schools are also more likely than untrained school personnel to refer suicidal students to mental healthcare services (Rodi et al., 2012). Thus, peers *and* adults trained as gatekeepers in secondary schools help to identify and connect at risk students with needed care. Interestingly, some data suggest that didactic training alone may lead to increases in self-reported referrals with no added benefit of behavioral rehearsal (Cross et al., 2011).

While research suggests that gatekeeper trainings directed at peers and adults in secondary schools increases referral of at risk students, research into the impact of gatekeepers on referrals of college students is more limited. Using a small group based gatekeeper training program, Cimini and colleagues (2014) found that 19% of faculty, staff, and students participating in the training reported talking to at risk students about suicidal thoughts and behaviors after training. Cross et al. (2010) reported that 54% of university RAs, faculty, and staff who participated in QPR training demonstrated an ability to make an adequate referral for help during a post training role-play evaluation. Given that up to half of trained gatekeepers may not demonstrate the ability to make adequate referrals post-training and even fewer make referrals for at risk-individuals, research is needed to examine factors that differentiate those who may serve as effective

versus ineffective gatekeepers. This is particularly important on college campuses where financial resources for gatekeeper trainings are often very limited.

Decrease in suicidal behaviors

To date, only two studies (Rozanov et al., 2002; Wyman et al., 2010) have reported on the effectiveness of gatekeeper training programs on reduction of suicidal behaviors (i.e., suicidal ideation, attempts, and completions), and only one of them suggests that gatekeeper trainings help to reduce suicidal behaviors. Regarding suicidal ideation, Wyman et al. (2010) found a reduction in rates of suicidal ideation between baseline and 3-month follow-up among youth in schools that received gatekeeper training (8.8% to 4.38%). However, these reductions were not significantly different from those reported by students in schools that did not receive the training. The authors note that this lack of difference may have been due to substantial variation in baseline rates of suicidal ideation across the 18 schools included in the study (0.5%-23.4%).

Rozanov and colleagues (2002) examined the impact of gatekeeper training programs on number of suicides in the Ukrainian Army. The authors administered a modular training program to peers and supervisors in the army (i.e., soldiers, officers, warrants, sergeants) and professionals in helping roles (i.e., chaplains, psychologists, social works, medical personnel). Multiple trainings were scheduled over the course of 4 months. The average suicide rate dropped from an average of 74.7 suicides in the year before the program to zero in the first year of the program's implementation. However, in the second year, the suicide rate increased to an average of 16.7 suicides, a rate that was still lower than in the year before the program's implementation. These data suggest that

gatekeeper trainings may need to be done at least annually to maintain their effects. Moreover, they highlight the importance of assessing gatekeepers' knowledge and skill retention when examining gatekeeper effectiveness.

Retention of knowledge and skills

Knowledge is necessary for gatekeepers to appropriately identify suicidal individuals and execute skills to facilitate a successful referral. Research into how long gatekeepers retain and are able to use the information and skills learned during gatekeeper trainings is limited. There exists evidence to suggest that knowledge about suicide facts may deplete over time (Cimini et al., 2014; Tompkins et al., 2009). One potential solution to improve retention of gatekeeper knowledge, attitudes, and skill is to offer booster sessions. However, only one study examined the effect of a 30-minute booster session held a few months after gatekeeper training (relative to no booster session), and found that the booster session did not improve retention of knowledge, attitudes, and skill acquisition at one-year follow-up (Wyman et al., 2008). Thus, the efficacy of booster sessions as well as optimal duration and timing requires further study.

Importance of Peer Leaders in Suicide Prevention on College Campuses

Though limitations exist, gatekeeper trainings do show promise in suicide prevention efforts. Individuals are trained as gatekeepers in a wide variety of settings (i.e., colleges, secondary schools, workplaces, military, hospitals). These trainings may be particularly useful for peers on college campuses where students face heightened suicide risk during the challenging transition from high school to college (i.e., adolescence to young-adulthood) and often reach out to their peers for help. During this

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transition, students leave the support of family and high school friends and are exposed to circumstances (i.e., moving away from home, pressure to integrate into new social groups, adjusting to a college roommate) and expectations (i.e., increased autonomy, academic achievement) that place them at heightened risk for developing psychiatric disorders and exacerbation of pre-existing problems (Cleary, Walter, & Jackson, 2011), including suicidal thoughts and behaviors (Bayram & Bilgel, 2008).

As thoughts of suicide increase, college students are more likely to conceal their feelings (Stewart, 2008). Indeed, one study found that 46% of undergraduate students surveyed nationwide did not tell anyone about their suicidal thoughts (Drum et al. 2009). College students' apparent reluctance to seek support when they are in crisis corresponds with developmental theory. Specifically, as adolescents move toward autonomy, they rely less on adults, such as parents and professionals (*Erik Erikson's Theory of Development*; Muuss, 1995), for advice and support. Although college students may prefer self-sufficiency, they still require support. Receipt of support from others has been shown to increase resilience in the face of stress (Davino, 2013).

As a result of their growing autonomy from adults, mistrust of adult helpers, and confidence in peers (Gould et al., 2003; Kalafat & Elias, 1995; Kalafat & Elias, 1994; Lewis & Lewis, 1996; Wyman et al., 2008), college students increasingly seek support from their peers. According to research, students are more easily identified by and are more likely to report suicidal thoughts to peers (Cross, 2007; Drum et al., 2009; Wyman et al., 2008). Of the 54% of students who did share their suicidal thoughts in the aforementioned study, two-thirds turned to peers such as partners, roommates, and

friends (Drum et al., 2009). However, another study found that 29% of college students from a national sample who reached out to peers for support did not find the support that they received to be helpful (Biro, Roza, & Kosa, 2011). Thus, while peer support can reduce mental health issues among college students, including suicidal ideation, (Stewart, 2008), peers may not be equipped with the skills needed to support one another most effectively.

The fact that some suicidal college students fail to find peers to be helpful may be due, in part, to the tendency among peers to focus on solving fellow students' problems instead of suggesting that they seek professional help (Barton, Hirsch, and Lovejoy, 2014). In fact, one study found that only 58% of students who confided in peers were advised to seek professional help (Drum et al., 2009). Gatekeeper trainings may provide peers with the skills they need to offer adequate support. Through gatekeeper trainings, peers gain the skills necessary to offer effective low-level intervention, recognize when the crisis exceeds their capacity to assist, and facilitate help seeking behaviors among students contemplating suicide. On a more global level, they may also help to decrease concealment of suicidal ideation, improve detection of suicidal students, increase perceptions of peer support among suicidal students, and offer a personalized referral process (Swanbrow Becker, 2013).

Cost to college counseling centers

While the potential importance of training peers as gatekeepers on college campuses is highly evident, there exist numerous barriers to these efforts. Within colleges, counseling centers are tasked with training gatekeepers. Currently, these centers

face the challenge of balancing dwindling resources with increased demands for services. Moreover, students who seek these services present with increasingly severe psychopathology (Cooper, 2000), and colleges place significant pressure on counseling centers to help these students stay in school (Sharkin, 2011). Thus, a sizable portion of resources are allocated toward treating serious mental illness, leaving counseling centers with limited funds for gatekeeper trainings. Training staff members to administer gatekeeper trainings costs counseling centers up to $4500 per staff member ("Suicide Prevention and Training Programs for College Campuses," n.d.). This cost significantly limits the number of staff members that can be trained and thus the number of trainings that can be offered. Further, with an increase in demands for services, counseling center staff having very little time in their schedules to assume additional responsibilities (Gallagher, 2014) such as gatekeeper trainings.

Many college counseling centers have financed gatekeeper trainings on their campuses through funds awarded by the Garrett Lee Smith Suicide Prevention Grants (ICF Macro, 2009). However, they all face the question of how to maintain the program after funding stops. One option to address this concern is to implement "train the trainer programs" but this would require that others across the college (faculty, staff, advanced graduate students), with less or no clinical training/experience, are willing and able to volunteer their time for this purpose, which is not highly probable or optimal. Another option is to limit the number of trainings offered and focus only on those students who are likely to be most effective as gatekeepers. However, little is known about characteristics of individuals who may learn and retain most from gatekeeper training or

apply their knowledge to identify and refer students at risk for suicidal behavior. In the next section, I will provide an overview of the limited research on potential predictors of gatekeeper success.

Broadly, research suggests that gatekeeper training programs foster increases in relevant knowledge and desired attitudes about suicide, as well as crisis communication skills, across a variety of settings. Further, gatekeepers may increase referrals of at risk individuals to mental healthcare professionals and, as a result, save lives. These findings, and those confirming the value of peer support, suggest that peer gatekeeper training may be critical to the prevention of suicide among college students. Despite this promise, more research is needed to examine the impact of training, especially training of peers as gatekeepers, on the identification and referral of suicidal students on college campuses. Identification and referrals of suicidal students will be dependent on a gatekeeper's ability to be proactive in talking to students who need help and to help when approaching students in crisis. In addition, since gatekeeper training programs are costly, identification of factors and characteristics that predict gatekeeper success is immensely important to the sustainability of these programs.

Predicting Effective Gatekeepers

When selecting individuals to train as gatekeepers, it will be important to identify: 1) those who learn the most from gatekeeper trainings; and 2) those who possess characteristics that promote effective gatekeeper behavior (i.e., identification and referral of students in crisis). Below, I review existing literature in these areas. I also offer a

rationale for a focus on the examination of leadership traits and qualities as predictors of effective gatekeeping, an area that has not yet been investigated but holds promise.

Who learns most from training?

Research that examines gains obtained during gatekeeper training has been conducted across various types of students and staff from college (Cimini et al., 2014; Cross et al., 2010; Taub et al., 2013), Veterans Administration (VA) hospital (Mattheiu et al., 2008), and secondary school (Tompkins et al., 2009; Wyman et al., 2008; 2010) settings. In high schools, gatekeeper training led to the greatest gains for students who: did not usually offer support to suicidal peers; followed codes of silence (i.e., kept as secret) for discussions about suicide; and demonstrated inadequate coping methods when faced with their own problems or someone else's (Wyman et al., 2010). Other studies suggest that trainings increase self-efficacy and knowledge of suicide or suicide specific skills among those who have little to no clinical training and/or experience with suicide prevention but not those with clinic training and/or prior experience (Cross et al., 2010; Matthieu et al., 2008; Tompkins et al., 2009). For example, Matthieu and colleagues (2008) found training had a greater impact among non-clinical staff self-efficacy and perceived suicide related knowledge at the VA hospital. They also found that the training did not increase the self-efficacy or knowledge of clinically trained staff beyond what they had acquired before the training. On college campuses, new RAs without (versus with) prior training showed greater improvement in crisis communication skills and suicidal knowledge as a result of training (Taub et al., 2013). Based on these data, counseling centers would be prudent to recruit and train individuals without previous

suicide prevention training or clinical experience with suicidal individuals (i.e., untrained school personnel and peers). Those with prior clinical/suicide prevention experience may already have adequate knowledge and skills needed to identify and refer those in need and may not gain additional benefits from the training. Thus, training these individuals would not add to the pool of individuals across the college campus able to identify and refer suicidal youth for help.

While non-clinically trained individuals appear to learn most from participating in training, secondary school personnel and parents with previous exposure to suicide (prior contact with someone who was suicidal and participation in previous suicide prevention training; Cross et al., 2011) and mental healthcare professionals are still more likely to identify and refer suicidal students (Condron et al., 2015). This may suggest that these sets of individuals already possess knowledge of suicide prevention via prior experience/training and are more comfortable in the gatekeeper role relative to those who are newly trained. Further, youth referred by mental healthcare professionals in schools may be more likely to receive services than those referred by other sources (e.g., teachers, peers, caregivers, etc.; Rodi et al., 2012; Condron et al., 2015), likely due to mental health professionals' greater knowledge of the mental health system.

These studies establish that knowledge about suicide prevention and the mental health referral process, as well as comfort and skill in approaching at-risk students to make a referral, are key elements to effective gatekeeping. Given that individuals with this background already identify youth and make referrals, it seems logical to focus on training new individuals without this knowledge and skill set to increase the pool of

individuals who can identify and refer at risk individuals. This, in turn, may increase the number of at-risk students identified and referred for help potentially resulting in less loss of life. Thus, training college students from the broader college community may prove to be a fruitful avenue to pursue.

Characteristics predicting gatekeeper effectiveness

Generally, individuals most likely to serve as effective gatekeepers probably include those: who are open to learning new ways of thinking about suicide (i.e., adopt new attitudes); can manage stress associated with gatekeeping responsibilities; possess the intellectual and socio-emotional ability to identify and help individuals in crisis; and are willing to refer an individual in crisis for help. To date, research on characteristics associated with effective gatekeeping in these areas has been conducted with RAs and combined groups of students, faculty, and staff on college campuses (Cimini et al., 2014; Swanbrow Becker, 2013), employees in the work place (Moore et al., 2011), and staff and students in secondary schools (Wyman, 2008; 2010). According to these studies, those who possess adequate social support (Moore et al., 2011; Swanbrow Becker, 2013), report comfort talking to suicidal individuals (Cimini et al., 2014), and are in positions that facilitate communication with suicidal individuals (i.e., counseling staff, guidance counselors; Condron et al., 2015; Wyman et al., 2008) are most likely to experience positive shifts in attitudes about suicide and an increase in resistance to stress associated gatekeeper responsibilities (i.e., identification and referral suicidal individuals) following gatekeeper training. A study conducted in secondary schools also suggests that younger (relative to older) school personnel as well as teachers and administrators (relative to

support staff) demonstrate more positive shifts in attitude towards identifying suicidal youth over time. In fact, support staff showed negative shifts in beliefs about addressing the problem of youth suicide post-gatekeeper training in one study (Tompkins et al., 2009). Among trained peer gatekeepers in secondary schools, those who held the beliefs that *suicide is not a way to solve problems* and *adults can help suicidal students* were more likely to refer suicidal teens to appropriate school staff for help after training (Wyman et al., 2010).

Helping students in crisis can be stressful. Resilience to stress associated with gatekeeping is particularly important to gatekeeper effectiveness, especially on a college campus where over 50% of university students report an increase in depressive symptoms after starting college (Furr, Westefeld, McConnell & Jenkins, 2001). Generally, data suggest that students with existing mental health difficulties may be least resilient (e.g., Swanbrow Becker, 2013) and thus may be a poor choice when selecting students to train as gatekeepers. Studies conducted with RAs on college campuses, who tend to be relatively healthier than the broad student body, suggest that willingness to reach out for social support when needed, feelings of belongingness to their community of fellow RAs, the belief that RAs as a group were responsible for preventing suicide, and higher perceived competency after completing gatekeeper training, buffered the RAs from gatekeeper related stress (Swanbrow Becker, 2013). Further research is needed to determine whether mental health difficulties affect gatekeeper performance.

Some research has also examined factors associated with gatekeeper ability to identify individuals at risk. Individuals who are more comfortable talking to students in

crisis about suicide (Cimini et al., 2014), spend substantial time interacting with youth, and/or are already having conversations about suicide with students at risk (Condron et al., 2015; Wyman et al., 2008) are more likely to identify suicidal students and ask them directly about suicidal thoughts. Interestingly, one study also found that youth identified and referred by adult male gatekeepers in secondary schools are more likely to receive the services than if they are referred by females (Condron et al., 2015). This is a puzzling finding that Condron and colleagues asserted should be replicated in future studies. Data also suggest that perception of support from employers and supervisors in the workplace (Moore et al., 2011) increase gatekeepers' ability to reach out to and identify suicidal individuals.

Though much less well studied, personality traits may also be predictive of positive performance among gatekeepers (Salgado, 1997). To date, only one study has investigated the role of personality characteristics in predicting gatekeeper success on college campuses (Cross et al., 2010). Cross and colleagues (2010) examined *openness to experience*, a personality characteristic shown in previous studies to be related to new learning and behaviors (Barrick & Mount, 1991), as a predictor of enhanced skills among college RAs, faculty and staff trained as gatekeepers. Interestingly, they found that greater *openness to experience* at baseline did not predict enhanced skills at follow-up. Given multiple study limitations, Cross et al. (2010) recommended that these findings be interpreted cautiously and require replication.

To date, no studies have investigated factors that predict gatekeeper effectiveness exclusively among students trained as peer gatekeepers in college. Theory driven

research focused on the identification of college students who will make the most effective gatekeepers, may help to improve suicide prevention efforts on college campuses.

Given that peer gatekeepers have been shown to serve a leadership role in suicide prevention efforts in high schools by identifying and referring suicidal students to adults for help (Wyman et al., 2010), the same is likely to be true on college campuses where various types of peer leadership programs have fostered a stronger sense of community and well-being among undergraduates (e.g., Shook & Keup, 2012). Leadership is considered "a process of motivating people to work together collaboratively to accomplish great things" (Vroom, 2007, p. 18). Suicidal individuals often feel isolated and alone and view death as the only solution to their problems. Gatekeepers, as peer leaders, motivate suicidal individuals to seek professional help to contemplate other solutions (e.g., living) to their problems - they motivate collaboration to accomplish great things. Thus, leadership models may help inform decisions about effective peer gatekeepers who are equipped with the personal attributes and skills to identify and, then, to assist suicidal students in obtaining help from mental healthcare professionals.

Theoretically Based Predictors of Leader Effectiveness

Zaccaro, Kemp, and Bader's (2004) *Model of Leader Attributes and Leader Performance* may be particularly relevant because this theory specifies a series of distal and proximal traits that underlie a leader's capability to recognize issues and respond appropriately (Kenny & Zaccaro, 1983) and, thus, to emerge as an effective leader. According to this model, an individual's distal traits influence the development of one's

proximal traits, which in turn, influences leadership processes and outcomes. Distal traits, which include cognitive abilities (intelligence), personality characteristics (extraversion, agreeableness, conscientiousness, emotional stability, openness), and motives for performance (motivation to lead), are considered stable across time and situation. On the other hand, proximal traits (i.e., social appraisal skills, problem solving competencies, expertise, and tacit knowledge) are variable, developing over time through an individual's encounters with different situations. Zaccaro et al. (2004) acknowledge that each predictor of leader effectiveness within the distal and proximal attributes operates jointly and contributes more or less based on the context (i.e., leaders operating environment; Zaccaro & Klimoski, 2001).

One study has tested Zaccaro et al. (2004)'s full model, though it was modified slightly (i.e., sense-making was added to the proximal traits included in the model). Young (2010) attempted to predict leader effectiveness among school principals in South Carolina but found that this modified model did not provide a good fit to the data. However, this study had multiple notable limitations including: 1) a reliance on principals' self-report of perceived effectiveness; and 2) lack of empirically validated measures to assess any of the study constructs. The authors created their own scales and asked principles to rate their own perceived abilities (e.g., motives and values, social and problem solving skills, and tacit knowledge).

A model similar to Zaccaro and colleagues' (2004) has also been put forth by Mumford, Zaccaro, Harding, Jacobs, & Fleishman (2000). Mumford and colleagues hypothesized that skill (i.e., complex problem solving, social judgment) and knowledge

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development are largely influenced by an individual's traits (i.e., cognitive ability, personality, motivation), and that skills and knowledge have a direct impact on leader performance (i.e., traits lead to the development of skills that, in turn, increase leader performance). Problem solving, knowledge acquisition, and social skills are central to this model, as leaders must be able to define problems, gather information, and use this knowledge to develop effective solutions. They must also be socially adept to adequately motivate others to work with them towards the solution.

One study has found support for Mumford et al.'s (2000) full model. Connelly et al. (2000) found that complex problem solving skills, social judgment, and leader knowledge partially mediated the relationship between cognitive abilities, motivation, and personality, and leader achievement in a sample of commissioned Army Officers. They also found that complex problem solving skills (β =.48), social judgment (β=.26), and leader knowledge (β=.19) significantly predicted leader achievement, even above and beyond cognitive ability, motivation, and personality.

Not captured in Mumford et al. (2000)'s model, though central to Zaccaro et al. (2004)'s, is the idea that different traits and skills may hold different weight across various contexts (Zaccaro & Klimoski, 2001). Further, this model suggests that a leader's operating environment determines the emergence of skills and knowledge. Unlike most leaders who work in organizations that operate under a clear hierarchy of leaders and subordinates, peer gatekeepers operate in social groups on college campuses with little to no authority over one another. In addition, gatekeepers have to act quickly in emotionally charged situations as they respond to peers in distress within social settings. As suggested

by Zaccaro et al.'s model, a gatekeeper's unique operating environment is important to take into consideration when attempting to identify traits and abilities that contribute to effective gatekeeping. Zaccaro's model also includes many of the individual traits and abilities that predict leader emergence (Ferentinos, 1996), as well as academic and social success (Harackiewicz, Barron, Tauer, & Elliot, 2002; Kitsantas, Winsler, & Hule, 2008) in college, and thus may be most readily applied to the prediction of effective peer gatekeeping on college campuses.

In the present study, I will examine whether the same constructs included in this model can be used to predict effective peer gatekeeping behavior (e.g., identification and referral of suicidal peers). Please see Figure 1 for a diagram of this model. In the following sections I review research that supports the association between the distal (cognitive ability, personality, motivation) and proximal (problem solving skills, social appraisal skills, knowledge) traits included in Zaccaro's et al. (2004)'s model of leader effectiveness.

Distal Traits of Gatekeeper Effectiveness

Cognitive Ability

Cognitive ability (intelligence) is a broad mental capacity that involves the ability to understand and manage a series of complex ideas in order to solve problems (Schmidt & Hunter, 2000). To be effective, leaders must possess the mental capacity to gather, integrate, and interpret information (e.g., facts, feelings, behaviors) and, then make contextually appropriate decisions. Consequently, intelligence is the personal characteristic with the largest positive correlation with leadership qualities (e.g., leader

emergence, leader effectiveness) in a variety of populations (e.g., Zaccaro et al., 2004; Connelly et al., 2000), including undergraduate college students (Ferentinos, 1996).

Many studies have established the relationship between cognitive ability and leadership. Lord, De Vader, and Alliger (1986) used meta-analytic techniques to reanalyze data reported in an earlier review by Mann (1959) and found a positive correlation between leadership ratings and intelligence (.50). More specifically, Judge, Colbert, & Ilies (2004) explored the relationship between cognitive ability and leader effectiveness through a meta-analysis and discovered correlations ranging from 0.17 to 0.33, suggesting that individuals with higher cognitive ability are more effective leaders among samples of students as well as business and military leaders.

In their role as leaders in the suicide prevention efforts on college campuses, peer gatekeepers must be able to process and retain information imparted to them in the 1-hour gatekeeper training. Later, they must be able to apply what they learned to identify a suicidal individual and, if appropriate to the situation, connect the individual with a resource in the community that will help to save the individual's life. They must possess adequate cognitive ability to successfully complete these tasks. *Thus, I hypothesize that gatekeepers who demonstrate higher cognitive ability will make more identifications and referrals of at risk individuals (Hypothesis 1).*

Personality

Research on personality traits that predict leader performance has focused primarily on the Big Five Model, a taxonomy that consolidates personality characteristics into five traits – extraversion, agreeableness, conscientiousness, openness to experiences

and neuroticism (i.e., emotional instability). The Big Five Model explains 28% of the variability in leader emergence and 15% of the variability in leader effectiveness (Costa & McCrae, 1992). Of the five traits in the Big Five Model, extraversion and conscientiousness have been proven the most relevant to leader performance (e.g., Judge et al., 2002; Ng et al., 2008). Judge and colleagues examined 78 studies that linked one or more of the Big Five factors to leadership and found that extroversion (.31) exhibited the strongest relationship to leadership, followed by conscientiousness (.28). In addition, they found extraversion to be the most consistent correlate of leadership across settings (i.e. business, government, military, primary and secondary schools) and leadership criteria (i.e., leader effectiveness and emergence). Extraversion may even predict adult workplace leader emergence above and beyond intelligence (Reichard, Riggio, Guerin, Oliver, Gottfried, & Gottfried, 2011).

Extraverts enjoy engaging with others socially and are perceived as energetic and outgoing (Costa & McCrae, 1989). Gatekeepers are operating in a social context that requires social engagement. Therefore, extraversion may be an asset. Peer gatekeepers must be willing to approach individuals in crisis to ask them direct questions about suicide, gather information, and then, respond to suicidal individuals in a way that makes them feel understood as opposed to judged. If a gatekeeper is able to engage a suicidal individual in crisis communication, he/she will increase the likelihood of identifying individuals who need help and ensuring that they receive it. In order to be able to accomplish these behavioral goals, effective gatekeepers will likely need to possess qualities of extraversion.

While extraversion seems to be the strongest predictor of leader effectiveness, Ng and colleagues (2008) suggest that attributes contributing to leader effectiveness are context specific and vary across settings. "Leaders must be tirelessly persistent in their activities and follow through with their program" in order to be effective" (Locke, 1991, p. 51). As a result of this requirement, conscientiousness seems to be critical to leader effectiveness. In fact, conscientiousness has a notable direct effect on leader performance among non-commissioned officers (.25; Van Iddekinge et al., 2009). In addition, conscientious individuals outperform extraverts in settings where leaders have greater autonomy (Ng et al., 2008).

Conscientious individuals are more likely to seek out trainings, complete assignments that enhance their job relevant knowledge and skills (Borman et al., 1991), and persist with a challenging problem to emerge as effective leaders. Gatekeepers need these qualities to obtain knowledge from the 1-hour training and employ their skills and knowledge to identify and refer suicidal peers. Conscientiousness may be particularly important to a gatekeeper when he/she encounters ambiguity and has to make the decision about whether to persist in a conversation with a potentially at-risk individual to gather additional information to determine whether referral is necessary or leave as is and assume that no services are needed.

Therefore, I propose the following hypotheses about the relationship between personality and leadership effectiveness among gatekeepers: *Gatekeepers with higher scores on extraversion will demonstrate higher levels of identifications and referrals*

(Hypothesis 2); Gatekeepers with higher scores on conscientiousness will demonstrate

higher levels of identification and referrals (Hypothesis 3).

Motivation

"Motivation is the combined effect of the choice to expend effort, the choice of level of effort to expend, and the choice to persist in the expenditure of that level of effort" toward a goal (Van Iddekinge et al., 2009, p. 465). Achieving benefits associated with leadership (i.e., power, achievement, affiliation) drives a leader's choice to expend effort towards being an effective leader. Leadership literature, based primarily on studies conducted in business or military settings, suggests that leaders with greater motivation for power, for achievement, for affiliation, and for responsibility to lead demonstrate superior leadership performance (House, Spangler & Woycke, 1991; Chan & Drasgrow, 2001; Deluga, 1998). Zaccaro et al. (2004) refer to this type of "motivation to lead" in their model.

A gatekeeper's choice to strive toward effective peer leadership may be driven more by the intrinsic desire to help others (i.e., save lives) than by other motivations cited in the leadership literature (i.e., to lead, achieve, obtain power). Indeed, research suggests that the promise of connection with and service to community predicts high school students' willingness to contribute to and engage in leadership activities (Lizzio, Dempster, & Neumann, 2010). Therefore, *I hypothesize that students who are more intrinsically motivated to become gatekeepers for the purpose of helping others will be more likely to identify and refer suicidal students than students with other primary motivations (e.g., gain course credit) (Hypothesis 4).*

Proximal Traits Mediate the Effect of Distal Traits on Gatekeeper Effectiveness

Leadership is a complex phenomenon. The pathway to leader effectiveness from cognitive abilities, personality, and motivation may not be direct. Instead, this association may be mediated by other individual attributes (Van Iddekinge et al., 2009; Zaccaro et al., 2004). Research has shown that cognitive abilities, positive personality traits, and proactive motivations lead to the development of effective leaders via more proximal attributes such as knowledge, problem solving skills, and social judgment (Borman, Hanson, Oppler, Pulakos, & White, 1993; Connelly et al., 2000; Mumford et al., 2000). For example, the primary way in which cognitive ability affects performance is through the acquisition and retention of knowledge (Schmidt et al., 1986) as well as the development of strong social and problem solving skills (Borman et al., 1993).

With regard to gatekeepers in particular, they must use knowledge acquired through gatekeeper training, as well as social appraisal (i.e., social intelligence) and problem solving skills, to process and understand the feeling, thoughts, and behaviors of their peers. They must then match their responses and decisions to best fit the contingencies and dynamics of the problem at hand (i.e., identifying a suicidal individual and guiding him/her to the appropriate professional resource; see Gatekeeper Decision Tree in Appendix B). A gatekeeper's success is dependent on the efficient and effective use of social appraisal and problem-solving skills.

In this section I will outline research supporting the mediating role that proximal traits (i.e., social and problem solving skills, knowledge) may play in the association

between cognitive abilities, positive personality traits (extraversion, conscientiousness), and intrinsic motivation to help others, and effective peer gatekeeping behavior.

Social and Emotional Intelligence

Social appraisal skills (i.e., social intelligence) refer to the "ability to understand the feelings, thoughts, and behaviors of persons, including oneself, in interpersonal situations and to act appropriately upon that understanding" (Marlowe, 1986, p. 52). Such skills are central to leadership, as leaders must regularly interact with and motivate others. Indeed, in support of their leadership model, Zaccaro and colleagues (2004) cite multiple studies that demonstrate strong evidence, across different samples and methods, to support an association between social intelligence and effective leadership.

Relatedly, emotional intelligence, "a subset of social intelligence that involves the ability to monitor one's own and other's feelings and emotions, discriminate among them, and use this to guide one's thinking and actions" (Salovey & Mayer, 1990, p. 189), has also been linked to effective leadership (e.g., Higgs & Aitken, 2003; Wong & Law, 2002). Emotional intelligence appears to be particularly helpful to leaders in the successful management of their own as well as their subordinates' emotions (Wong & Law, 2002). Emotional intelligence is also positively associated with cognitive ability (Cote & Miners, 2006; Ono, Sachau, Deal, Englert & Taylor, 2011), and positive personality traits (e.g., extraversion, conscientiousness; Ono et al., 2011). Although research has not investigated the path from intrinsic motivation (to help others) and social intelligence, literature supports a positive relationship between motivation to lead and social intelligence (Chan & Drasgrow, 2001).

Gatekeepers face the challenge of managing their own as well as others' emotions when confronting peers about suicidal thoughts and guiding those in crisis to seek help. Gatekeepers who demonstrate higher cognitive ability and who have more experience engaging with others socially (extraverts) may have more developed emotional intelligence and, thus, may be more likely to effectively help their peers. Similarly, conscientious gatekeepers may closely attend to emotions in others, consistent with instruction provided in gatekeeper training. Finally, gatekeepers who are motivated to help others may be more focused on others emotions in their social interactions with those in crisis. Therefore, heightened emotional intelligence, which may stem, in part, from strong cognitive ability, positive personality traits (i.e., extraversion, conscientiousness), and intrinsic motivation, may increase the likelihood of effective gatekeeping behavior (i.e., identification and referral of a suicidal peer for help in highly emotional situations, probability that the suicidal peer will act on the referral via subordinate performance). *Thus, I hypothesize that individuals with higher scores on cognitive ability (i.e., GPA and SAT scores), extraversion, conscientiousness, and intrinsic motivation, will demonstrate higher scores on measures of emotional intelligence, which, in turn, will lead to greater identification and referral of suicidal individuals (Hypothesis 5).*

Problem Solving Skills

Mumford et al. (2000) argue that to be most effective, "leaders must define significant problems, gather information, formulate ideas, and construct, prototype plans for solving the problem" (p. 157). Research confirms that strong problem solving skills

heighten leaders' ability to perform these tasks (i.e., to lead effectively; Zaccaro, Mumford, Connelly, Marks, & Gilbert, 2000). Furthermore, Connelly and colleagues' (2000) findings suggest that problems solving skills partially mediate the pathway from cognitive ability, positive personality traits, and motivation to leadership. Problem solving is also positively associated with cognitive ability (Borman et al., 1993; Connelly et al, 2000), positive personality traits (e.g., extraversion, conscientiousness; Chartrand, Rose, Elliott, Marmarosh & Caldwell, 1993; Elliott, Herrick, MacNair, Harkins, Elliott, & Shrout, 1992; Van Iddekinge et al., 2009; Zaccaro et al., 2000) and intrinsic motivation (e.g., MacKinnon, 1999; Song & Grabowski, 2006).

Gatekeepers use problem-solving skills throughout the process of managing a crisis situation. It is likely that gatekeepers with higher scores on cognitive ability and extraversion will have better developed skills to understand and manage the information they gather from peers in distress, and thus, make the most appropriate decisions. Also, those gatekeepers who are more conscientious and/or intrinsically motivated will be more likely to persist through complex problems toward a solution designed to help their peer through a crisis. *Therefore, I hypothesize that individuals with higher scores on cognitive ability, extraversion, emotional stability, conscientiousness, and intrinsic motivation, will demonstrate higher scores on measures of problem solving, which in turn, will lead to greater identification and referral of suicidal individuals (Hypothesis 6).*

Knowledge

Knowledge, which is illustrated through the recall and recognition of declarative facts and by the demonstration of procedural skills, is integral to successful leadership.

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Leadership literature has established knowledge as a significant predictor of leader

effectiveness (Zaccaro et al., 2000) and recognizes its role in the connection between

cognitive ability, personality, and motivation (Connelly et al., 2000; Zaccaro et al., 2004).

Cognitive ability and intrinsic motivation are widely accepted as predictors of knowledge

acquisition and sharing of knowledge with others (e.g., Lin, 2007; Rolfus & Ackerman,

1999). Knowledge emerges when individuals have the cognitive appraisal skills that

allow them to draw lessons and information from their experiences (e.g. Zaccaro et al.,

2004). It is also influenced by an individual's desire to gain knowledge and share it with

others for the pure enjoyment of obtaining knowledge and helping others (Lin, 2007).

Higher levels of conscientiousness have also demonstrated a consistent association with

knowledge acquisition because conscientious individuals study more to enhance their

knowledge (e.g., Furnham & Chamorro-Premuzic, 2006; Rolfus & Ackerman, 1996;

Martocchio, J.J., & Judge, T.A., 1997; Matzler, K., Renzl, B., Muller, J., Hertling, S., &

Mooradian, T.A, 2008). Interestingly, research suggests that extraversion demonstrates

either a negative (Rolfus & Ackerman, 1999) or non-existent relationship (Rolfus &

Ackerman, 1996) with knowledge acquisition and use in academic settings. Rolfus &

Ackerman (1999) hypothesize that introverts spend more time studying and extraverts

more time socializing making knowledge acquisition more natural for introverts.

However, it is important to take context into account when attempting to

determine the association between individual traits and leadership effectiveness (Zaccaro

& Klimoski, 2001). Gatekeepers, for example, are trained and then, operate in a social

context. Extraverted gatekeepers may ask more questions to acquire knowledge in group

trainings, and participate more actively in the role-plays. Consequently, they may gain equal if not superior knowledge to introverts in the context of gatekeeper training and thus serve as highly effective gatekeepers.

In summary, extraverted gatekeepers with greater cognitive abilities are likely to have superior knowledge acquisition skills. Similarly, gatekeepers who are more vigilant about and concerned with performing their job effectively (high scores on conscientiousness) and intrinsically motivated to participate in gatekeeper training (i.e., see value in helping others) will expend more effort in acquiring the knowledge they need to effectively perform their job. This behavior will, in turn, contribute to their ability to effectively and efficiently identify and refer suicidal peers. Accordingly, *I hypothesize that that individuals with higher scores on cognitive ability, extraversion, emotional stability, conscientiousness, and intrinsic motivation, will demonstrate higher scores on measures of knowledge which, in turn, will lead to greater identification and referral of suicidal individuals (Hypothesis 7).*

The Present Study

The purpose of the proposed study will be to examine whether constructs included in a slightly modified version of Zaccaro et al.'s (2004) *Model of Leader Attributes and Leader Performance* can be used to predict effective peer suicide gatekeeper behavior on a college campus. Specifically, I will examine whether greater cognitive ability, pro-social and positive personality traits, and/or intrinsic motivation (general and for participation in the "Mason Cares" suicide prevention gatekeeper training), is associated with higher knowledge acquisition as well as social appraisal and/or problem solving

skills, which in turn predicts retention of information imparted during gatekeeper training

and dissemination (i.e., identification and referral of suicidal students).

Study Hypotheses
Based on the review of the literature, the following hypotheses* are offered:

1. *Individuals who demonstrate higher cognitive ability will make more identifications and referrals of at risk individuals.*

2. *Individuals with higher scores on extraversion will demonstrate higher levels of identifications and referrals.*

3. *Individuals with higher scores on conscientiousness will demonstrate higher levels of identification and referrals.*

4. *Individuals with higher scores on intrinsic motivation to help others will demonstrate higher levels of identification and referrals.*

5. *Individuals with higher scores on cognitive ability (i.e., GPA and SAT scores), extraversion, conscientiousness, and intrinsic motivation to help others will demonstrate higher scores on measures of emotional intelligence, which, in turn, will lead to greater identification and referral of suicidal individuals.*

6. *Individuals with higher scores on cognitive ability, extraversion, conscientiousness, emotional intelligence and intrinsic motivation to help others will demonstrate higher scores on measures of problem solving, which in turn, will be associated with greater identification and referral of suicidal individuals.*

7.   *Individuals with higher scores on cognitive ability, extraversion, emotional stability, conscientiousness, and intrinsic motivation to help others will demonstrate higher scores on measures of knowledge which, in turn, will lead to greater identification and referral of suicidal individuals.*

All of the aforementioned hypotheses will control for potential covariates (socio-demographics, number of social interactions, psychiatric symptoms). Such theory driven research focused on the identification of college students who will make the most effective gatekeepers, may help to improve suicide prevention efforts by allowing for targeted training.

Method

Participants

Data will be drawn from 200 college students who participate in a 1- hour gatekeeper training at George Mason University. Inclusion criteria includes: 1) older than 18 years of age; 2) have not completed a gatekeeper training before; and 3) proficiency in English. Participants will be recruited from a diverse campus with a total of 21,990 undergraduate students. George Mason University is largely a commuter school with only 18% of students living on campus. I have already obtained support from the Director of CAPS (Dr. Barbara Meehan) and the Assistant Director of Wellness and Prevention in charge of Mason Cares (Leslie Geer) to conduct this study. The George Mason IRB has granted approval for the trainings to be implemented and all proposed data to be collected.

Procedure

 Counseling and Psychological Services (CAPS) has provided me with permission to use their materials and deliver their abbreviated (1-hour) Mason CARES training program as a part of this research study. Two hundred undergraduate students will be enrolled via SONA systems and recruitment from the University community. All participants will provide their consent and fill out a 1-hour online baseline assessment, remotely, in Qualtrics prior to attending an in-person 1-hour Mason Cares gatekeeper training on campus. The study Investigator (Bethany Rallis) and other doctoral students in the clinical psychology program will facilitate the gatekeeper trainings. After completing the training, participants will fill out a 15-minute post training knowledge assessment via paper and pencil at the training location. Students will receive 3 hours of credit or $12 in cash for completing baseline assessment, the training, and pre-post knowledge assessments. Students who sign up through SONA systems will receive research credit and students enrolling outside SONA systems will earn $12. During the initial baseline assessment, participants will be asked to provide their e-mail address and phone number. Following the baseline assessment, a research assistant will e-mail, call, or text message participants a range of dates for their 3-month follow-up assessment, as well as the type and amount of compensation provided after completion. When participants are due for their 3-month follow-up a reminder e-mail, phone call, or text message will be sent to them with instructions for filling out the assessment remotely, via Qualtrics, from their personal computers. The 3- month follow-up assessment will include the same knowledge assessment administered at baseline that assesses knowledge and skill retention as well as whether any peer mental health referrals were made (i.e.,

dissemination). The 3-month follow-up assessment will take approximately 1 hour and participants will receive $20 in cash upon completion. In order to receive their cash payment, participants will be given an on-campus location at which they may pick up the payment from a research assistant in person and sign a receipt.

With regard to demographics, George Mason University enrolls both in-state and out of state students from across the country and around the world. The school population is 49% White, 14% Asian, 10% Hispanic Latino, 9% Black/African American, 3.5% Bi-racial, 3% Native Hawaiian/Pacific Islander, and 1% Native American/Alaska Native).

Mason Cares Training. The 1-hour Mason Cares training will closely resemble the Question, Persuade, Respond (QPR) training out of the QPR Institute. The hour-long training will focus on training participants to: Recognize the signs of distress; Ask directly about suicidal thoughts; Follow the appropriate referral system within the University to facilitate the student receiving help

The didactic portion of the training will be approximately 45 minutes and will be followed by a 15-minute block during which participants pair off to practice communication and referral skills through role-play. Participants with base their role-play on a case example of a college student who demonstrates warning signs of suicide. In addition, participants will be provided with a manual that they can take with them that will equip them with additional information (i.e., college suicide statistics and facts, reasons why college students attempt suicide, myths and facts related to suicide). This manual will also include a conversation guide, referral contacts, and a referral guide that may be helpful to participants should they find themselves helping a distressed student.

Measures

    Demographics. Demographic information will be gathered using a form that asks for participant age, sex, race, ethnicity, sexual orientation, military status, academic year, major, and participation in organizations or groups at GMU.

    Psychiatric Symptoms. The Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983) is a 53-item self-report measure that assesses psychological functioning in adults. Participants rate the extent to which they have been bothered (0 ="not at all" to 4="extremely") in the past week by various symptoms. The BSI has nine subscales designed to assess individual symptom groups: somatization (SOM, e.g., "Faintness or dizziness"), obsessive-compulsive (OC, e.g., "Having to check and double-check what you do"), interpersonal sensitivity (IS, e.g., "Feeling inferior to others"), depression (DEP, e.g., "Feeling no interest in things"), anxiety (ANX, e.g., "Feeling tense or keyed up"), hostility (HOS, e.g., "Having urges to break or smash things"), phobic anxiety (PHB, e.g., "Feeling uneasy in crowds, such as shopping or at a movie"), paranoid ideation (PAR, e.g., "Others not giving you proper credit for your achievements"), and psychoticism (PSY, e.g., "The idea that something is wrong with your mind"). The BSI also includes a global severity index (GSI). The BSI has adequate reliability (α =.71-.85; r =.68-.91) and validity (Derogatis, 1993). The GSI index T-score will be examined in preliminary analyses.

    Cognitive Ability. Cognitive Ability will be assessed through participants' current self-report of their GPA and of their SAT scores.

    Personality Traits. Personality Traits will be assessed via The Big Five Inventory (John, Naumann, & Soto, 2008; John, Donahue, & Kentle, 1991), The Big Five Inventory

(BFI) (John et al., 1991) is a 44-item measure with five scales: Extraversion (8 items), Agreeableness (9 items), Conscientiousness (9 items), Neuroticism (8 items), and Openness (10 items). Participants will be instructed to read the phrase ''I am someone who. . .'' followed by the item statement (e.g., ''Can be moody''). Respondents will indicate to what degree they agree with each statement using a 5-point Likert scale ranging from 1 (Disagree Strongly) to 5 (Agree Strongly). The reliability and validity of the BFI has been established across age, gender, and culture (e.g., Soto & John, 2009; Worrell & Cross, 2004), and research supports a five-factor solution (e.g., Fossati, Borroni, Marchione, & Maffei, 2011). Coefficient alphas (e.g., $\alpha = .70$ to .80) and test–retest reliabilities (e.g., $r = .75$ -.90) across scale scores are satisfactory (e.g., Benet-Martínez & John, 1998; Worrell & Cross, 2004) in cross-cultural samples using multiple translations of the measure.

Motive/Need. Motive/Need will be assessed with the Work Preference Inventory (WPI; Amabile, Hill, Hennessey, & Tighe, 1994) and questions about the participants' reasons for signing up for the training. The WPI, a 30 item self-report measure, assesses individual differences in intrinsic and extrinsic motivation using a 4 point likert scale ranging from 1("never or almost never true for me) to 4 ("always or almost always true for me"). The WPI has demonstrated reliability and validity in college students and working adults samples (Amabile et al., 1994). Participants will also be asked to rank order, on a scale of 1 (most important) to 3 (least important) the reasons that they chose to participate in the gatekeeper training. Response options will include: course credit, payment, and desire to help others.

Emotional Intelligence. Emotional intelligence will be assessed using the Total Emotional Score of the Social Skills Inventory (SSI; Riggio, 1986). The 45-items in the Total Emotional score assess expressivity, sensitivity, and control in the emotional the realm and has been used as a self-report measure of emotional intelligence (See Murphy, 2002). The items include self-descriptive statements rated on likert scales ranging from "not at all true of me" to "very true of me". The Total Emotional Score consists of three subscales, including emotional expression (.81), emotional sensitivity (.90), and emotional control (.88), with adequate test-retest reliability for each subscale (Deniz, Hamarta, & Ramazan, 2005).

Problem Solving. Problem Solving will be assessed using the 25-item Social Problem Solving Inventory – Revised: Short Version (SPSI-R:S; D'Zurilla & Nezu, 1990; D'Zurilla, Nezu, & Maydeu-Olivares, 2007). This measure assesses strengths and weaknesses in problem solving abilities across five domains (positive and negative problem orientation; rational problem solving, impulsivity/carelessness style; avoidance style).

Knowledge Retention. Declarative and perceived knowledge will be assessed with questions based on material presented in the Mason Cares training program.

Dissemination and Referral. Dissemination will be assessed by asking participants the following questions: how many suicidal students have you identified in the last 3-months; how many suicidal students have you referred for concerns related to suicide; where did you refer each student; and to provide demographic information on individuals they referred.

Social Interaction. Number of social interactions will be assessed with the Social

Connections Index (Kaplan, Salonen, Cohen, Brand, Syme, & Pusk, 1988), a 5 item

measure designed to measure extent and frequency of social interaction (i.e., planned

visits with friends & relatives, meetings with clubs & societies, number of daily

interactions, & marital status). A sum score across all items is used to determine the total

score. Questions have response categories ranging from 1 to 6. Marital status, a

dichotomous variable, is weighted 1 (unmarried) or 4 (married) to equalize its

contribution to the total score. The SCI has demonstrated reliability and validity in a

sample of men and women from Finland (Kaplan et al., 1998).

Data Analyses

First, a series of bivariate correlations will be run to examine the individual

relationships among potential covariates (socio-demographics, number of social

interactions, psychiatric symptoms), cognitive abilities, personality traits, motives/values,

problem solving skills, social appraisal skills, and knowledge retention as well as

dissemination.

Next, a series of structural equation models will be conducted using AMOS (Analysis

of Moment Structures; Arbuckle, 1995) in order to test the measurement and theoretical

models (see Figure 1). Confirmatory Factor Analyses on manifest indicators of constructs and

multiple regression analyses on latent constructs will be conducted. AMOS provides

reliabilities and co-variances for the manifest indicators of latent constructs in the measurement

model. It also calculates an observed covariance matrix to solve for path coefficients and an

implied covariance matrix. The observed covariance matrix will be examined for problems due

to multi-collinearity or singularity. Finally, the fit of the data with the proposed theoretical model will be evaluated by examining the difference between the observed and implied covariance matrices using multiple fit indices. Model fit will be explored in all models using Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Chi-square values (Byrne, 2010) controlling for covariates. Throughout data analysis, full information maximum likelihood estimation with robust standard errors will be used; this approach uses all of the information of the observed data to create parameter estimates and standard errors, and is an attempt to address the missing data in the sample.

APPENDIX B

This decision tree comes from the Mason Cares 1-hour gatekeeper training and was presented to gatekeepers during trainings in this study.

WARNING SIGNS

First Tier

- Someone threatening to hurt or kill themselves.

- Someone looking for ways to kill themselves.

First Tier

- Someone talking or writing about death, dying, or suicide

ASK THE QUESTION:

Are you thinking about killing yourself?

YES

Second Tier

Presence of....
- Ideation
- Substance Use
- Purposelessness
- Anxiety
- Trapped
- Hopelessness
- Withdrawal
- Anger
- Recklessness
- Mood Change

NO

Be ready to ask the question again--if the person's mood continues to decline or you notice other warning signs.

Follow-up Questions:

-Do you have a plan for how to kill yourself?
-If yes, has a plan. Do you have access to the means to carry out the plan?
-Have you taken any actions to kill yourself already?

YES to any

NO to all

- Listen to person's story
  - **Use active listening skills**
  - **Listening, reflecting, connecting, and caring**
  - **Balance between** *paraphrasing* **(restating what person said: "You are saying…") and** *probing* **(question/seek information)**

-**Ask the person if they would be willing to meet with a counselor.**

If necessary …

Contact Counseling and Psychological Services (703-993-2380)

Contact Office of Student Support and Case Management (703-993-5376)

Contact your Resident Life Staff

Contact Campus Police (703-993-2810 or 911)

After crisis over …

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