

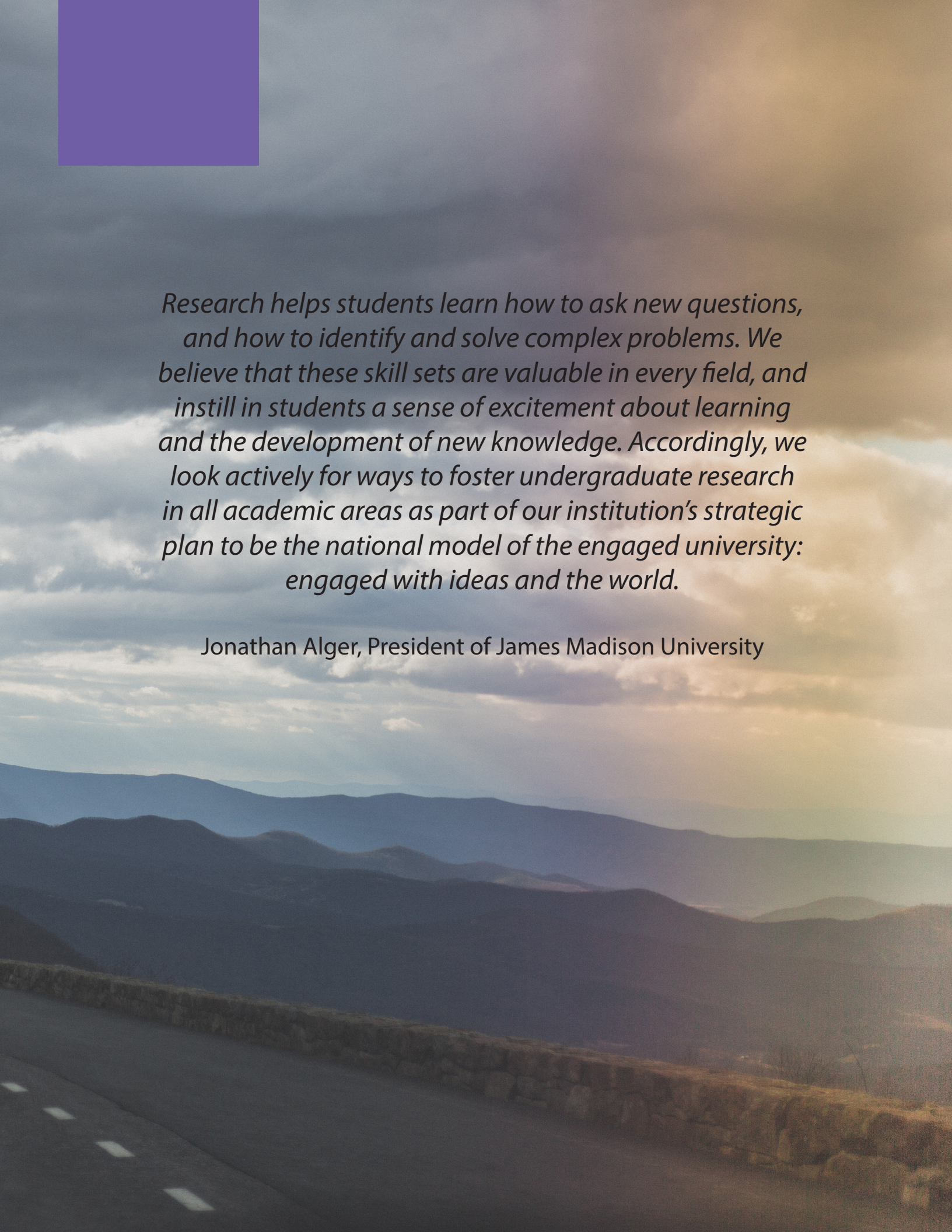
JAMES MADISON

Undergraduate Research Journal



J MUR J
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James Madison University

Volume Three 2015-2016



Research helps students learn how to ask new questions, and how to identify and solve complex problems. We believe that these skill sets are valuable in every field, and instill in students a sense of excitement about learning and the development of new knowledge. Accordingly, we look actively for ways to foster undergraduate research in all academic areas as part of our institution's strategic plan to be the national model of the engaged university: engaged with ideas and the world.

Jonathan Alger, President of James Madison University

James Madison Undergraduate Research Journal

Volume Three | 2015-2016

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Letter from the Editors

Dear Reader,

We are pleased to present Volume Three of the *James Madison Undergraduate Research Journal*.

The six texts here—from Biology, Communication, Education, Political Science, and Psychology—embody *JMURJ*'s commitment to promoting, publishing, and sharing the diverse research and scholarship that undergraduate students produce in disciplines across campus. They represent the tip of a big iceberg: students from all seven JMU undergraduate colleges in 24 different majors submitted their work to *JMURJ* over the past year. With nearly 20 submissions already slated for faculty review and more submissions coming in, the future is indeed bright.

Sharing all of this great work kept our Design and Outreach teams busy. We created a thick stack of print and online stories; designed slides, stickers, posters, and even coffee mugs; participated for the fourth year in a row in the Honors Symposium; and continued to publish on JMU's Scholarly Commons, where *JMURJ* articles have been downloaded more than 5,200 times in the past year. Along the way, we broadened our social media presence. Check out the new *JMURJ* Pinterest page (<https://www.pinterest.com/jmurjeditorial/>) and this volume's front cover, which features Cassey Jennings' winning entry in *JMURJ*'s first Facebook photo contest (we've included other deserving entries on page 59).

As always, we are indebted to the JMU faculty members, administrators, and administrative assistants who have offered their insight and support over the years. Almost 70 faculty members volunteered to review manuscripts for Volume Three alone, and the next page lists 52 first-time faculty reviewers from 21 different departments.

We sincerely hope that you enjoy the excellent research and scholarship created by JMU students.

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“That Sucks?”

An Evaluation of the Communication Competence and Enacted Social Support of Response Messages to Depression Disclosures in College-Aged Students

Daniel Vieth

Recent communication research on depression has focused on which response messages are most effective in providing emotional comfort to depressed individuals during depression dialogues. This study investigates the impact that a confidant’s initial response to a disclosure has on the disclosing individual, a key moment of dialogue for those with depression. It examines the relationship between the communication competence of responses to depression disclosures and how individuals rate those responses’ enacted social support, hypothesizing that the higher the communication competence of a confidant’s response (where competence reflects the effectiveness of interdependent communication), the more enacted social support the discloser will perceive (where enacted social support assesses how effectively a confidant’s response actually provides support).

College-aged participants from a large southern university completed Goldberg’s (1993) Depression Inventory Questionnaire before evaluating the enacted social support in depression disclosure responses of varying competence. Results suggest that the greater the competence of a response, the more enacted social support the individual making the disclosure will perceive. Results also suggest that the presence of depressive symptoms will slightly impact how an individual evaluates a response message’s level of enacted social support. College-aged adults exhibit a higher risk of depressive symptoms, making this group an important starting point for further research on depression dialogues.

Depression and depressive disorders are serious and all-too-common mental health concerns (Cassano & Fava, 2002). According to a 2008 survey conducted by the Centers for Disease Control and Prevention, approximately one in 20 Americans suffer from some form of depression. Depression continues to increase in individual, societal, and economic costs, with the World Health Organization predicting in its *World Health Report 2001: Mental Health: New Understanding, New Hope* that depression will become the second leading cause of disability-adjusted life years (DALYs)¹ lost due to mental illness by 2020 (World Health Organization, 2001).

Although depression affects people of all ages, it has been identified as a serious health concern for young, college-aged adults, as symptoms of depression for those impacted appear to peak during late adolescence (Aseltine, Gore, & Colten, 1994; Wright et al., 2013). Many factors that contribute to depression such as financial issues, feelings of loneliness, and substance abuse coincide with the typical college experience, making it especially important to understand competent communication dialogue for college-aged individuals with depression (Cassano & Fava, 2002; Wright et al., 2013). The prevalence of depression in young adults points to the importance of understanding which messages will be most beneficial to individuals during the key moment of dialogue, spoken or written, when an individual discloses his or her depressive symptoms (Wright et al., 2013).

Communication researchers have examined the ways in which different messages and message types impact a depression disclosure dialogue. For example, communication studies have focused on how the quality of a depression disclosure message impacts the quality of the response (Lienemann, Siegel, & Crano, 2012; Scott, Caughlin, Donovan-Kicken, & Mikucki-Enyart, 2013), the difference a message's medium makes (Whitehill, Brockman, & Moreno, 2012; Wright et al., 2013), and what impact gender has on message evaluation (Barton, Hirsch, & Lovejoy, 2012).

This study addresses the impact that a confidant's initial response to a disclosure will have on the disclosing individual. The confidant's response is a key moment of dialogue for those revealing their depression as it will impact the amount and quality of emotional comfort the discloser will perceive. By addressing the communication competence (the measure of how effectively response messages lead to feelings of increased support) and the

perception of enacted social support (the quality to which the discloser receives support from an individual's message) in written responses to depression disclosures for college-aged adults, this study contributes new insight on a population particularly susceptible to depression (Wright et al., 2013).

Using Goldberg's (1993) Depression Inventory Questionnaire, Scott et al.'s (2013) interpretation of O'Keefe's (1988) theory of message design logics, and Goldsmith, McDermott, and Alexander's (2000) Enacted Social Support Scale, this study sought to determine if there is a relationship between the communication competence of a confidant's response to depression disclosures and the discloser's perception of enacted social support in those messages. The results show that, in general, the more competent a response is to a depression disclosure, the more enacted social support is perceived and that a slight correlation between depressive symptoms and less perceived support exists.

Approximately one in 20 Americans suffer from some form of depression

Literature Review Depression and College-Aged Adults

While depression can manifest in multiple forms, some of the major negative consequences of depression include significant mental distress and psychosocial functional impairment (Cassano & Fava, 2002). A substantial number of people with clinically diagnosed depression first exhibit these symptoms during their adolescent years (Cassano & Fava, 2002). One major influence is the adjustment to college life, which can be a time of "considerable social stress and transition" (Aseltine et al., 1994, p. 252). Other notable factors that contribute to depression for young adults include financial issues, feelings of loneliness, interpersonal relationship skill deficits, differences in race, ethnicity, and sexual orientation, and overall increased levels of social, societal, and academic stress (Wright et al., 2013). The negative mental and psychosocial symptoms of depression are also often compounded for adolescents by increased alcohol, tobacco, or drug abuse, and increased levels of anxiety, resulting in comorbidity with other chronic mental health issues, immunodeficiency, and an increased risk of suicide (Cassano & Fava, 2002; Wright et al., 2013).

Though there are a number of different methods to help diagnose depression, one of the most popular is Goldberg's (1993) Depression Inventory Questionnaire, often informally known as Goldberg's Depression Scale (Aminpoor, Afshinfar, Mostafaei, & Ostovar, 2012). Goldberg's Depression Scale is an 18-question, Likert-type preliminary diagnostic test originally designed to help physicians better determine if patients have depressive

¹ DALY: A measure of the overall burden caused by disease represented by number of years lost due to ill-health.

symptoms before an official clinical diagnosis. Individuals can now complete the scale online to self-diagnose without or before seeing a physician (Aminpoor et al., 2012). The directions of the test ask participants to answer the questions in regard to how they have felt and behaved in the past seven days (Goldberg, 1993). Individual scores from the test are then used to place patients into one of six different categories of likelihood for depression, ranging from “depression unlikely” to “severe depression,” with the higher scores representing more severe symptoms (Goldberg, 1993). These measurement scales are useful for doctors to screen patients, and for individuals to check their own symptoms before visiting a physician (Aminpoor et al., 2012).

Depression and Message Interpretation

Research has indicated that people with varying levels of depression will respond differently to messages regarding depression or other medical issues compared to individuals who are asymptomatic (Bell et al., 2010). This could be due to the lower self-verification levels reported for individuals with depression because lower self-verification levels negatively impact how they interpret feedback (Wright et al., 2014). For example, individuals with low self-verification may discount or ignore positive feedback, or even seek negative feedback despite their need for positive support (Wright et al., 2014).

Because of this low self-verification, not all support will be beneficial to those with depression symptoms (Schwarzbach, Luppá, Forstmeier, Konig, & Reidel-Heller, 2013). While people with greater access to support are generally better able to cope with their emotional distresses and live happier and healthier lives, not all relationships are healthy, and not all relationships provide truly beneficial support (Bodie et al., 2012; Schwarzbach et al., 2013). Even close relational partners do not always provide the desired messages, and messages intended to be supportive may still have detrimental effects (Goldsmith et al., 2000).

The cognitive theory of depression and the help-negation effect are two theories which try to explain the negative bias of those with depression. The cognitive theory of depression states that due to a negative lens through which information is processed, people with depression who are exposed to messages about themselves are more likely to have a negative bias toward such messages, even if they are positive (Lienemann et al., 2012). Similarly, the help-negation effect is the phenomenon in which the more an individual becomes at risk (e.g. for suicide) the less likely he or she will seek help from a professional,

friend, or family source (Czyz, Horwitz, Eisenberg, Kramer, & King, 2013).

These findings demonstrate the importance of the message recipient’s perspective regarding what messages they consider more or less supportive (Goldsmith et al., 2000; Lemieux & Tighe, 2004). Recognizing the low self-verification of individuals who are depressed is also important for determining what messages are more competent. For example, confidants responding to depression disclosures should keep in mind that depressed individuals often respond more negatively to health-related messages, which affects how messages will or will not lend social support. Understanding the mindset of the discloser is an important factor in providing support as a confidant.

Depression Disclosures

Depression disclosure is the key moment where depression symptoms are revealed to a chosen confidant (Scott et al., 2013). Differences in how an individual discloses his or her depressive symptoms indicate how that individual rationalizes these symptoms (Harvey, 2012) and have been shown to influence the nature of the response (Scott et al., 2013). For example, the more overtly suicidal a disclosure is, the more likely a respondent will mention professional help, while the more general the disclosure is about depressive symptoms, the more likely the respondent will offer social- or problem-oriented assistance (Barton et al., 2012). These findings demonstrate the impact that differences in disclosure messages can have on the subsequent responses to disclosure.

Communication Competence of Responses to Depression Disclosures

Throughout the many different contexts in which depression disclosure conversations can occur, the style of response will regardless impact the relationship between the two or more individuals (Scott et al., 2013). Responses to a depression disclosure are an integral component in how effective the entire discourse will be for the discloser (Scott et al., 2013) because the confidant’s response is often influential for the discloser’s willingness to seek social support and professional help (Lienemann et al., 2013).

Spitzberg (1988) broadly defined communication competence as “the ability to interact well with others” (p. 68). Communication competence can be measured through differences in accuracy, clarity, comprehensibility, coherence, expertise, or appropriateness in one’s communication with others (Spitzberg, 1988). Scott et al.

Depressed individuals often respond more negatively to health-related messages

(2013) did a study on the communication competence of responses to depression disclosures and codified responses based on O'Keefe's (1988) theory of message design logics. This theory divides responses into three categories based on their purpose: expressive, conventional, and rhetorical (O'Keefe, 1998). The three message types were ranked from least to most competent (O'Keefe, 1988; Scott et al., 2013).

Expressive response messages, the least competent overall of the three categories, are emotional responses that have little to do with the context of the situation, such as "That's messed up, don't kill yourself man" (Scott et al., 2013, p. 147). In the context of depression disclosure responses, expressive responses often seem to discount the diagnosis or unintentionally put down the individual, such as "You're not really depressed; you're just a little down" (Scott et al., 2013, p. 147). Expressive responses often carry a negative connotation, intentionally or not, that can further stigmatize depression (Scott et al., 2013).

Conventional response messages are socially accepted messages that would be expected in the situation, such as "I'm sorry to hear that, I'm here to talk if you need it" (Scott et al., 2013, p. 147). These messages are appropriate within most social contexts, as they could be used by most individuals in the same basic dialogue; however, they do not take into account the specific relationship between the discloser and their confidant (Scott et al., 2013). Conventional messages are regarded as more competent than expressive responses, though they do not necessarily convey more sympathetic listening (Scott et al., 2013).

Lastly, rhetorical response messages, regarded at the most competent of the three categories, treat the discourse as a process of context-appropriate coordination that takes into consideration the relationship between the individuals to better convey support and understanding (Scott et al., 2013). In other words, the communicator goes beyond socially accepted responses to incorporate truly empathetic messages (Scott et al., 2013). This could include messages like "I know how you feel, I've been going through something similar, but we can help each other" (Scott et al., 2013, p. 148).

Though most individuals who offer responses to a depression disclosure may have good intentions, not all responses are equal. By examining a response message in terms of its communication competence, it is possible to categorize and assess its effectiveness in showing empathetic listening ability, verbal and nonverbal sensitivity, encoding and decoding skills, and management of interactions in a conversation (Wright et al., 2013).

Enacted Social Support

One of the principal goals of depression disclosure is to attain social support (Scott et al., 2013). In a broad sense, social support is a communication variable that refers to the availability of people on whom individuals can rely (Zhou, Zhu, Zhang, & Cai, 2013). During times of emotional distress, individuals seek social support from others, often in the form of comforting messages aimed at lessening this distress (Lemieux & Tighe, 2004). While many studies focus on the availability of social support, or the "quantity or quality of support to which people have access," other researchers have looked to measure the enactment of social support, or "the actual utilization of these support resources" (Tardy, 1985, p. 188). In other words, rather than assessing whether a person feels like support is available, enacted social support looks at "what individuals actually do when they provide support" and the quality to which support was actually received by the other individual (Barrera, 1986, p. 417).

While enacted social support may include tangible actions, like a hug or financial support, individuals can also provide enacted social support through communicated messages (Barrera, 1986). These messages, when treated as a behavior themselves, can be evaluated by researchers based on the degree to which the individual's message actually provides enacted social support (Goldsmith et al., 2000). For example, Goldsmith et al. (2000) sought to measure how people evaluated behaviors by developing a multidimensional scale to measure how individuals would rate the enacted social support of messages. Goldsmith et al. accomplished this by splitting enacted social support into three dimensions: helpfulness, supportiveness, and sensitivity. While the dimensions overlap slightly, their variations are distinct. For example, helpfulness relates to problem-solving applications of a message, supportiveness addresses relational assurance, and sensitivity touches on the emotional connection of a message (Goldsmith et al., 2000). Measuring enacted social support involves retrospective evaluations assessing the perception of received support in messages and judgments about the message outcome in terms of cognitive, affective, and behavioral effects (Barrera, 1986; Bodie, Burleson, & Jones, 2012). Separating enacted social support from other social support measures is also important in understanding the coping and adjustment processes individuals experience in times of distress (Barrera, 1986).

To summarize, an individual message's communication competence can be assessed by O'Keefe's (1988) theory of message design logics, which divides and ranks communication responses into three categories: expressive

"I know how you feel,
I've been going through
something similar, but
we can help each other."

(emotional decrees), conventional (socially appropriate), and rhetorical (highly-contextual). Scott et al. (2013) created a series of depression disclosure response examples that were split into O'Keefe's categories, and Goldsmith et al. (2000) created a multidimensional scale that allows participants to evaluate an individual's behavior (like communicated messages) in terms of its enacted social support.

Together, the literature surrounding depression-related messages (i.e., disclosures and responses) indicates the importance of a confidant's competent communication during depression dialogues. This study contributes new knowledge to understanding communication competence by asking whether greater communication competence in responses to depression disclosures will increase the enacted social support the original discloser perceives. While researchers have studied communication competence and enacted social support separately, this study uses the measurement tools described above to test if there is a relationship between the two within the context of depression disclosure dialogues.

Research Hypotheses

H1: If a response to a disclosure of depression has a higher communication competence, the recipient of the message will perceive a higher presence of enacted social support.

Null1: If a response to a disclosure of depression has a higher communication competence, the recipient of the message will perceive no difference in the presence of enacted social support.

H2: If a person is likely to have depressive symptoms, then he or she will have a correspondingly strong or faint perception of received enacted social support after depression diagnoses.

Null2: Even if a person has a greater likelihood of having depression symptoms, there will be no change in the enacted social support he or she perceives in responses to depression diagnoses.

Methodology

In order to test the relationship between the communication competence of different responses to depression disclosures and the message recipient's perception of enacted social support, the experiment was split into three parts. Part I had participants complete Goldberg's Depression Inventory Questionnaire (see Appendix A) to measure their likelihood of depression symptoms. Part II randomly assigned participants to read one of the nine fictitious responses to a depression disclosure adapted from Scott et al.'s (2013) research on the communication competence of online depression

disclosures (see Appendix B). Of these nine messages, three were expressive, three were conventional, and three were rhetorical. For statistical purposes, the scores for each type of message were grouped together into the category they represented. Part III asked participants to evaluate the message they read in Part II through Goldsmith et al.'s (2000) Enacted Social Support Scale (see Appendix C). This semantic differential scale measures a message's enacted social support in three dimensions: helpfulness, supportiveness, and sensitivity.

This experiment was designed to find a statistical difference between how participants rated the enacted social support of different depression disclosure responses and the messages' competence. In other words, the research tested against the first null hypothesis (no relationship between communication competence and enacted social support) in order to determine if a higher communication competence in the response to a depression disclosure would result in a higher level in perceived enacted social support from the point of view of the original discloser. Additionally, this experiment compared the scores from Goldberg's Depression Scale in Part I with the scores from Goldsmith et al.'s Enacted Social Support Scale in Part II to evaluate if there was a statistical correlation between the likelihood of depression and the amount of enacted social support perceived.

Procedures and Instrumentation

This survey was approved by the university's Institutional Review Board (IRB), an independent ethics committee that reviews and monitors all studies involving human subjects. In order to comply with IRB regulations, all subjects were required to read a consent form and accept its terms before participating.

The experiment took the form of a posttest-only design, which measures the dependent variable (i.e., the perception of enacted social support) after the manipulation of the independent variable (i.e., the communication competence of responses to depression disclosure). The test was administered in three parts through the research software Qualtrics. Part I measured the likelihood of depression symptoms for planned correlation studies; Part II manipulated the independent variable (communication competence of responses to depression disclosure), and Part III measured the dependent variable (enacted social support). Participants were randomly assigned to different groups, each receiving only one of nine fictitious messages.

Part I: Measuring the likelihood of depressive symptoms with Goldberg's Depression Scale. The first tool that the participants were asked to complete was Goldberg's Depression Scale (see Appendix A), the 18-question, Likert-type test (discussed above) that asks participants

to answer questions regarding how they have felt and behaved over the past seven days. Each question has six answers with an associated numerical values, ranging from “Not at All” (0) to “A Great Extent” (5). For this research, one was added to each value to prevent participants from registering a score of zero. Individual scores were then placed into different categories of likelihood for depression, with higher scores representing more severe symptoms.

The total score for each participant was studied on an interval level to add validity to the statistical tests, meaning higher scores were evaluated as a greater likelihood for depressive symptoms. These scores were later used to investigate the second hypothesis: whether the greater likelihood of depressive symptoms impacted an individual’s perception of enacted social support in response messages. After participants completed the tests and the data were collected, the Goldberg scale’s reliability was measured using Cronbach’s reliability test, which assesses whether results are consistent enough to be considered reliable by measuring each participant’s score deviation from the mean. Goldberg’s scale was rated by the test as highly reliable with an alpha score of 0.92, or 92% confidence in the scale’s reliability.

Part II: Manipulating the communication competence of responses to depression disclosures with O’Keefe’s three categories.

The communication competence of responses to depression disclosures was manipulated in the second part of this experiment. Participants were asked to imagine they had just disclosed a depression diagnosis to a good friend. For the experimental stimuli, participants were randomly assigned to read one of nine fictitious disclosure responses adapted from the messages developed by Scott et al. (2013) in their research on communication competence and disclosures of depression based on O’Keefe’s (1988) theory of message design logics (see Appendix B). The nine responses were divided among the three levels of communication competence in the theory of message design logics (expressive, conventional, and rhetorical) with three experimental responses in each category.

Part III: Measuring the enacted social support with Goldsmith et al.’s scale. The final step in the experimental process asked participants to evaluate the message they were randomly assigned in Part II utilizing Goldsmith et al.’s Enacted Social Support Scale (see Appendix C). This semantic differential scale utilizes 12 bipolar adjectives (e.g., “helpful” versus “harmful”) to measure the enacted social support perceived from the messages. Each participant was asked to evaluate the randomly assigned response in Part II by scoring it on a number scale for each of the 12 bipolar adjective pairs. The results of this measurement were

studied on an interval level, which means the statistical tests were based on the total scores from each participant. The scale was set up so lower scores represented higher levels of enacted social support; the positive adjective was on the right and the negative on the left. For the pairs that were opposite, the numbers were reversed after the test to keep the scale consistent.

After participants completed the tests and the data were collected, Goldsmith et al.’s scale’s reliability was measured using Cronbach’s reliability test, which rated Goldsmith et al.’s scale as highly reliable with an alpha score of 0.98, or 98% confidence in the scale’s reliability.

Results

This study measured the impact of the communication competence of a confidant’s response on the enacted social support perceived by the discloser of depression. Participants read a depression disclosure response from one of the three levels of communication competence (expressive, conventional, and rhetorical), and completed

Goldsmith et al.’s Enacted Social Support Scale to evaluate that message. The sample of 191 participants reported a total mean of 38.76 (with 12 representing the highest possible level of perceived enacted social support and 84 representing the lowest

possible level of perceived enacted social support) and a standard deviation of 20.40 on Goldsmith et al.’s Enacted Social Support Scale. The standard deviation represents dispersion, or average variation of points from the mean, in the data.

Within Goldsmith et al.’s scale, the 76 participants randomly assigned to read one of the three expressive messages reported a mean of 55.24 and a standard deviation of 16.39, meaning generally lower levels of perceived enacted social support and lower consistency of scores. The 56 participants randomly assigned to read one of the three conventional messages reported a mean of 31.11 and a standard deviation of 13.80, meaning generally higher levels of perceived enacted social support and less variation in scores. Lastly, the 59 participants randomly assigned to read one of the three rhetorical messages reported a mean of 24.8 and a standard deviation of 14.97, meaning higher levels of enacted social support and a slightly higher consistency of scores than those who read the expressive messages. While there were no thresholds set for good enacted social support or good consistency, these statistics show that as communication competence changed from expressive to conventional to rhetorical messages, individuals generally reported perceiving higher levels of enacted social support respectively.

Participants were asked to imagine they had just disclosed a depression diagnosis

The first research hypothesis—if a response to a disclosure of depression has a higher communication competence, the recipient of the message will perceive a higher presence of enacted social support—was examined with a one-way analysis of variance (ANOVA) test.¹ Participants in this test were grouped by whether they read an expressive, conventional, or rhetorical message. The three communication competence groups of the nine depression disclosure response messages were the independent variable and the participant scores on Goldsmith et al.'s Enacted Social Support Scale were the dependent variable. A statistically significant difference was noted, with the *p*-value (the probability of obtaining the results by chance) falling below the threshold of 1%: $F(191) = 76.33, p < .001$.

In a follow-up to this hypothesis, a Tukey honest significant difference (HSD) test was conducted post-hoc to measure whether there was any significant difference between the mean perceived enacted social support scores of the three communication competence categories. A Tukey HSD test is performed after an initial ANOVA test to compare the possible pairs of means in two scales. In this statistical test, the mean perceived enacted social support scores from each of the three communication competence categories were compared to each other to determine whether the different levels of communication competence impacted the level of perceived enacted social support.

The Tukey HSD post-hoc indicated that there was a statistically significant difference between the enacted social support of expressive messages and conventional messages ($p < .001$, or less than .01% of the difference occurring by chance). There was also a statistically significant difference between the enacted social support of expressive and rhetorical messages ($p < .001$). However, the Tukey HSD post-hoc test did not find a statistical significant difference between the enacted social support of conventional and rhetorical messages ($p > .05$, or a greater than 5% chance that the results could have happened by chance).

The second research hypothesis suggested that there would be a relationship between the likelihood of depressive symptoms, measured by Goldberg's scale, and how individuals evaluated the enacted social support of depression disclosure responses. As stated above, the mean and standard deviation of Goldsmith et al.'s scale were 55.24 and 16.39 respectively; the mean and standard deviation of the Goldberg scale were 33.2 (between a score of 18 and 108) and 12.99 respectively.

¹ An ANOVA test is used to analyze the differences between group means, or in other words, to measure the variance of scores reported between different groups of participants.

To perform this analysis, a Pearson product-moment correlation was conducted.² Likelihood of depressive symptoms was found to have a negative relationship with perception of enacted social support in the messages, $r(191) = -0.14, p < .05$, which is considered a slight relationship. These statistical relationships suggest that individuals with a higher likelihood of depressive symptoms will on average perceive slightly lower levels of enacted social support in responses to depression disclosures.

Discussion

Communication Competence and Enacted Social Support

The findings of this study expanded upon the message categories of Scott et al.'s (2013) research on communication competence and O'Keefe's (1988) theory of message design logics by asking participants to measure each category's enacted social support through Goldsmith et al.'s scale. The study sought to discover if the type of message impacted how individuals perceived the quality of a response in depression disclosure communication. More specifically, the first research hypothesis asked whether a higher level of communication competence in a response to a disclosure of depression would result in a higher level of perceived enacted social support.

The results from the ANOVA test detailed above found a statistically significant difference in the mean enacted social support scales of the three different levels of communication competence, meaning the probability of the differences found between the means of the competence groups occurring by chance were less than 1%. Because a statistically significant difference was noted, the first null hypothesis was rejected. While the results do not prove there is a relationship, they do suggest that higher levels of communication competence in responses to depression disclosures will result in higher levels of perceived enacted social support. In other words, these findings show that message types with varying levels of communication competence do impact the perception of enacted social support in depression disclosure responses. The experimental design also allowed for high reliability with its measurement, both through the large number of participants ($N = 191$) and the random assignment of disclosure responses in the experimental procedures.

More specifically, the average scores for each message type point to rhetorical messages expressing the highest levels of enacted social support, followed by conventional messages and then expressive messages. Through the Tukey HSD post-hoc test, a statistically significant difference was found between the group mean scores for

² A Pearson P-product moment correlation is a statistical test that measures the relationship correlation, or dependence, between two variables. This level of correlation is presented as a number (*r*) between -1 (highly negatively correlated), and 1 (highly positively correlated).

enacted social support of expressive messages (emotional decrees that have little to do with context) and both enacted social support of conventional messages (expected responses of support in most contexts) and rhetorical messages (highly context-based responses). While the rhetorical messages did have a higher level of enacted social support than conventional messages, there was not a significant statistical difference between the two. These findings point to how important it is that confidants' messages relate to the context of the disclosure, in order to provide support to disclosers and help them move forward with recovery.

Likelihood of Depression Symptoms and Perception of Enacted Social Support

After comparing the results from Goldberg's scale and the individual ratings of enacted social support in the assigned responses, a negative correlation was found, meaning that individuals who had a higher likelihood of having depression symptoms typically rated depression disclosure responses as having slightly less enacted social support. Accordingly the second null hypothesis was rejected. While a statistically significant correlation was found between the two variables—communication competence message types and enacted social support scores—the correlation was only slight. The trend that these findings describe appears to relate to the cognitive theory of depression and the help-negation effect (the idea that depressed individuals have a lower self-verification and thus process information through a negative bias) (Czyz et al., 2013; Lienemann et al., 2012). Because of the negative bias, individuals with depression will find less support in any type of message response (Czyz et al., 2013; Lienemann et al., 2012). The relationship found in this study, however, does not hold much practical application because the correlation was only slight and the relationship should be explored in additional research.

Implications

While depression and depressive disorders continue to be prevalent in our society (Cassano & Fava, 2002), the study of this serious mental health concern will be important for communication researchers. Research on effective depression dialogues is especially important for better understanding college-aged adults, a population that has been shown to be particularly at risk for suffering from the symptoms of depression (Cassano & Fava, 2002; Wright et al., 2013).

The specific factor of depression communication that this research focused on concerns the communication competence of responses to a depression disclosure and how that impacts a depressed individual's perception

of enacted social support. In other words, when an individual discloses his or her depression to a confidant, does the competence of the confidant's response impact the level of enacted social support the discloser perceives? While similar research within the literature of depression disclosure communication has focused on other important factors related to the messages between disclosers and their chosen confidants, this research contributes to the field by focusing specifically on the perception of enacted social support of the response to a disclosure rather than solely on the disclosure itself. These findings play a significant role in understanding another vital part of the depression disclosure interaction: the response from a confidant.

The results from the statistical analysis support the first hypothesis that higher levels of communication competence in depression disclosure response messages lead to the discloser perceiving more enacted social support from the confidant. These findings support the need for confidants to understand the impact their messages have in helping or hindering the healing process for individuals experiencing depression (Cassano & Fava, 2002; Lienemann et al, 2012; Scott et al., 2013). More people need to understand the importance and impact of their messages when communicating with those with depression in order to begin the process of addressing this growing concern.

Limitations

Several possible limitations in the study could help explain why there was not a statistically significant difference between the enacted social support scores for conventional and rhetorical messages and why there was only a slight correlation between enacted social support and likelihood of depressive symptoms.

The first limitation lies in the research procedures, where participants were asked to simply imagine they had disclosed a diagnosis of depression to a confidant regardless of whether or not they had depressive symptoms. They were then asked to read one of nine response messages adapted from Scott et al.'s (2013) research without any context for where the individual might be talking or how close the confidant might be to the individual. This resulted from the quantitative nature of Likert-type tools, which cannot capture the contextual dialogue that is of particular concern for rhetorical responses. Without context, conventional and rhetorical messages become similar, possibly explaining why their Goldsmith scores were so close.

The second limitation came from the setup of the experiment in Qualtrics and the decision to not make any questions mandatory. While participants were allowed to

People need to understand the importance and impact of their messages

skip questions they were not comfortable answering, the study had to account for 39 blank or almost blank responses, which was a larger number of blanks than estimated. A number of blank surveys were expected due to the nature of the participant system, which did not require students to participate in studies they did not necessarily want to be a part of.

The last limitation was the interval level measurement of depressive symptoms. While the Goldberg scale does have established categories ranking likelihood of having depression, these categories could not be used in ANOVA tests, which require a single number representing each category instead of the range of values implied by a category. Goldberg's scale also does not allow for a clinical diagnosis of depression; it merely indicates a likelihood of depression. Without using a determined threshold for depressive symptoms, it is difficult to say if a clinical diagnosis of depression definitely impacts one's perception of enacted social support; rather, the results indicate that the more likely a person has depression, the less he or she will evaluate a disclosure response as having enacted social support

Directions for Further Research

This research is a starting point for further research on communication competence and depression disclosures. While this study asked participants to simply read a message and evaluate it using Goldsmith et al.'s Enacted Social Support Scale, further research could ask participants to simulate the context of the conversation for more qualitative results. By adding self-report measurement scales, interviews, or focus groups, researchers could better understand why participants evaluated messages the way they did.

Additionally, the subcategories of enacted social support could also be evaluated further in regard to the different communication competence message types. For example, participants' enacted social support scores could be split into how each one perceived the message's problem-solving utility, relational awareness, and emotional support. Each message type could be further examined for why it was or was not effective in comforting an individual disclosing depression, leading to a better understanding of exactly what aspects of a message are the most important in helping individuals feel more supported.

Further research could also expand upon the second hypothesis by looking at the relationship between the likelihood of depressive symptoms and an individual's perception of social support in comforting messages. In other words, while this study focused primarily on the

communication competence of a response in impacting the perception of enacted social support, further research could better test how the likelihood of depressive symptoms impacts the perceived level of enacted social support. Other demographics of the young adult participants could also be explored to determine whether variables make any impact on an individual's perception of enacted social support in messages or likelihood of depressive symptoms.

Overall, the study of depression and communication competence is important in understanding what messages are regarded as more effective in helping those individuals afflicted with depression. Understanding competent communication is especially important for college-aged adults, a population that has been shown to be particularly vulnerable to depressive symptoms, and an age where depressive symptoms often first manifest. For those individuals on either side of a depression disclosure dialogue, recognizing the importance of that communication exchange is paramount. This study points to the need for responses to a depression disclosure to be competent, taking into account the context of the situation and relationship between the two individuals. The evidence shows that greater communication competence will lead to higher levels of perceived enacted social support, an important step in the process of recovery for those with depression to feel a greater sense of social and emotional comfort.

Greater communication competence will lead to higher levels of perceived enacted social support

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Appendices

Appendix A: The Goldberg Depression Scale Inventory Questionnaire (Goldberg, 1993)

Please answer each question considering how you have felt over the past seven days.

If you are answering “A lot” or “A Great Extent” to many of these proposed questions, please do not hesitate to contact JMU’s Varner House and the Counseling & Student Development Center (CSDC).¹ There they provide free counseling in a safe and confidential environment for anyone who needs help. Phone number to call: (540)-568-655

Question	Not at all	Only Slightly	Partly	Quite a lot	A lot	A Great Extent
1. I do everything slowly						
2. My future seems hopeless						
3. I find it hard to concentrate when I read						
4. All joy and pleasure seem to have disappeared from my life						
5. I find it hard to make decisions						
6. I have lost interest in things that used to mean a lot to me						
7. I feel sad, depressed, and unhappy						
8. I feel restless and cannot relax						
9. I feel tired						
10. I find it hard to do even trivial things						
11. I feel guilty and deserve to be punished						
12. I feel like a failure						
13. I feel empty – more dead than alive						
14. My sleep is disturbed: too little or too much						
15. I wonder HOW I could commit suicide						
16. I feel confined and imprisoned						
17. I feel down even when something good happens to me						
18. I have lost or gained weight without being on a diet						

¹ Since this study was completed the CSDC has been moved to the Student Success Center. The phone number for CSDC is the same: 540-568-6552.

Participants were randomly assigned one of the following nine depression disclosure responses. Three represent each competence category: expressive, conventional, or rhetorical messages.

Imagine that you just told one of your good friends that you have been diagnosed with depression for the first time. Now imagine that your friend reacts in the way described below.

1. Expressive Messages:

- a. "Really? What made you think you have it in the first place?"
- b. "Dude, you don't have depression, you're just a little down."
- c. "Is it something really serious that you have to get medication for, or can you just do something in your everyday life to help you overcome it?"

2. Conventional Messages:

- a. "I'm so sorry to hear that, is there anything I can do to help? I want you to know that I am always here for you."
- b. "Do you want to talk about it? If you don't, I just want to let you know that you are my best friend and I wouldn't want anything bad to happen to you."
- c. "I'm so sorry, and I'm here for you. How do you feel about this?"

3. Rhetorical Messages:

- a. "I just want to you know that you are my best friend in the world and that I am here for you through this. Even on your worst days you should come to me and I will be there for you. We will get through this, don't even think of it as something you are going through alone. I know it is hardest for you because you have to live through it every day, but it is still something that I will go through with you like it is my own issue."
- b. "Oh my gosh, I'm sorry to hear that! I am here for you every step of the way. It is not your fault that you are suffering from this. There are a lot of people who get this, so don't feel like you are the only one. It was strong of you to go to the doctor and get help. I know this may not be easy, but I promise you that I will be here for anything that you need."
- c. "How are you feeling now? I'm really glad you decided to tell me this. I just want you to know that no matter what happens, I'll always be by your side. This won't change our relationship and you can always come to me. Is there anything I can do for you right now?"

* Indicates a reverse order question

Please evaluate the message you just read by identifying where it would be placed between each of these twelve bipolar pairs of adjectives.

	1	2	3	4	5	6	7	
Helpful								Harmful
*Useless								Useful
*Ignorant								Knowledgeable
*Selfish								Generous

	1	2	3	4	5	6	7	
Supportive								Unsupportive
*Upsetting								Reassuring
Comforting								Distressing
Encouraging								Discouraging

	1	2	3	4	5	6	7	
Sensitive								Insensitive
*Heartless								Compassionate
Considerate								Inconsiderate
*Misunderstanding								Understanding

The Effect of Sleep Deprivation on Cadet Performance and Behavior: A Proposal to Reform the ROTC Program at James Madison University



Josh Wells

This paper addresses the problem of sleep deprivation among cadets in the Army ROTC program at James Madison University. Drawing on existing research and Army doctrine, the author examines the necessity of sleep for decision making, the biological consequences of sleep deprivation, and the effects of sleep deprivation on emotional intelligence. The paper also questions large, early-morning Physical Training (PT) sessions and their effectiveness in developing group cohesion. After comparing the research to the practices of the ROTC program, the author proposes a new training method for ROTC cadets to address the problems of sleep deprivation and large group PT.

Imagine the following situation: you have class at 8 a.m. every Monday, Wednesday, and Friday. The classroom is a ten-minute walk from the parking lot, and with traffic it takes ten minutes to get to the parking lot from your home. Parking usually goes fast, so if you want a spot, you have to leave at least ten minutes earlier to beat the other commuters, meaning you need to be out the door no later than 7:30 a.m. You get to class feeling sleepy and exhausted, hating the fact that you have to get up around 7 a.m. to arrive on time. Yet, unknown to you, the ROTC cadet sitting next to you has already been awake for three or more hours and still has a full day to go through, just like you.

A cadet in the ROTC program at James Madison University (JMU) has the same obligations, duties, and responsibilities as a member of the armed forces, though he or she is still considered a “student first.” One of the many responsibilities of an ROTC cadet is maintaining a certain level of physical fitness by conducting physical training (PT) every Monday, Wednesday, and Friday; cadets who are in the junior class, or those who need additional help with their fitness, attend PT on Tuesday as well. Because most PT sessions are held at 5:50 a.m., Army ROTC cadets are prime candidates for experiencing sleep deprivation (given their obligations as cadets and students). However, rising this early in the morning helps address three goals of the ROTC program: it instills the discipline required of officers, avoids scheduling conflicts that prevent attendance, and helps develop group cohesion and pride, or *esprit de corps*. Unfortunately, these goals come at a cost: a lower total amount of sleep for the cadets per night.

The purpose of this paper is to address the issue of sleep deprivation within the ROTC program and explain the physical, psychological, and social consequences that result from it. The paper will also examine the potential benefits of lowering the PT group size from the size of the battalion (approximately 149 cadets) to four cadets per group. Finally, a study of experimental design will be proposed as a starting point for reforming the ROTC PT program at JMU.

Literature Review

Psychology of Group Fitness

Research has shown that group-based exercise programs are superior to individual exercise programs in regards to adherence and compliance to the program (Burke et al., 2010). However, in order for group-based exercise programs to be beneficial, members need to experience social contact and support (Burke, Carron, & Shapcott, 2008, p. 115). When a cadet at JMU shows up to PT at 5:50 a.m., he or she is one of 149. Susan Wheelan’s (2009)

study on work group size and group development shows how large groups are most likely less effective compared to smaller ones, noting that intimacy and cohesion, member satisfaction, participation, and expressed disagreement are negatively affected by increased group size. One possible way for members to experience a stronger sense of *esprit de corps* is to participate in the Integrated Model of Group Development, which is based on small group sizes of three to six members (Wheelan, 2009, p. 259). Though Wheelan’s study focuses on work groups, this model could be applicable to other types of groups, such as ROTC.

The Integrated Model of Group Development identifies four stages of group development: “Stage 1: dependency and inclusion; Stage 2: counterdependency and fight; Stage 3: trust and structure; and Stage 4: work” (Wheelan, 2009, p. 252). The first stage is characterized by a dependence on an established leader and members seeking inclusion, the second by conflict with emerging group norms and expectations, the third by mature negotiations of roles, organization, and procedures as well as positive work relations, and the fourth stage by intense productivity and effectiveness (Wheelan, 2009, p. 250). Groups cannot move on to higher stages until they successfully master the previous stage; it is also possible for groups to regress to previous stages (Wheelan, 2009, p. 250). Groups that operate at the third or fourth stage are far more productive, and groups of three to six cadets have a significantly higher chance of reaching these stages (Wheelan, 2009, p. 250 & 255). Following this logic, PT sessions with 149 people could be less effective compared to smaller PT groups. Conducting PT at a different time and in smaller groups could allow the cadets to function better as a group, which in turn could allow them to develop a stronger sense of *esprit de corps*.

Biological Impact of Sleep Deprivation

All contracted ROTC cadets will one day become officers in the Army. They will be responsible for the total well-being (physical, emotional, spiritual, etc.) of the approximately 40 people under their command. These cadets need to understand that, as future officers, their future soldiers’ physical well-being, as well as their own, is easily jeopardized by insufficient sleep. Without the proper amount of sleep, individuals can experience health problems such as allostatic overload.

Allostatic overload occurs when an imbalance is present in the body, disrupting allostasis. According to McEwen (2006), allostasis is the “active process that the body uses to establish and maintain equilibrium (homeostasis),” wherein two separate mediators act in a way to cancel out the opposing mediator (p. 20). Too much of one mediator

When a cadet at JMU
shows up to PT at
5:50 a.m., he or she
is one of 149

(allostatic overload) has harmful consequences. The physical results of allostatic overload related to sleep deprivation include increased blood pressure, decreased parasympathetic tone (hindering the ability to calm down when the heart rate is significantly increased), increased cortisol levels (a hormone created in response to stress and an excess of which can lead to Cushing's Syndrome), and increased appetite (which has a correlation to obesity and increased body mass) (McEwen, 2006, p. 21).

These symptoms do not account for the neural reconstruction that occurs in various brain locations (McEwen, 2006). For example, the "nucleus accumbens, an area in the brain involved with the anticipation of reward, becomes selectively more active under the conditions of SD during high risk-high payoff choices" (Hamidovic & de Wit, 2009, p. 263). Not only does sleep deprivation affect the brain physiologically, but it also accounts for negative psychological effects, including the inability to self-regulate, control emotions, and think critically. Implementing a new training model with workouts scheduled at a later time would give ROTC cadets the opportunity to get more sleep, thus avoiding the negative consequences of sleep deprivation.

Sleep deprivation and impulse control.

Self-regulation is the process by which we exert control over our "cognitions, affect, and behaviour in order to align with a desired standard" (Barber & Munz, 2011, p. 315). The capacity for self-regulation can be increased through routine exercises of self-control. Self-control is "the process by which urges, desires, emotions, or behaviors that are in conflict with long-term goals are overridden or inhibited" (Muraven, Collins, & Nienhaus, 2002, p. 113). It differs from self-regulation because self-control is expressed externally through one's actions while self-regulation is an internal process. Self-control is exhibited by saying no within a given situation while self-regulation is maintaining one's thoughts to keep from being tempted or being put into that situation.

The ability to self-regulate is a finite resource that is "depleted by activities that involve resisting temptations/impulses, persistence, or logical reasoning" (Barber & Munz, 2011, p. 315). Like self-regulation, self-control is also a finite resource that is depleted after each use, meaning that an individual's ability to use self-control will suffer after continual suppressions of urges, emotions, thoughts, and/or behaviors (Muraven et al., 2002, p. 114). In order to maintain healthy levels of self-regulation ability, sufficient sleep is needed to replenish the original self-regulatory energy, and consistent sleep helps to enhance self-regulatory capacity (Barber &

Munz, 2011, p. 315). The exact opposite of that statement also holds true: insufficient sleep leaves us with less self-regulatory energy to deal with stressors, and inconsistent sleep affects our behavior through "increased risk taking," "poorer decision making," and "deficiencies in reasoning and attention" (Barber & Munz, 2011, p. 315). Because sleep deprivation negatively influences self-control, cadets are left with a lower self-control baseline, which leads to increased risk behavior.

Sleep deprivation and risk assessment. Risk behavior is a multi-faceted concept that is directly observable, and "the amount of risk perceived will vary depending on the context and the situation" (McKenna, Dickinson, Orff, & Drummond, 2007, p. 246). Basic risk analysis involves considering one's actions based on the immediate understanding of what could be lost and what could be gained. McKenna et al. (2007) found that people who suffer from sleep deprivation "were willing to take more risk when they were considering a gain" (p. 250). It was also found that sleep-deprived individuals are "less concerned with negative consequences when faced with a potentially high reward" (Harrison & Horne, 2000, p. 239). Rewards don't need to be tangible; one can be rewarded with praise and social acceptance or with a desired physiological response.

Sleep deprivation also negatively affects our emotional intelligence and character

Sleep deprivation and emotional impact. Unfortunately, the consequences of sleep deprivation are not limited to our physiology, levels of self-control, and the amount of risk we are willing to pursue; sleep deprivation also negatively affects our emotional intelligence and character. The Army Doctrine and Training Publication (ADRP) 6-22, "Army Leadership" (2012) identifies empathy as one of the four main elements of a leader's character. Empathy is a character trait that is based on emotional intelligence; it is defined as "the ability to understand the emotions of others by vicariously sharing them" (Guadagni, Burles, Ferrara, & Iaria, 2014, p. 658). Guadagni et al. (2014) note that "sleep deprivation reduces the specific ability to share emotions experienced by others" (p. 661). In addition to not understanding others on an emotional level, we are also more susceptible to reacting impulsively to negative emotions such as loss or shame. "Sleep deprivation has previously been shown to disproportionately intensify neural and autonomic reactivity to negative emotional stimuli," substantially contributing to the increase in suicidal ideation and the impulse to act on it (Anderson & Platten, 2011, p. 465).

In times when we are more susceptible to negative emotions, we need to lean on our loved ones. General Odierno, the 38th Chief of Staff of the Army, wrote in

2012 that “The strength of our nation is our Army; the strength of our Army is our Soldiers; the strength of our Soldiers is their families.” ADRP 7-0, “Training Units and Developing Leaders” (2012) states that “Family well-being is essential to unit and individual readiness” (p. 2-5). When sleep deprivation strains personal emotional intelligence, it puts additional tension on interpersonal relations, including relations with family members, the very people needed to provide support. Vila and Samuels (2010) noted that “Fatigue also corrodes the quality of family and social interactions that help ground soldiers and buffer the impact of repeated exposure to a toxic work environment over the course of a decades-long career” (p. 799). When cadets or soldiers do not get enough sleep, there is a strong likelihood of entering a vicious cycle: a lack of sleep strains familial relationships, causing stress, which in turn makes it more difficult to sleep. The cycle’s self-perpetuating nature once again shows the importance of addressing the root of the problem and not just the symptoms: if cadets are struggling with relational issues due to sleep deprivation, their ability to think critically and solve problems may also suffer greatly.

The ROTC program is currently undergoing a nationwide curriculum shift where there is more of a focus on developing well-rounded, well-educated officers. The curriculum is less focused on being tactics based as there is a stronger need for officers who can utilize critical thinking skills and constructive thinking, a concept where individuals use a combination of adaptive problem-solving and emotional and behavioral coping skills when faced with highly stressful situations (Killgore et al., 2008, p. 518). Constructive thinking requires high levels of emotional intelligence because the same area of the brain, the prefrontal cortex, regulates both kinds of skills, and constructive thinking is a more accurate predictor for successful living than an intellectual test (Killgore et al., 2008, p. 518). Under conditions of sleep deprivation, even accumulated partial sleep deprivation, the use of constructive thinking is highly reduced. Sleep is vital to our critical thinking ability, which correlates to the successful completion of any training.

Current Actions Being Taken by the Army

Since effective training and development are crucial to the success of the Army, the Army created the Training and Doctrine Command (TRADOC). It is TRADOC’s responsibility to create the regulations, standards and requirements for all training, including the well-known Basic Combat Training (BCT). Soldiers entering BCT encounter a physically and mentally stressful environment that is unlike any that most people ever face (Crowley et al., 2012, p. 25). Even though the Army has created such a stressful environment, TRADOC has ensured that the

enlisted soldiers are able to get enough sleep; in TRADOC Regulation 350-6 (2015), it explicitly states that all soldiers in BCT must have the opportunity for at least seven hours of sleep per night (p. 76). Based on informal polls and personal observation, most ROTC cadets average about five hours a night, which means that they are sleeping about 10 hours per week less than soldiers at BCT.

Proposed Solution

As shown, ROTC cadets are at a heightened risk for sleep deprivation due to early training times, negatively affecting their health and the function of the organization. Additionally, large group PT has been proposed as less effective for achieving esprit de corps. To address these problems, I propose conducting PT in smaller groups at a time other than 5:50 a.m. This alternate start time allows for an optimal group size for group cohesion and a more intensive and effective workout can be conducted (with more options and resources to be used such as the UREC pool) because it is easier for a smaller group to meet during the day. Lower leadership within the battalion would have more opportunities to practice responsibility, and more importantly, the cadets would be given more sleep.

Below is my proposal designed for a small number of cadets to establish whether or not the cadets participating experience an increase of morale, fitness, and health as well as a decrease in risk behavior due to an increased amount of sleep. The experimental program would manipulate the cadets’ sleep and workout regimen and measure their motivation, risk behavior, and fitness. Testing a new ROTC training program design could lead to beneficial results and also exemplifies one of the Army’s traits of effective leadership. ADRP 6-22 (2012) states that “Strategic leaders are proactive towards change” (p. 11-4). In other words, just because it has always been done a certain way does not mean there is not a better way out there. This new design has the potential to be a more effective and efficient way to conduct PT, and if implemented, could promote noticeable differences in the cadets’ behavior and performances.

Method

Participants

Prior to any action being taken with participants, this study would need approval from the JMU Institutional Review Board (IRB) to ensure all ethical guidelines were followed. The participants would include 40 randomly selected Army ROTC cadets from JMU, and ideally this group would include ten cadets from each academic year, ranging from 17 to 22 years of age. The remaining members of the JMU Duke Battalion would be included in the study for comparison purposes. The cadets’ academic majors

The experimental program would manipulate the cadets’ sleep and workout regimen

would not be a factor in selection. Their incentives to participate include the immediate possibility of getting more sleep and the long-term benefit of knowing they could potentially adjust the program for future cadets.

Materials

The study would use two surveys, a physical fitness test, a sleep journal, and a sleep monitoring device called an actigraph. The first survey, created specifically for this study, would measure the cadets' level of motivation and group cohesion/pride at the beginning of the study using a Likert scale. The cadets would then be tested using the Youth Risk Behavior Surveillance System (YRBSS), which measures the frequency of risk behavior. The YRBSS examines six categories of risk behavior: "behaviors that contribute to unintentional injury and violence, sexual behavior that contributes to unintended pregnancy and [STIs], alcohol and other drug use, tobacco use, unhealthy dietary behaviors, and inadequate physical activity" (U.S. Department of Health and Human Services, 2015, par. 1). The Army Physical Fitness Test (APFT) would be used to evaluate the cadets' fitness prior to and post intervention. The APFT is composed of two minutes each of push-ups and sit-ups, followed by a two-mile run. The APFT would be conducted by graders who have been trained on proper forms and standards and would use stopwatches and a quarter-mile running track for the two-mile run. The actigraph, worn like a watch, tracks the movement of the wearer during sleep and monitors the quality and amount of sleep the participant receives. To confirm the accuracy of the sleep device, several of which are owned by James Madison University's Department of Psychology, the cadets would also complete a paper sleep log to track their sleep hours.

Procedure

There would be two separate experiments within the procedure. The entire experiment would be an ABA design in which the 40 cadets in the test group would take an initial baseline test (condition A), experience a new condition (condition B), and then be returned to the original condition (condition A). There will be two independent variables (IV) manipulated (hours of sleep and independent fitness regimen) and four dependent variables (DV) measured (motivation, group cohesion, fitness test score, and the level of risk behavior). Once consent forms are distributed, signed, and collected, the selected cadets would take the surveys and APFT in order to have a baseline score for later comparison. Afterward, the cadets will be randomly assigned to one of ten groups of four cadets in each group. The groups will be this size to allow for easier scheduling and more potential for more

camaraderie. Each group would undergo the following procedure.

Sleep manipulation. The members of each group would be required to alter their sleep schedules by getting at least seven hours of sleep per night (during the school week), going to bed no later than midnight, and waking up no earlier than 7 a.m. (to be confirmed by the sleep journal and actigraph). This change would give the cadets an extra ten hours of sleep throughout the school week (not including the weekends). Additional sleep, whether from naps or longer sleep time at night, would be permissible. The cadets would be expected to continuously wear the actigraph and keep their journal up to date and accurate; moderators would check these weekly. Cadets not following the experiment requirements would be removed from the experiment and returned to the original PT schedule.

Fitness manipulation. The ROTC program would need to excuse cadets participating in the study from Battalion Physical Training (PT), and it would be the responsibility of the ten groups to create their own PT plans and have them approved by ROTC cadre before beginning the experiment. Each group would be required to take attendance at these sessions and document that

Permitting each group to
create its own workout
fosters responsibility,
creativity, and teamwork

PT was conducted. The restrictions for their plans would be as follows: it must be a group PT plan, they cannot meet during the already scheduled PT hours (5:50 a.m.–7 a.m.) because they should be sleeping, the workouts must be held at least three times a week, and the workouts cannot exceed one hour. The cadets could utilize any location, conduct any workout, and meet at any time they would like, as long as it is after 7 a.m. and it has prior approval. Although this allows for inconsistency, permitting each group to create its own workout fosters responsibility, creativity, and teamwork. Additionally, by testing different workouts using the APFT, the ROTC program can determine which ones are most effective, and since all workout plans must have prior approval, groups cannot conduct subpar workouts.

Reincorporation. At the end of the 30 days, every cadet in the battalion (including the group of 40) would be tested on the APFT. The sleep intervention group would retake the YRBSS, the APFT, and the initial survey that measured motivation/cohesion. The sleep intervention group would then be incorporated back into Battalion PT for another 30 days. They would continue to wear the actigraph and record their sleeping hours in the journal. At the end of the 30 days in the original condition of only getting approximately five hours of sleep per night, the 40 sleep intervention participants would once again be

tested on the APFT and surveys to determine whether there was a shift toward or away from the baseline. Overall, the duration of the experiment would be 60 days.

Data Analysis

The collected data would consist of the survey results, the total amount of sleep cadets had in both conditions, and the APFT results of all the cadets. To analyze the data, SPSS software would be used to identify all descriptive statistics and run a regression between the baseline and reintegration condition to see if there was a change after the first 30-day period and a return to the original condition after the second 30-day period. A factor analysis and correlational tests would be conducted between sleep and motivation, group cohesion, and YRBSS for the group of 40 cadets. The fitness scores for the group of 40 would be compared to the entire battalion's scores and evaluated using a 2x2x4 repeated measures ANOVA with an alpha level of .05.¹

Justification

The JMU ROTC's Commander's Intent states that one goal of the program is to "develop officers who are critical thinkers that recognize when to apply theory and doctrine to real life situations." In Army Field Manual (FM) 6-22.5 (2009), which focuses on sleep deprivation among Army soldiers, Table 4-1 states that "ideal sleep period equals 7 to 8 hours of continuous and uninterrupted nighttime sleep each and every night. . . . Anything less . . . will result in some level of performance degradation" (p. 4-2). Section 4 in the doctrine begins by stating that "this guidance . . . applies to all levels of military operations, to include both training and tactical environments. Unit sleep plans should be based on this guidance" (p. 4-1). The negative effects of sleep deprivation combined with the potential for a high-stress environment can lead to a higher risk of mental illness. The Army has an epidemic on their hands: in 2012, mental health care was responsible for 40% of the military's hospital-related costs and is one of the most significant causes of lost military duty (Crowley et al., 2012). The Army does not need to commission cadets who are that much closer to being added to this statistic because they are chronically sleep deprived prior to even officially joining the Army.

It is important to note that there is only one way to overcome sleep deprivation, and that is to actually get sleep. FM 6-22.5 (2009) addresses two big assumptions and misconceptions occurring within the Army: that sheer willpower can overcome the struggles associated with sleep deprivation and that adequate levels of performance can be maintained with only four hours of sleep per night. The manual states that sheer determination or willpower cannot offset the

mounting effects of inadequate sleep and that sleeping for only four hours a night for five or six consecutive nights (the sleep patterns of many cadets) causes just as much impairment as remaining awake for 24 consecutive hours (p. 4-6).


To allow for more sleep for the cadets, more effective workouts, and enhanced group camaraderie, a vision for an altered PT schedule has been proposed. Based on FM 6-0 (2014) standards, it is believed that the proposal is suitable, feasible, acceptable, distinguishable, and complete. If it is found that the behavior, motivation, and group pride of the cadets in the experimental group changes significantly from the extra hours of sleep and a new PT regimen, then the entire program would benefit by replicating the experiment on a larger scale. If the cadets' fitness scores are improved due to the different exercise regimen and sleep schedule, it would demonstrate that the cadets are risking sleep deprivation without any benefit and that PT is more effective at the squad level and after at least seven hours of sleep. If positive benefits were found in JMU's program, it would be suggested that at least three other colleges or universities replicate this study because these results could carry the potential to change the ROTC program structure on a national level.

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1. ANOVA stands for analysis of variance and is used in this case to measure how the same subjects respond (the dependent variables) to the changes made (independent variables). The ratio of the differences measured between the two groups of cadets will be compared to the alpha level of .05 to determine if there are significant enough differences to suggest a correlation between the new fitness program and the level of fitness measured.

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The Contact Hypothesis and the Diffusion of Public Opinion toward Undocumented Latino Immigrants in the United States



Sawyer Hackett

Negative and positive attitudes between population in-groups and out-groups are matured through a variety of experiences, chief among them being the extent of interaction between the two groups. The contact hypothesis observes the extent of interaction between in-groups and out-groups—distinguished by a particular demographic descriptor—and asserts that the extent of the two groups’ interaction is positively correlated with favorable attitudes directed toward the out-group. This research analyzes the potential effect that the undocumented Latino immigrant population has on the sentiments of the established native population. In addition to attitudes toward the undocumented Latino population, the importance that U.S. residents place on the issue of citizenship for undocumented immigrants and their preferred reform policies regarding undocumented immigration were also measured. This study has implications for the ongoing debate surrounding immigration reform and helps to explain the way in which geography affects political opinion on immigration.

Introduction

Research involving immigration, especially undocumented immigration, focuses on the economic, social, and demographic effects stemming from an influx of large quantities of immigrants. Defining how these immigrants fit within the existing political, economic, or cultural frameworks has particular appeal to those who study societal trends. The desire to determine immigration's effects most likely stems from the general public's lack of knowledge regarding the estimated number of incoming immigrants, as well as a sense of uncertainty concerning the effect of this number on their daily lives. Does the introduction of a large number of immigrants have an effect on a community's existing political culture, economic well-being, or overall social capital? The answer to this question has implications to researchers and residents alike.

In studies of resident and immigrant relations, the existing group that occupies a geographic location is referred to as the in-group, while the out-group is the demographic population that is migrating to that location. In this study the native residents who populate the United States comprise the in-group, and the undocumented, foreign nationals of Latino descent migrating to the U.S. comprise the out-group. Although the in-group includes different ethnicities, ages, genders, and socioeconomic levels, the natives share the key component of a common legal classification as documented residents of the U.S.

Unsurprisingly, prejudice in varying degrees of intensity is often present between in-groups and out-groups. The contact hypothesis offers an explanation for this variation, asserting that under normal conditions, interaction between the two groups tends to diminish prejudice, pre-existing stereotypes, and perceived levels of competition by producing positive experiences. The contact hypothesis helps to clarify social tolerance for migration and may explain individuals' preferred policy prescriptions for political disputes that arise from immigration. Individuals with positive feelings toward immigrant out-groups, due to increased contact, may prefer less punitive policy prescriptions, while those who have had less contact with immigrants may prefer harsher policies. In addition, this hypothesis may give credence to the idea that elected officials representing areas with high immigrant and Latino populations take a sympathetic stance on immigration issues and tend not to take hardline punitive positions on deportation. This concept is particularly relevant given that these officials lead the charge on local, state, and national reforms.

Literature Review

The contact hypothesis, also known as intergroup contact theory (Hood III and Morris 1998, 3), is more apt to draw conclusions on a community-wide population rather than on individual levels. The theory suggests that "an increase in size of the racial or ethnic minority group is likely to have a positive effect on the attitudes of the dominant group, because members of the different groups may have more opportunities to interact with each other" (Berg 2009, 43). Furthermore, antagonistic in-group members may develop negative expectations for potential interaction and will therefore avoid contact (Hood III and Morris 1998, 3). This lack of contact will then prevent future positive interactions with the out-group, promoting isolationist sentiments. For instance, the contact hypothesis asserts that perceived labor market competition posed by undocumented Latino immigrants may be mitigated by positive intergroup interactions. However, if either group avoids intergroup relations, then negative perceptions may remain. Nativist attitudes—or attitudes that align with natives' opinions—may be altered by way of positive interactions with an out-group.

In addition to using the contact hypothesis to explain native inhabitants' opinions toward undocumented Latino immigrants, researchers have explored other theoretical explanations, including the concept of threat (Berg 2009, 42). Berg notes that threat is a sentiment that stems from competition created by minority out-groups, such as labor market competition or political ramifications in elections. In contrast, the contact hypothesis "suggests that an increase in the size of the racial or ethnic minority group is likely to have a positive effect on the attitudes of the dominant group" (43). While threat tends to measure effects on the individual, the contact hypothesis observes community-wide trends. Further, economists usually study cases of threat, while sociologists or political scientists investigate the contact hypothesis. Therefore, this research will use a survey to examine sentiments of people living in high and low immigrant populations in the U.S. to investigate the validity of the contact hypothesis.

While the contact hypothesis proposes that increased interaction with immigrant populations correlates with positive attitudes toward immigrants, additional data have been collected in an effort to examine how an influx of Latino immigrants affects a community through the variety of potential threats that each individual native will experience. For example, whites in native communities who hold relative "power"—whether economic, political or social—might experience tension or feelings of animosity toward immigrants who could threaten their current predominance (Berg 2009). Under these circumstances, in-groups may develop attitudes of insecurity concerning

Prejudice in varying degrees of intensity is often present between in-groups and out-groups

previously held means, which may then be directed toward the out-group (McLaren 2003). For example, the presence of new populations that are able to compete for jobs held primarily by in-group members fosters tension among the native population. Undocumented immigrants may present competition in the form of cheaper labor given their lack of protection from minimum wage and other labor laws in a jurisdiction. As such, labor market competition is most likely to affect the lowest socioeconomic groups and produce the highest levels of negative attitudes among lower socioeconomic classes (Berg 2009, 42). While the contact hypothesis examines more general sentiments across a community-wide consensus, evaluating perceived threats, such as labor market competition, is still important when examining overall community attitudes.

The contact hypothesis has been studied in various racial group interactions, primarily focusing on how the size of different racial groups within a population affects people's behaviors or feelings. A study by Oliver and Wong (2003) states "in neighborhood contexts, interethnic propinquity corresponds with lower levels of out-group prejudice and competition, although intergroup hostility is higher in metropolitan areas with greater minority population" (567). Fundamentally, Oliver and Wong found that lower levels of prejudice are associated with diverse neighborhoods where different races are expected to interact. Concurring with Oliver and Wong's proposition, Berg concludes in his 2009 study that "whites who live in areas with more Latino residents are more likely to be comparatively sympathetic to undocumented immigrants, arguably due to the greater frequency of intergroup interaction with native-born Latinos and Latino immigrants" (49). To explain the intergroup hostility sometimes found in more urban areas, Oliver and Wong (2003) conducted additional tests, concluding that negative sentiments toward out-groups originate from an isolationist outlook, rather than from a self-selection process. For example, those who may have strong prejudicial feelings toward out-groups are more likely to seek out neighborhoods and geographic locations that are segregated (577).

However, even among the narrow field of immigration research, the contact hypothesis is controversial and subject to a variety of critiques and nuances (Hood III and Morris 1998, 3). This controversy has incited many to call for a new theory to explain how in-group opinions are developed (Jackman and Crane 1980). Given that much of the literature on the contact hypothesis was written during the tempestuous years of the 1960s and early 1970s, it should come as no surprise that a modern alternative theory has been proposed. (Sigelman and Welch 1993, 782). In contrast to Berg's 2009 findings, results from a 1998 study by M.V.

Hood III and Irwin L. Morris conclude that "as the relative size of the undocumented migrant population increases, Anglo support for increased immigration decreases" (1). These results reflect either a disagreement with the contact hypothesis or a change in in-group reactions over time.

Additionally, a majority of the research collected in the past 50 years has measured racial hostilities between whites and blacks. Although these results may relate indirectly to Latinos, the contact hypothesis is more difficult to support and investigate due to the potential undocumented status of some Latinos. The introduction of a legal status that some deem in need of reform may provide justification for negative feelings toward undocumented immigrants. Research from 1998 by Hood III and Morris may have bypassed these criticisms by incorporating undocumented immigrants in their study (6). These researchers found that white support for increased immigration is positively related to the size of the documented immigrant population but negatively related to the undocumented population. However, their research is only marginally relevant to the scope of this

paper because it related support for increased immigration to the size of the documented and undocumented population, rather than solely examining tolerance levels toward undocumented migrants.

Even in the narrow field of immigration research, the contact hypothesis is controversial

Although researchers who study the contact hypothesis may have sustained the theory itself, inconsistency has appeared in their findings, and a synthesis of the various threats presented to the out-group resulted in the notion of the realistic group conflict theory (RGCT) (Hood III and Morris 1998, 3). RGCT declares, much like the labor market theory, that "competition for scarce resources—economic, social or cultural—leads to conflict among groups" (Hood III and Morris 1998, 3). According to RGCT, as competing groups become closer in geographical location, they will exponentially accentuate conflict (Hood III and Morris 1998, 3). As a result, positive relations between the two groups can only be advanced when the groups in question are not contesting over the same resources.

Aggregate research on the contact hypothesis has not systematically proven that a causal relationship between intergroup interaction and attitudes toward immigrants exists, nor has a correlation been established. This study will attempt to measure opinions directed toward undocumented Latino immigrants by using selected states in the U.S. as the measurable geographic descriptor of in-group members. With the exception of antagonistic in-group members who may seek isolation via segregated habitation, measuring this theory at the state level allows for the opportunity to easily examine in- and out-group interaction from compiled statewide data. Additionally,

state-level observation allows the researcher to compare states' political philosophies in order to frame outcomes. To see if ethnicity plays a factor in opinions toward undocumented Latinos, a distinction between resident Latinos and non-Latinos will be made. Furthermore, this research will attempt to measure preferred methods of immigration reform based on the principles of the contact hypothesis, particularly whether those who may have had less contact with out-group members prefer certain punitive reforms.

Theory and Hypotheses

Hypothesis 1: The presence of a significant population of undocumented Latino immigrants will have a positive effect on tolerance levels of in-group members toward the undocumented population, as well as the levels of importance placed on immigration issues. Derived from the central tenets of the contact hypothesis, this hypothesis assumes that border state residents will feel that the issue of citizenship for undocumented immigrants is more important than the residents of non-border states, given that these are the states with a higher undocumented immigrant populations.

Hypothesis 2: Concerning the test on preferred public policy, border state residents will feel that a work period allowing undocumented immigrants to remain in the U.S. for three years is more favorable than non-border state residents will feel. Conversely, residents of non-border states will favor strengthening border security more than those who live in border states due to a federal work period that champions reforming immigration laws in a way that may be less punitive than increasing border security.

Data Methodology

This research will not attempt to expound on the competing theories explaining nativist sentiments from in-group members, but will highlight and draw conclusions relating to the contact hypothesis using survey data and data derived from the Statistical Abstract of the United States, a publication put together using U.S. Census information. Specifically, the researcher will demonstrate whether a sample of residents from border and non-border states places importance on undocumented immigration. Additionally, this research will outline this sample's attitude toward public policy, such as a government work program for undocumented immigrants and the strengthening of border security. The states of residence will be the only geographical descriptor, stratified as high and low Latino immigrant states, and will help to examine levels of importance for immigration issues perceived by both the white and nonwhite native populations of those locations.

The level of importance that native citizens place on undocumented immigration helps to assess the desire for specific types of government intervention (in this study: a work period and improving border security) to deal with increasingly high levels of undocumented immigration. To measure the desire for the type of government intervention, survey data from U.S. states differentiated based on the relative size of the Latino population residing within them will be cross-examined to determine how the various populations rate importance of citizenship for undocumented immigrants. The sample of residents will also be asked to conduct a thermometer test based on undocumented immigrants, placing a numerical value on their feelings toward this group. Finally, data will also be gathered from the same sample to measure the appeal of various public policies addressing immigration issues.

Limitations include the assumption that individuals in the denoted states have interacted with the undocumented Latino population. However, the shortcomings of choosing a state-level geographical descriptor are not overcome by choosing a more specific designation such as that of a town or village because recorded interaction is still not measured. As Berg noted, the contact hypothesis studies the likelihood for intergroup contact, and individuals have a higher chance of contact by residing in a state with a larger undocumented immigrant population (2009). While focusing in on the town or village level may give insight to specific threats perceived by natives in areas more heavily populated by immigrants as explained by the realistic group contact theory, such examinations are outside the scope of this study's work.

This study will highlight how the contact hypothesis is useful in gauging support for certain forms of public policy, be it a more beneficial worker program for undocumented immigrants or a more punitive policy of strengthening border security. Although both of these policies could be implemented independently or simultaneously, the results of this particular test will help to demonstrate how the contact hypothesis may determine favorability with regard to certain reforms. Additionally, these findings are particularly relevant to the debate on immigration reform taking place nationally. If a relationship between intergroup interaction and public support is clearly established, policy makers and academics will have a better understanding of how public opinion is developed on immigration issues.

Research Design

The data for undocumented immigrant populations residing in each individual state were obtained through the United States Census of 2012. In 2013, the Center for Immigration Studies gathered information from the

The contact hypothesis may determine favorability with regard to certain reforms

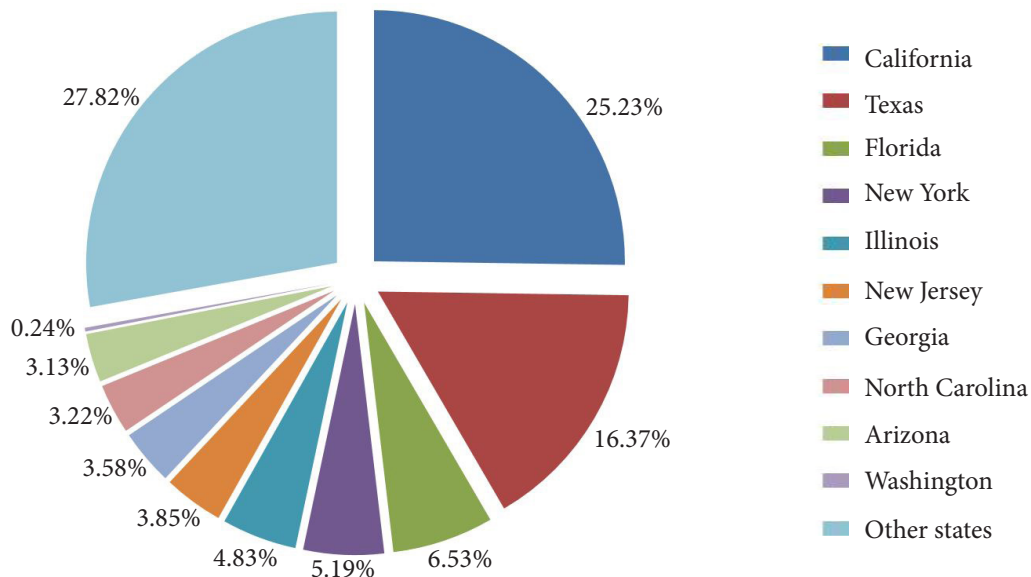


Figure 1. States' respective percent of total undocumented immigrant population. The total U.S. undocumented population was 11, 430,000 in 2013. Data from U.S. Department of Homeland Security, Center for Immigration Studies 2013.

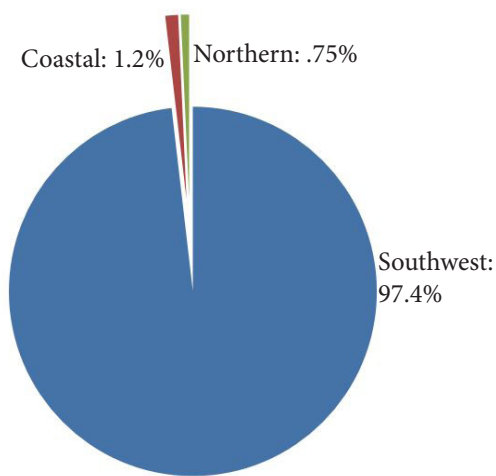


Figure 2. U.S. Border Patrol apprehensions by border from 2005–2008. Data from U.S. Department of Commerce, Statistical Abstract of the United States 2012.

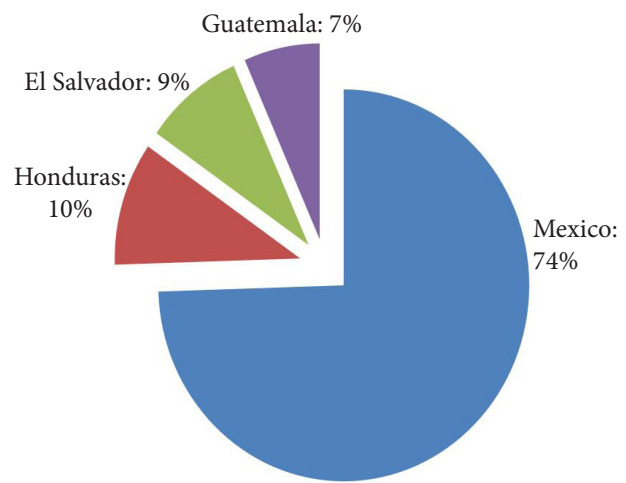


Figure 3. U.S. Border Patrol apprehensions by border from 2005–2008. Data from U.S. Department of Commerce, Statistical Abstract of the United States 2012.

Department of Homeland Security that estimated the population of undocumented immigrants was 11.4 million in January 2012; approximately 50% of these immigrants reside along the southern border of the U.S. (figure 1). The 2012 Statistical Abstract of the United States estimated that in 2008 the U.S. Border Patrol apprehended 723,840 immigrants, 97.4% of which were apprehended in the southwest region of the U.S. (figure 2). For this reason, this study will examine the distinction between states that lie on the southwest border (California, Arizona, New Mexico and Texas, as well as Florida, which draws in many South American migrants) (figure 3) and all other American states. This distinction will be cross-examined with the various dependent variables that have been identified: feelings of tolerance, perceived importance of citizenship,

opinion toward punitive policy, and stance on immigration policy.

To weigh the subjects' state of residence and survey responses against immigration issues, this study will incorporate data from the National Election Survey of 2008, as well as the Council of Foreign Relations 2008 datasets, which incorporate demographic information such as state of residence, gender, and race. To classify individuals as border versus non-border state residents, the researcher will recode all responses of border states (CA, AZ, NM, TX, and FL) to give them a value of one. All other state responses will be given a value of zero. This variable will then be cross-examined in a series of figures as the independent variable for each test.

The first dependent variable measured is a feeling thermometer of in-group members toward undocumented immigrants, which measures “hot or cold” feelings on a scale of 0 to 100. The 2,048 responses were recoded with intervals of 0–33 degrees (low tolerance), 34–66 degrees and 67–100 degrees (high tolerance) and were examined against the independent variable (state of residence). As a control for this test, a recode was completed to account for the “race of respondent.” Latinos were given a value of one, while all other races were given a value of zero, leaving categories of Latino and non-Latino. Although this control was not reproduced in the other tests, it provides additional context for how Latino citizens may feel about undocumented Latino residents. This variable gives additional salience to the contact hypothesis as it relates to the ongoing debate on immigration. If non-Latino border state respondents reported significantly higher thermometer levels toward undocumented Latino immigrants, the contact hypothesis would be more compelling across racial group comparisons.

The second dependent variable measured determines whether or not the respondent feels that citizenship for undocumented immigrants is an important issue. To measure this, a recode was performed for all answers of “extremely important,” “very important,” “moderately important,” and “slightly important” into one category of importance with a value of one. The other category, “not important at all,” was given a value of zero, and all other values were placed as missing. This recode was performed to funnel any answer that indicated the importance of citizenship for undocumented immigrants into one singular response. This test may not provide a perfect representation of the importance of citizenship for undocumented immigrants to the subject, but it does divide the respondents’ answers to create a clear distinction.

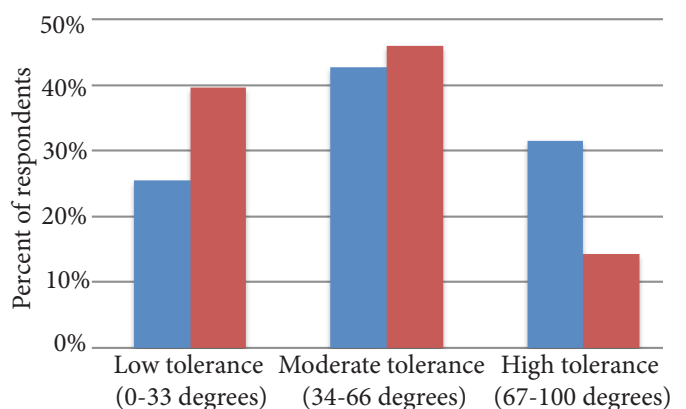
The third dependent variable measured determines whether respondents favor or oppose a three-year work period for undocumented immigrants, a possible policy to mitigate potential negative labor effects of undocumented immigration. For this variable, all missing values including “don’t know,” “refused,” and “neither favor nor oppose” were removed, and “favor” or “oppose” were left as the two possible choices.

The fourth and final dependent variable measured results from a test that determines whether the respondent thinks improving border security is important in the U.S. Two responses, “very important” and “somewhat important” were put into one category of “important,” and the responses “not very important” and “not important at all” were put into one category of “not important,” and missing values were excluded. This test highlights whether respondents from border and non-border states think it is important to improve border security, as opposed to another possible policy prescription to fix the immigration system. This test

is not mutually exclusive from other policies, but does test a measure that is more punitive than others, such as a work period or amnesty.

Results

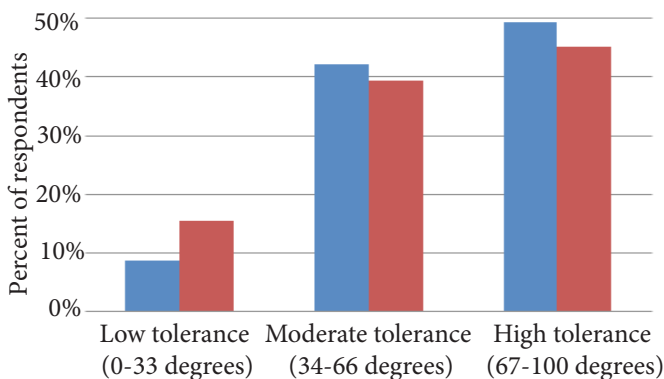
In the first test, a feeling thermometer survey was conducted on the 2,048 respondents’ attitudes toward undocumented immigration (figure 4). This test found that among the 824 people that reside in border states, 25.6% of respondents had a low tolerance (0–33 degrees) for undocumented immigrants, 42.8% had a moderate tolerance level (34–66), and 31.6% had a high tolerance level (67–100 degrees). Among the 1,224 that reside in non-border states, 39.7% had a low tolerance of undocumented immigrants, 46.0% had a moderate tolerance, and 14.3% had a high tolerance. In this test, not only did non-border states have a greater number of individuals with lower tolerance toward undocumented immigrants, but there were also greater numbers of border state residents with a higher tolerance for undocumented immigrants compared to non-border state residents. Given the indicators of statistical significance in this test, it is reasonable to assume that a relationship between a higher population of undocumented immigrants and a higher tolerance for undocumented immigrants exists. This test is compelling for the proponents of the contact hypothesis, as it shows that a higher potential for interaction with immigration populations may also indicate a potential for higher levels of acceptance or positive feelings toward undocumented immigrants.



Statistical significance:
 Chi-Square: 98.902;
 2 degrees of freedom
 Gamma: -.343
 Kendall’s tau-c: -.216
 Somer’s D: -.193

Figure 4. Feeling thermometer survey showing tolerance among all respondents for undocumented immigrants by state classification.

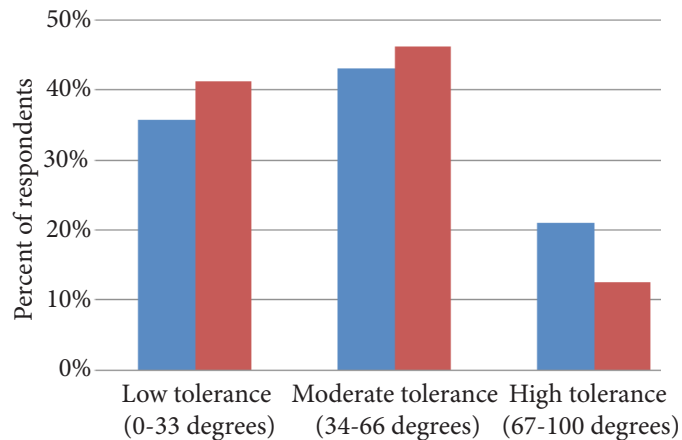
When controlling for ethnicity (distinction between Latino and non-Latino) in the thermometer test, the results were less pronounced. Among the 302 people who are Latino and live in a border state, 8.6% had a low tolerance of undocumented immigrants, 42.1% had a moderate tolerance, and 49.3% had a high tolerance. Among the 71 people who are Latino and reside in a non-border state, 15.5% had a low tolerance of undocumented immigrants, 39.4% had a moderate tolerance and 45.1% had a high tolerance (figure 5). Among the 517 people who are non-Latino and reside in a border state, 35.8% have a low tolerance for undocumented immigrants, 43.1% have a moderate tolerance and 21.1% have a high tolerance. Among the 1,145 people who are non-Latino who reside in non-border states, 41.2% have a low tolerance of undocumented immigrants, 46.3% have a moderate tolerance, and 12.5% have a high tolerance (figure 6).



Statistical significance:
 Chi-Square: 3.056;
 2 degrees of freedom
 Gamma: -.123
 Kendall's tau-c: .046
 Somer's D: -.051

Figure 5. Feeling thermometer survey showing tolerance among Latinos for undocumented immigrants.

This test demonstrates that respondents who are of Latino descent have a generally more positive disposition toward undocumented immigrants than those who are of non-Latino descent. For both border and non-border state residents, more Latinos felt greater tolerance for undocumented immigrants than non-Latinos. It is also noteworthy that Latino citizens residing in border states were more likely to have more positive attitudes toward undocumented immigrants than their non-border state counterparts. The purpose of controlling for Latino ethnicity in this test was to determine if the relationship between border state residents and higher tolerance levels would still be statistically significant if the Latino citizen population was removed from the survey responses. Because the results still display a statistically significant difference, it helps to strengthen the arguments made by the contact hypothesis. This test provides crucial support



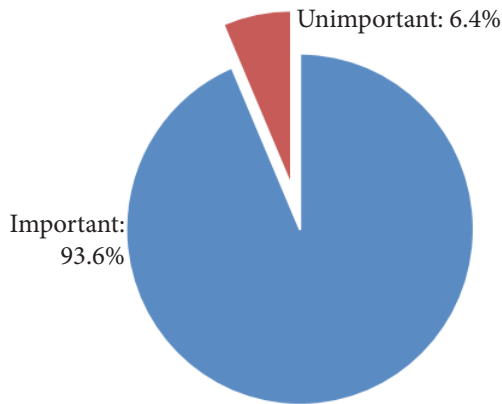
Statistical significance:
 Chi-Square: 20.798;
 2 degrees of freedom
 Gamma: -.157
 Kendall's tau-c: -.084
 Somer's D: -.081

Figure 6. Feeling thermometer survey showing tolerance among non-Latinos for undocumented immigrants.

for the tenets of the contact hypothesis as it dismisses any potential limitations of the original test due to possible ethnic bias of respondents.

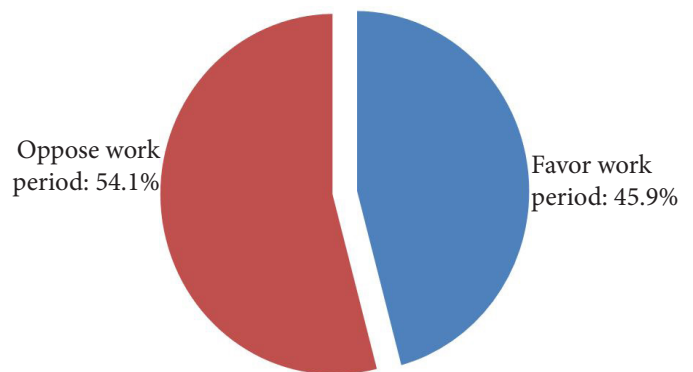
The second test was used to determine the importance placed on citizenship for undocumented immigrants by native residents in border and non-border states. Among the 482 residing in border states, 93.6% believed that citizenship for undocumented immigrants is of some importance and 6.4% said it is of no importance (figure 7). Among the 677 living in non-border states, 89.8% believed that citizenship for undocumented immigrants has some importance and 10.2% believed it has no importance (figure 8). These percentages indicate that more border state residents found citizenship for undocumented immigrants to be important than non-border state residents did. Regardless, because the difference between the two groups is slight, this test could not be classified as statistically significant, making it unable to adequately support the second half of the first hypothesis.

The third test sought to determine whether residents of border and non-border states favor or oppose a work period for undocumented immigrants. Among the 368 residing in border states, 45.9% favor a work period and 54.1% oppose it (figure 9). Among the 546 residents of non-border states, 29.3% favor a work period and 70.7% oppose it (figure 10). This test shows that a higher percentage of border state residents favor a work period for undocumented immigrants compared to non-border state residents; conversely, a higher percentage of non-border state residents opposed that same work period compared to border state residents. Because the test shows



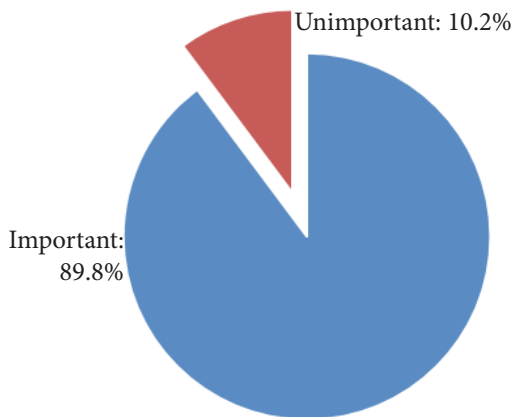
Statistical significance:
 Chi-Square: 5.05; 1 degree of freedom
 Lambda: .000
 Phi: .066
 Cramer's V: .066

Figure 7. Percent of border states that believe citizenship for undocumented immigrants is an important issue.



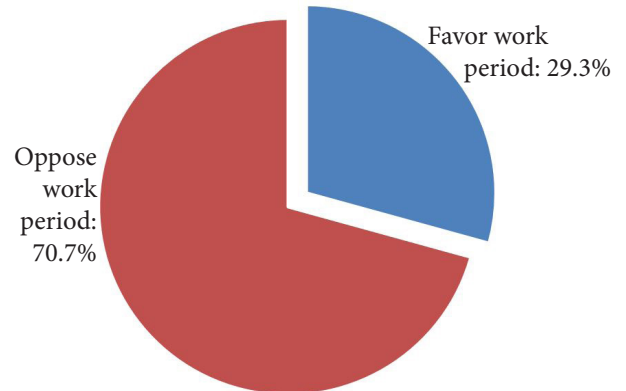
Statistical significance:
 Chi-Square: 26.357; 1 degree of freedom
 Lambda: .013
 Phi: .170
 Cramer's V: .170

Figure 9. Opinions of border state residents on work period for undocumented immigrants.



Statistical significance:
 Chi-Square: 5.05; 1 degree of freedom
 Lambda: .000
 Phi: .066
 Cramer's V: .066

Figure 8. Percent of non-border states that believe citizenship for undocumented immigrants is an important issue.



Statistical significance:
 Chi-Square: 26.357; 1 degree of freedom
 Lambda: .013
 Phi: .170
 Cramer's V: .170

Figure 10. Opinions of non-border state residents on work period for undocumented immigrants.

that border state residents tend to favor a less punitive measure for undocumented immigrants more than non-border state residents, it supports the second hypothesis and underscores that the contact hypothesis may prove that interaction with undocumented immigrants may promote positive feelings toward programs that are less punitive toward immigrants.

The fourth test was used to determine whether residents of border and non-border states believe that improving border security is important (figure 11). Among the 267 residents of border states, 80.5% believed that it is important to improve border security and 19.5% believed it is not important. Among the 745 people residing in non-border

states, 87.2% believed that improving border security is important and 12.8% believed that it is not important. This test indicates that a greater number of non-border state residents thought that improving border security is important than residents of border states. On the contrary, a larger number of border state residents asserted that improving border is less important than residents of border states. However, this test is not statistically significant and does not provide adequate support for the second half of the hypothesis. Additionally, it cannot serve as an authoritative determinant on the degree of punitive reform that respondents prefer as it did not account for multiple reforms in one response. For example, respondents may have favored a combination of flexible and punitive policy

prescriptions on immigration issues, such as a preference for amnesty for undocumented immigrants currently residing in the U.S. and a strengthening of border security. Furthermore, this test asked respondents to assess whether they support strengthening border security, which is not a comprehensive measure of punitive reforms, but merely gives a general outlook on one policy.

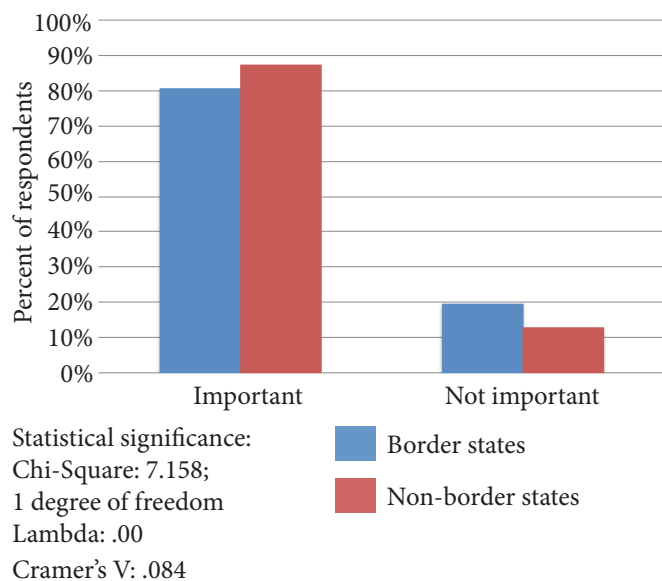


Figure 11. Is strengthening border security important?

Conclusion

The contact hypothesis theorizes the way in which intergroup interactions affect in-group sentiments toward the out-group in question. More specifically, the theory suggests that these interactions have the ability to produce favorable attitudes between one another through repeated interaction. This hypothesis has held up modestly under scrutiny, with additional testing and application to a number of social, cultural, and racial groups failing to reliably uncover a causal relationship. To test the contact hypothesis in a new way, researchers can evaluate the theory in regards to groups with different ethnic and legal classifications. Given the presence of undocumented Latino immigrants in the U.S., this research has attempted to study the contact hypothesis as it pertains to individuals' attitudes toward the role of government, personal responsibility, and legal ramifications concerning this population. To quantify the information studied, a geographic descriptor was applied to the survey subjects based on which U.S. state they reside in. The descriptor was also useful when determining opportunities for interaction between in-group and out-group members, or the interaction between U.S. citizens of particular states and the undocumented Latino population residing within them in the context of this research.

The first test suggested with statistical significance that residents in states characterized by high levels of undocumented Latino immigrants are also characterized by a propensity for higher tolerance for those same

undocumented immigrants. Even when controlling for ethnicity of respondents, this test surpassed the necessary critical statistical values. The test was also performed on the controlled and documented Latino respondents, with the corresponding results suggesting that state of residence had implications for tolerance levels toward undocumented Latinos as well, although these results were not statistically significant. The second test examined the level of importance that respondents placed on citizenship for undocumented immigrants. Although the results of this test indicated that subjects living in border states may place more importance on citizenship than subjects living in non-border states, the results were not statistically significant and were therefore less compelling than the findings of the first test.

Two tests were conducted on favorability of certain policy reforms, namely a work period that would allow immigrants to reside in the U.S. for three years, and the strengthening of border security. The former, less punitive measure, was more preferred by border state respondents than by non-border state respondents. The latter, which was not statistically significant, is a more punitive policy that was preferred by respondents residing in non-border states more so than those living along the border. Although this test was not able to conclusively prove the second hypothesis, it does highlight differences within sample respondents, which may become more pronounced with a larger sample. These results could have implications for public opinion and policy prescriptions related to undocumented immigration issues.

Although it has produced fluctuating results with varying social groups, the contact hypothesis may expose a societal force for positive sensibility. Problems related to isolationism, segregation, and racism may be mitigated by the interaction between an apprehensive in-group and the out-group of its negative attitudes. More compelling, however, is that the the contact hypothesis may have political implications from this type of study, potentially providing explanation as to why citizens of certain areas in the U.S. feel a particular way about undocumented immigration, and which policies are preferred by the general public. Additional research into this theory will be critical as the debate on undocumented immigration continues. Political campaigns at the national level will incorporate policy platforms and messaging based on the general desire for reform. With the number of undocumented Latino immigrants continually growing and settling in new areas across the country, this desire should continue to grow.

The results of this type of research show that positive public opinion may be bolstered with the continued growth of the undocumented population, pushing less punitive reforms and policy platforms forward. Campaigns may also have interest in wielding this data on a localized basis, altering their messages based on areas of the country that politicians

visit or in which they need higher approval ratings. Areas with high undocumented populations have already seen politicians who are comparatively more sympathetic than the rest of their respective party on immigration issues, and with the size of the undocumented population continually growing, the number of elected officials endorsing less punitive reforms such as work periods and amnesty should continue to grow.

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Bacteriophages: The Answer to Antibiotic Resistance?



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Bacteriophages, viruses that infect bacteria, have numerous applications in the medical, agricultural, and research fields, especially as an alternative to antibiotics in the age of antibiotic resistance. Phages are able to lyse, or break apart, bacterial cells with fewer side effects, more specificity, and less likelihood of resistance than antibiotics. The acceptance of phages in medicine and agriculture around the world today is not universal, and the United States Food and Drug Administration (FDA) has been slow to recognize phage therapy as a legitimate treatment. However, the successful use of phages in the past, as well as promising trial results in fields ranging from chronic disease treatment to food preservation, present opportunities for consideration of phage-based applications in the future. The goal of this paper is to provide an overview of the history, uses, and regulation of phage therapy.

Introduction

If you were to walk out into your backyard today, you probably wouldn't notice the thousands of tiny microorganisms living there right underneath your feet. Many of these microorganisms would be bacteria, but at least ten times as many would be their viral predators (Hattful, 2008). These bacteria-infecting viruses, called bacteriophages or "bacterium-eaters," were discovered in 1910 by Felix d'Herelle, a French-Canadian microbiologist (Golkar, Bagasra, & Pace, 2014). One example of a bacteriophage is shown in Figure 1. They can be found almost anywhere on Earth and are a topic of increasing study, especially due to the dramatic rise of antibiotic resistance. Bacteriophage research is conducted worldwide in an effort to combat this resistance and address a variety of health issues, ranging from chronic diseases to safety in the food industry.

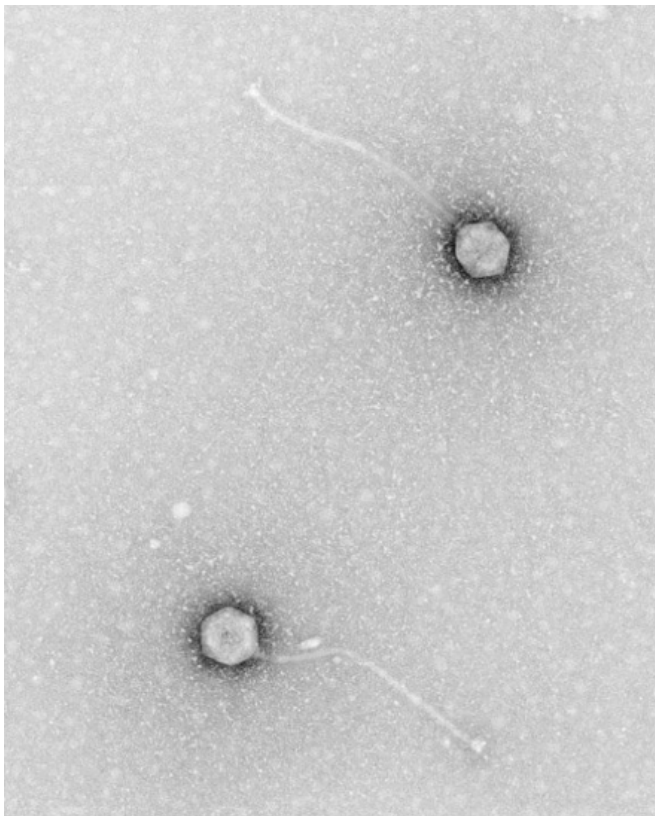


Figure 1. An electron micrograph image of a siphovirus isolated by Isabel Jimenez-Bush from a soil sample in a JMU Viral Discovery class. Note the icosahedral head along with the long flexible tail.

History of Phage Therapy

The use of bacteriophages to treat pathological bacterial infections, called phage therapy, began in France in 1919. By the 1930s, phage therapy was in use in Europe and the United States (Highfield, 2014). After the introduction of antibiotics, however, phage therapy became virtually obsolete everywhere except Eastern Europe and the Soviet Union. The decline in phage therapy was the result of multiple factors, including the cessation of research

communication between Eastern Europe and the Western world during World War II and the counterintuitive nature of using viruses to treat diseases (Summers, 2012). In addition, the difficulty in regulating a virus as a therapeutic agent is still a major barrier.

During World War II, the Allied and Axis powers differed in regard to method of treatment for bacterial infections. While German scientists studied phages, the Allies were heavily dependent on antimicrobial drugs like penicillin and amoxicillin (Summers, 2012). The efficacy and speed of these pharmaceuticals were a major breakthrough in the medical industry, surpassing the still-developing phage therapy. Antimicrobial drugs were produced in great quantities, rendering phage therapy virtually obsolete. Recently, the emergence of bacterial resistance to antibiotics has caused researchers to seek alternative methods of treatment (Yosef, Kiro, Molshanski-Mor, Edgar, & Qimron, 2014).

Although ignored for several decades in the West, the decline of phage therapy was neither uniform nor complete, as evidenced by its continued use in the Republic of Georgia by the Tbilisi Institute (Kutateladze & Adamia, 2008). No substantial research or well-documented practice of phage therapy arose for the next 40 years; however, in the last few decades phage therapy research has reemerged in the Western world to combat the urgent problem of antibiotic resistance.

Current Uses and Future Applications of Phages

While many phage treatments are not yet supported by the United States' Food and Drug Administration (FDA), research has shown phages to be beneficial in areas like food preservation, agriculture, livestock health, and the treatment of human infections. Several uses that will be discussed include overcoming antibiotic resistance, sterilizing medical equipment, and treating agricultural products.

A promising technique for overcoming antibiotic resistance involves using specific proteins from phages that lyse bacteria, and can be isolated and used to treat bacterial infections. Phage therapy significantly increases the ability to combat antibiotic resistance in bacteria such as *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, and *Escherichia coli* with 90% efficiency (Pirisi, 2000). These bacteria are known to cause a variety of health problems like staph infections, pneumonia, bronchitis, meningitis, and gastroenteritis, respectively. Additionally, phages are effective against ten of the most antibiotic-resistant strains of *E. coli* (Rahmani, Zarrini, Sheikhzadeh, & Aghamohammadzadeh, 2014). Table 1 shows several comparisons between bacteriophages and antibiotics and offers a condensed view of phage therapy viability. The

Table 1. Comparing and Contrasting Bacteriophages and Antibiotics

	Side Effects	Targeting Ability	Site Specificity	Resistance	Treatment Development
Bacteriophages	No serious known side effects	Infect targeted pathogenic bacteria	Congregate at infection site	Rarely encounter phage-resistant bacteria which are typically susceptible to other phages	Can easily select specific phages to develop new treatments quickly; new phage treatments are easy to develop due to high specificity of phages
Antibiotics	Can cause side effects such as allergies, intestinal disorders, and secondary infections	Target both pathogenic microorganisms and normal microflora, which affects microbial balance in patients	Do not concentrate at the infection site and are eliminated from the body over time	Antibiotic-resistant bacteria are common and develop from non-selected bacteria during antibiotic treatment	New antibiotics are developed slowly

Note. Chart adapted from “Bacteriophage Therapy,” by A. Sulakvelidze, Z. Alavidze, and J. G. Morris, 2001, *Antimicrobial Agents and Chemotherapy*, 45(3), 649–659.

use of phages as antibacterial agents in the past century in other places than the United States has had a lasting impact on the treatment of bacterial infections (Abedon, Kuhl, Blasdel, & Kutter, 2011).

Regulating Applications of Phage Therapy

The policy decisions regarding characterization of phages as medicinal products are controversial due to the varying definitions of bacteriophages and efficacy of phage therapy. In many countries, phage therapy is placed into one or more of three categories: a general medicinal product, a biological medicinal product (such as a vaccine), or an advanced medicinal product (such as gene therapy). In Europe, phage therapy is already implemented and is considered a biological and medicinal product suitable for human use (Verbeken et al., 2014). The European Regulatory Framework dictates that phage therapy should be delivered through a mixture of bacteria-specific phages also known as “phage cocktails.” For non-life-threatening infections, these cocktails are sold over the counter. Phage cocktails that target potentially life-threatening bacterial infections, however, are only administered in a hospital setting (Verbeken et al., 2014).

Phage Cocktail Therapy has yet to be fully supported by the FDA for direct treatment of human disease because each phage must be approved individually (Keen, 2012). An example of the FDA’s hesitation toward this type of therapy is the production of Staphylococcal Phage Lysate (SPL) in 1959. SPL can be used to treat wounds infected with *Staphylococcus aureus* and after safety trials were conducted, SPL was licensed for administration in human

treatment. However, the production of SPL for human treatment was suspended in the 1990s due to regulatory pressure from government agencies. Currently, SPL is approved and utilized only for veterinary applications (Golkar et al., 2014).

In regard to the food industry, in 2006 the FDA approved phage food additives to combat contamination, particularly for anti-*Listeria* treatment (“Food Safety,” 2015). Phages can be used to treat *Listeria* in ready-to-eat meat, and bacterial damage of tomatoes and peppers, and treatments are recognized as compatible with organic food production. Additionally, the FDA has approved phage use in treatment of bacterial pathogens such as *E. coli*, *Salmonella*, and *Campylobacter* (Golkar et al., 2014).

Phage Therapy and *Campylobacter jejuni*.

The use of phages in the food industry includes the treatment of the *Campylobacter jejuni* bacterium. The *Campylobacter jejuni* bacterium is the most common cause of gastroenteritis in humans. Commonly found in the feces and intestinal tracts of poultry, the *C. jejuni* bacterium causes contamination of poultry meat. One method of preventing infection involves dosing live poultry with bacteriophage cocktails to lessen the amounts of *C. jejuni* in their intestinal tracts (Hammerl et al., 2014).

Hammerl et al. (2014), studied the effects of the introduction of the Myoviridae bacteriophage family on the *C. jejuni* bacterium found in broiler chickens. In this study, some chickens were treated with single phages and others with groups of phages (Hammerl et al., 2014). The phages were

categorized into three groups based on genome size and morphology. Phages in group II were able to infect more strains of bacteria than group III, though some of the phages in group III had a higher lytic activity, meaning they were more effective at killing the bacteria of the strains that they were able to infect. After comparing the ability of these phage groups to reduce *C. jejuni* numbers, the researchers found that the chickens treated with a combination of phages from groups II and III had the greatest reduction of *C. jejuni* in their intestinal tracts (Hammerl et al., 2014). The results of this study could positively impact the future of food safety.

Phage Therapy and *Pseudomonas aeruginosa*.

Pseudomonas aeruginosa is an opportunistic, multidrug-resistant bacterium commonly found among the human microbial flora of the skin. However, if this seemingly harmless bacterium is introduced into the bloodstream, it can cause serious complications, including sepsis, an often fatal bacterial infection of the blood (Vieira et al., 2012). Vieira et al. (2012) demonstrated in their study that immediately after phages were applied to infected human skin the amount of resistant bacteria significantly decreased from a control of 10^6 CFU (colony forming units) per square centimeter to 10^2 CFU per square centimeter. This nearly ten billion CFU per square centimeter drop supports the effectiveness of phage therapy. In addition, the experiment exhibited that only one application of phages was necessary as subsequent applications did not lower the bacterial concentration. This proves promising for treating multidrug-resistant bacterial infections using phage therapy (Vieira et al., 2012).

Potential Use of Phages in Treatment of Crohn's Disease

Another use of phage therapy in medical research can be seen through the treatment of Crohn's disease (CD). CD is commonly called regional enteritis, or inflammatory bowel disease, and its cause is unknown. Josef Wagner, researcher at Murdoch Children's Research Institute, has investigated the differences in the bacteriophages present within the gut and small intestine of pediatric patients that have CD (Wagner et al., 2013). The researchers analyzed the genome of the phages to determine if these phages were unique to the intestines. Ultimately, they found that CD patients exhibited a higher amount of unique bacteriophages compared to their control counterparts. Overall, the large abundance of phage composition within CD ileum tissue and CD gut wash samples suggests a role of phages in CD development. Researchers assumed that the increase in the amount of phages indicated that the bacterial count was higher. Therefore, the presence of specific phages may coincide with specific bacterial counterparts (Wagner et al., 2013). Because phages are host-specific, the identification

of disease-causing phages could allow for development of new and effective treatments.

Phage Application in Cleaning Surfaces

Another environment prone to resistant bacteria is hospital equipment. Bacterial colonies growing on the surfaces of hospital equipment often come into contact with antibacterial cleaning supplies. This common interaction allows the bacteria to develop resistance to these cleaners. Research is being conducted to devise a technique to clean hospital surfaces while treating resistant bacteria using bacteriophages (Viertel, Ritter, & Horz, 2014). These cleaners prove less of a hurdle for regulation due to the fact that they would not be used directly on humans.

Susceptibility in Antibiotic-Resistant Bacteria

Another technique to combat antibiotic resistance is to use phages that insert their genome into the host bacterium to transfer susceptibility genes back into the bacterial genome (Viertel et al., 2014). This allows bacteria that were once antibiotic resistant to regain susceptibility to antibiotics.

This occurs because the genes that are transferred into the bacterium increase the permeability of its cell membrane and allow medications to pass through it more freely. Therefore, doctors will be able to use antibiotics that they are familiar with, an approach that is more likely to be accepted by the FDA (Viertel et al., 2014).

The identification of disease-causing phages could allow for development of new and effective treatments.

Endolysins

Endolysins are phage-produced enzymes that rupture a bacterial host cell. These endolysins are specific proteins with known structures that can be defined and therefore regulated. The controversies surrounding use of whole phages or mixtures of phages, including their chemical and biological classification, may ultimately inhibit the approval of phage therapy in the U.S. However, endolysins may provide a solution. As endolysins are static chemicals similar to antibiotics, they may prove more successful in regulation and approval by the FDA.

In addition, endolysins are only required in small doses (Ghannad & Mohammadi, 2012). Researchers at Seoul National University in South Korea studied the use of a phage called PCB1 against *Bacillus cereus*, a bacterium known to cause food poisoning in humans. PCB1 itself was only able to successfully infect 1 out of 22 *B. cereus* strains; however, the purified endolysins produced by the phage were able to successfully lyse all strains of *Bacillus* bacteria (Kong & Ryu, 2015). The lytic activity of the endolysin suggests that these chemicals not only appear to be more favorable due to their static nature, but also may have broader and more successful applications against bacteria than phages themselves

Combination Therapy

The most successful phage therapy is the combined usage of bacteriophages and antibiotics. By using this technique, treatment has shown a promising increase in the reduction of bacterial infection and reducing the amount of bacteria evolving to develop antibiotic resistance. In the future, using both bacteriophages and antibiotics to fight infections may appease drug companies that seek the opportunity to continue producing their own medications, while increasing the effectiveness of phage therapy treatment (Viertel et al., 2014).

Conclusion

Phage therapy presents numerous advantages and options for medical research and scientific application. It is not currently in use in the United States due to a lack of regulatory ability and a large-scale control study, as well as the controversies surrounding the use of phages. New routes of regulation and classification will have to be established for phages to enter mainstream use in the U.S. Phages are being studied with broader host ranges, and being tested on their ability to kill pathogenic bacteria without harming the patients or destroying the body's natural flora. Other areas of phage research include sterilization techniques for hospital equipment, endolysin usage that may surpass phage usage alone, and combination of phage and antibiotic therapies that could potentially result in approval for future use of phages. Phage research has also shown promising results in reintroducing antibiotic susceptibility into antibiotic resistant bacteria, which has become an increasingly prevalent issue in the modern medical world. In addition to combatting antibiotic resistance, phage therapy could eventually be used as a more effective alternative for bacterial infections. For these reasons, phages are a promising medical and industrial tool worldwide in the future.

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● Test Anxiety:

Prevalence, Effects, and Interventions for Elementary School Students



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Academic pressure has the capacity to cause stress for students of all ages. From grade school through the collegiate level, students are likely to experience, to some extent, pressure associated with the demands of schooling. Based on the articles used in this review, a common and debilitating stressor for students is test taking. Therefore, my research aims to identify the definition and prevalence of test anxiety, the physiological and psychological effects associated with this stressor, and the long-term consequences of ignoring it. Additionally, existing research regarding behavioral, cognitive, and skill-based approaches and interventions will be discussed in order to develop a plan to reduce and prevent test anxiety in elementary school children.

Defining Test Anxiety

Over the years, the phrase “test anxiety” has accumulated a variety of definitions. According to early research, it was typically measured using a one-dimensional scale because it had a singular attribute (Cassady & Johnson, 2002, p. 271). However, Sarason (1961) observed that test anxiety could have multiple factors, involving both an increase in adverse physiological activity and deliberation on self-criticizing thoughts; over the years it has become more accepted that test anxiety is composed of two very distinct factors: emotionality and worry. According to Cassady and Johnson (2002), emotionality involves the awareness of the physiological symptoms associated with test anxiety, whereas the worrying, or “cognitive test anxiety” (pp. 271–272), involves the cognitive reactions before, during, and after tests.

Paul, Elam, and Verhulst (2007) explained test anxiety as a “type of distress” that involves both a “physiological” and “psychological” component (p. 287). Used to illustrate the components of test anxiety, their words “physiological” and “psychological” are essentially more concrete terms for “emotionality” and “worry” described by Cassady and Johnson (2002, p. 271). Once an individual is aware of the physiological symptoms, the psychological results can further impair performance, reflecting the interdependent nature of the two dimensions (Paul et al., 2007). In addition to these two components, other factors may influence the level of manifestation of test anxiety. Embse, Barterian, and Segool (2013) noted that biopsychosocial factors may contribute to the extent and expression of distress (p. 57). The severity of test anxiety might also affect social factors and interactions. Although the definition has appeared to evolve over the years, most recent research has supported the idea that test anxiety is a result of the interaction of physiological and psychological components.

Literature Review

Prevalence and Causes

Studies have shown that test anxiety is widespread in the general population, especially among women. An estimated 2–3 students in any given classroom are highly anxious and ten million elementary school students are not performing at their highest capacity due to test anxiety (Ergene, 2003, p. 314). Another study estimates that between 10% and 40% of all students experience some level of test anxiety that can surface as early as age seven, and women, minorities, and those with disabilities are more likely to face it (Embse et al., 2013, p. 58). Moreover, past research has supported the idea that women are prone to experiencing higher levels of test anxiety. For example, one study used the Test Anxiety Inventory (TAI), a scale with subscales that assesses

worry and emotionality, to study gender differences in test anxiety (Everson, Millsap, & Rodriguez, 1991, p. 244). This study found that women scored higher in both worry and emotionality, indicating a higher level of test anxiety overall (p. 247). Cassady and Johnson (2002) also noted the tendency for women to have higher levels of emotionality, which may contribute to their higher levels of test anxiety (p. 283).

While a mild level of stress can be used to motivate and help students prepare for a test, higher levels of stress can be debilitating. Tennant (2005) expressed that stress by itself is neither positive nor negative, and an individual’s reaction to stress depends on how the situation is perceived (para. 11). Tennant explained that stress can be positive if individuals feel they can manage and control the situation. However, if a stressor is perceived as an uncontrollable threat, the result is likely to be more negative. Using Tennant’s example of failing a test as a type of stressor, students who use the experienced stressor as motivation will likely perform better than students who fear that the stress, and therefore the grade, is out of their control (para. 4). Tennant’s article reiterated that stress, although always powerful, is not always detrimental (para. 13). Stress certainly has short-term benefits, but long-term, consistent stress can cause mental and physical health issues.

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In combining and reviewing previous research, root causes of test anxiety have appeared to fall into two areas, the first relating more to the increasing academic demands that various groups and individuals place on students. As the pressure on students to meet or exceed test expectations increases, test anxiety becomes more of an issue. These demands reflect the fact that schools receive evaluations based on their test results, which immensely increases the pressure on teachers to ensure the academic success of their students (McDonald, 2010, p. 92). Due to concern over meeting goals for standardized testing, less time is spent focusing on reducing the anxiety that students experience as a result of these tests.

Not surprisingly, much research and debate has been conducted regarding standardized testing. According to Herman and Golan (1993), standardized testing takes up a large portion of instruction time and “may trivialize the learning and instructional process” (p. 6). These tests place a great deal of stress on both students and teachers, who fear that they will not succeed academically or professionally if test results are poor. Standardized tests are viewed as “high stakes testing” (Herman & Golan, 1993, p. 9), which refers to testing situations associated with important consequences. Another key stress-inducing component of standardized tests is the time constraint. Research has found that

anxiety-prone children are likely to perform poorly under “highly evaluative and demanding testing conditions” such as timed tests (Hill & Wigfield, 1984, p. 114). Although not all anxiety-causing tests are standardized, psychologists can focus much of their research on test anxiety around standardized tests as they are a major focus of attention in schools.

Type of test aside, test scores can create a competitive environment in the classroom, relating to the second area of possible causes for test anxiety: personality traits and underlying psychological issues. Those who have had experience working in classroom settings have likely noticed that children have a tendency to compare themselves to their peers and that they will often know if they are not excelling at the same rate as other students. This understanding may place them at risk for not progressing to the next grade as they may feel more stress associated with exams. According to McDonald (2010), test anxiety is grouped under a category of anxious states and negative emotions that are often associated with neuroticism (p. 90). Additionally, since test anxiety often develops out of fear of negative evaluation, it is similar to a social phobia, which causes fears of being negatively judged. These students may spend more of their time worrying about the outcome of the test and how others will judge their performance than on the test itself.

Psychological vs. Physiological Expression

As previously mentioned, the majority of research has noted that test anxiety has physiological and psychological components. These factors can also be described using the two constructs, emotionality and worry, that are consistently found in test anxiety research. In a general sense, the physiological nature of test anxiety is associated with emotionality and the body, while the psychological component is associated with worry (Paul et al., 2007, pp. 287–288). From a physiological perspective, test anxiety can be expressed in various ways. For many, the experience can cause an increase in heart rate and perspiration, dry mouth, and muscle spasms (Harris & Coy, 2010). In addition, anxious individuals may experience nausea, dizziness, and panic before, during, and even after a test. Many people equate this to the “fight or flight” response of the sympathetic nervous system, which is a key factor in the physiological expression of test anxiety. Emotionality then describes the extent to which individuals experiencing test anxiety are aware of their bodies’ physiological reaction to the anxiety (Sarason, 1984, p. 931). In contrast to bodily reactions, which are fairly simple to measure, observe, and assess, the psychological component of test anxiety delves into a vast range of more subjective constructs, cognitions, and thoughts (Sarason, 1984, p. 931). Recurring themes in the psychological aspect of test anxiety include worry, fear,

apprehension, panic, and cognitive impairment. However, these constructs all seem to develop as a result of the tendency to focus on the self rather than the task at hand when in a threatening situation (Paul et al., 2007, p. 288).

Sarason (1984) described the difference between task-oriented and self-preoccupied individuals and how they differ in where they direct their attention. Task-oriented individuals are able to focus their attention on the task in front of them, which is their preferred way to handle a stressful situation (Sarason, 1984, p. 930). On the other hand, self-preoccupied individuals will focus on the consequences of not performing well and engage in negative self-talk and thoughts (Sarason, 1984, p. 930). Sarason explained that this mindset focuses their attention on future implications rather than the current task, which can lead to poor performance (p. 930). “Worry and emotional arousal” (Paul et al., 2007, p. 288) are possible contributors that cause students to focus on themselves rather than the task. This self-absorption seems to be at the core of the psychological reactions associated with test anxiety.

An individual’s perception
of the anxiety or stress
determines whether the result
is positive or detrimental

Referring back to Tennant’s (2005) depiction of stress, an individual’s perception of the anxiety or stress determines whether the result is positive or detrimental (para. 11). Although taking a test is generally considered a stressful situation,

individual differences can dictate the severity of the anxiety.

For anxious test-takers, much of their stress comes from excessive worrying at various points of the test-taking process. Cassady and Johnson (2002) described “worry” as “cognitive test anxiety” (pp. 271–272), which encompasses the breadth of reactions and thoughts prior to, during, and after tests. They noted that some thoughts associated with test-taking anxiety include comparing performance to other peers, ruminating over the consequences of failure, worrying about negative evaluation, and feeling unprepared. Additionally, some individuals experience a loss of self-worth, low levels of confidence, and fear of disappointing their parents (Cassady & Johnson, 2002, p. 272). Students who experience test anxiety may also place excessive emphasis on the negative consequences of a single test and therefore feel helpless (Harris & Coy, 2010). Fearing poor performance and negative evaluation are likely to contribute to a loss of self-worth, which, according to Cassady and Johnson, is consistently associated with a decline in performance (p. 272).

The physiological and psychological components of test anxiety are separate concepts that work together. The detrimental effects on the body may increase negative reactions in the mind and vice versa. One example of the integration of the two components comes from the idea

that an increase in corticosteroid levels associated with anxiety can actually impair memory, make it more difficult to concentrate, and hinder learning (Paul et al., 2007, p. 287). This can lead to comprehension issues which will ultimately result in poor performance. In fact, “freezing up” on a test may not be suddenly forgetting an answer when presented with a question. Rather, it may be not having sufficiently processed the information required to respond (Cassady & Johnson, 2002, p. 273), relating back to the idea that being anxious while studying for a test may interfere with complete comprehension of material.

Long-term Effects

While the short-term effects of test anxiety are detrimental in many ways while taking a test, they are also likely to lead to a wide range of negative outcomes. According to one study, “anxiety is one of the most common psychological disorders experienced by school-aged children” (Neil & Christensen, 2009, p. 209). Anxiety, in general, is likely to leave significant effects on children in areas of emotional, social, and academic functioning. Neil and Christensen (2009) note the importance of schools in helping to build resilience and/or reduce the symptoms of anxiety (p. 209), as the long-term effects of anxiety can severely and negatively impact a child’s future.

One intervention-focused study described how the feelings associated with the fight or flight response can eventually lead to outbursts, complete withdrawal, fatigue, and avoidance of school all together (Cheek et al., 2002, para. 2). In addition, according to Cheek et al. (2002), students with persistent test anxiety can develop an “invisible disability” (para. 2) of achievement stress that can continue throughout their entire academic career. In this article, test anxiety was also considered a stable personality trait that can cause debilitating behavioral responses when threatened (Cheek et al., 2002, para. 2). Cassady and Johnson (2002) stated that increased levels of test anxiety had a negative correlation with “(a) IQ; (b) aptitude; . . . (d) problem solving; (e) memory; and (f) grades” (p. 273). Following this logic, one can argue that there is a negative correlation between test anxiety and academic success and performance.

In terms of future academic success, it is no surprise that a lack of engagement in school, poor grades, and increased withdrawal and isolation can be detrimental to a child’s future academic opportunities and career. According to a study evaluating test anxiety in college freshmen, lower GPAs and poor study skills were associated with test anxiety (Culler & Holahan, 1980, p. 16, p. 18). This has shown that if test anxiety is not addressed at a fairly young age, it can persist and potentially lead to similar issues in college. Neil

and Christensen (2009) noted that “the effects of anxiety disorders on the well-being of children and adolescents are substantial . . . and can lead to reduced career choices . . . in adulthood” (p. 209). Students who struggle with taking exams and doing well will have a more difficult time continuing their education in a college setting and therefore will be limited in job opportunities and career options.

Furthermore, test anxiety has been found to be associated not only with test performance but with the ability to earn a degree and select an occupation (Ergene, 2003, p. 313). Because individuals who experience high levels of test anxiety fear negative evaluation, they may select a career in which they are infrequently evaluated (Ergene, 2003, p. 313). Individuals who choose careers where they are rarely assessed may experience an unchallenging work environment, which may negatively affect their quality of life because they are not reaching their full potential.

The Basics of Intervention Programs

Given the debilitating short- and long-term effects of test anxiety on school-aged children, school counselors, teachers, and other faculty within the school system should work together to address the problem. Research on intervention programs has focused on the various strategies, structures, and approaches to deal with test anxiety. This section will emphasize the benefits of establishing programs in a school setting and utilizing school faculty to implement these programs. In addition, it will discuss the foundation of behavioral, cognitive, and skill-based approaches as well as explore various coping methods aimed to reduce test anxiety.

Setting and Leadership

Neil and Christensen (2009) discussed intervention programs for generalized anxiety, which encompass and can be applied to a range of stressors, including test anxiety. They emphasized the importance of school systems as effective places for intervention programs because schools have the opportunity to help children who may not otherwise be identified as needing attention (Neil & Christensen, 2009, p. 209). A school setting provides an environment to facilitate skills and establish a place to learn and grow. Other benefits include location, time, and transportation, as the targeted students are in the intervention environment on a daily basis. In addition, a school-based program can provide the opportunity for students to work together in groups (p. 209). A school community allows for stable social support, which may help decrease anxiety and possible subsequent feelings of isolation (Mealey & Host, 1992, p. 148).

In their study, Neil and Christensen (2009) also described how a program leader’s qualities and characteristics can

Anxiety, in general,
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influence the effectiveness of an intervention (p. 212). Specifically, they noted the importance of “program fidelity, leader rapport, relevant content, and audience appeals” (Neil & Christensen, 2009, p. 212). Their research showed that a creative, knowledgeable, and enthusiastic leader is likely to implement a more successful intervention than a leader who is uninterested and unprepared (p. 212). This is important for school teachers to know, as school-based interventions will often utilize teachers as intervention leaders rather than incurring the costs of hiring mental health professionals. Interestingly, according to the study, the trials in which teachers conducted the intervention were more successful in reducing anxious symptoms than trials in which professionals conducted the intervention (p. 213). To increase the success of the program, a basic level of training and understanding of test anxiety and intervention programs would be helpful.

Approaches: Behavioral, Cognitive, and Skill-based

For maximum effectiveness, the type of approach used in a given intervention program should identify the area of test anxiety that is being targeted. A meta-analysis conducted in 2003 analyzed results of past programs in order to determine whether a behavioral, cognitive, or skill-deficit approach is most successful in reducing anxiety (Ergene, 2003, pp. 315–316). Behavioral methods typically focus on the physiological effects of test anxiety and include techniques such as “systematic desensitization, relaxation training, biofeedback, modeling, anxiety induction, anxiety management,” and more (Ergene, 2003, p. 314). On the other hand, cognitive approaches strive to reduce the psychological detriments of anxiety and may utilize “rational emotive therapy, cognitive restructuring...stress-inoculation training,” and other methods (Ergene, 2003, p. 314). Lastly, skill-based programs aim to teach and encourage good study habits and test-taking skills, which focus more on training students to be prepared for the test and how to approach different types of tests and test questions.

A good first step before introducing other behavioral, cognitive, or skill-based methods is relaxation training, a common behavioral approach. The foundation of relaxation training is learning how to take deep and controlled breaths in order to counteract the physiological symptoms associated with anxiety. One study assessed the benefit of Deep Breathing Meditation (DBM) for medical students and noted that without deep breathing, “heartbeat, respiration, blood pressure, muscle tension, and gastric discomfort” can increase (Paul et al., 2007, p. 288). In order to reduce these anxiety-inflicted symptoms, the researchers provided the students with an opportunity to participate in a meditation activity with deep or diaphragmatic breathing

as a key component. At the end of the longitudinal study, students reported less anxious feelings and nervousness as well as a decrease in self-doubt and concentration loss. They also felt that continued use of the exercise would help them in their current and future career.

The DBM exercise used by Paul et al. (2007) was structured using the four components of Benson’s Relaxation Response. According to their description of Benson’s work, the key factors required for a relaxed state include “working in a quiet environment, using a mental device such as concentrated breathing to direct one’s attention, being in a comfortable position where most of the body weight is supported, and having a receptive attitude” (p. 289). One significant benefit of this technique is its simplicity. It does not require extensive equipment or professionals and can therefore be used anywhere at any place and time. For this particular study, the researchers followed a script that took seven minutes to complete (see Appendix A), but shorter variations are likely to be as effective in producing the calming effect associated with DBM.

Behavior and cognitive methods together were effective in decreasing anxiety

While Paul et al. (2007) focused only on the behavioral approach to test anxiety reduction, other research suggested that combining behavioral, cognitive, and skill-based methods is the most beneficial (Ergene, 2002).

According to a study assessing strategies for coping with test anxiety, coping methods can be grouped into five areas: relaxation, positive thinking, preparation, resignation, and concentration (Kondo, 1996, p. 210), all of which track one or more of the approaches. Relaxation has a behavioral focus and aims to ease any bodily tension experienced as a result of emotional arousal (p. 210). Positive thinking is a cognitive approach that involves attempting to eliminate or change the negative thought processes that occur with test taking (p. 210). Kondo (1996) described resignation as a reluctance to decrease anxiety, which some individuals use to avoid facing the problem all together (p. 209). Lastly, preparation and concentration are “task-relevant” and skill-based, focusing on the aspects of test anxiety that lead to successful performance (p. 211).

In his meta-analysis reviewing test anxiety interventions, Ergene (2002) also found that combined approaches were the most effective in reducing anxiety (p. 322). More specifically, he found that behavior and cognitive methods together were effective in decreasing anxiety, but that skill-based techniques alone did not yield the same success (p. 322). He noted that a combined program should incorporate information about studying and test taking, but also present an opportunity to practice attending to the task at hand, learning how to relax under threatening conditions, and self-monitor certain behaviors.

Cheek et al. (2002) combined behavioral, cognitive, and skill-based techniques in a study to establish an intervention specifically for elementary school students. The article noted that interventions involving music, art, and movement were viewed as being more exciting and fun for students (para. 4). The researchers kept this evidence in mind by incorporating these activities into their intervention plan. Additionally, they designed their program in a way that would not keep students from their classes for long periods of time (para. 8). Participating students were made up of a group of individuals who self-reported feelings of anxiety, who did not perform well on a recent benchmark, and who were recommended by teachers.

During the first session, Cheek et al. (2002) provided students with a test anxiety hierarchy consisting of 13 items describing different situations that may occur throughout the testing process (see Appendix B). They asked students to rate each situation on a scale of 0 to 10, 10 being the highest level of anxiety, and used situations associated with the highest level of anxiety as reported by the students as focal points for the remainder of the intervention. The second session incorporated movement by teaching students to “stop, drop, and roll” any time they began to feel stressed (para. 10). The movement associated with each word is as follows:

- *Stop.* Put pencil down and place hands on the table, focusing on the cool surface.
- *Drop.* Tilt head forward.
- *Roll.* Roll head around while gently taking three deep breaths.

Students practiced this exercise while listening to classical music. During the third session, they returned to the hierarchy used during the first session by having students say “fire” each time they got to an item that produced high levels of anxiety (Cheek et al., 2002, para. 11). They then incorporated art by asking students to create portraits of themselves as relaxed and successful test-takers (para. 11). The next three sessions were classroom based and focused on test-taking skills. These skills were taught as a guidance unit and gave the students in the group a chance to teach the “stop, drop, and roll” method to their fellow classmates (para. 12). The last part of the intervention was a school-wide assembly held shortly before school-wide standardized testing would take place. It incorporated music and movement and encouraged students to use the “stop, drop, and roll” technique whenever they felt the effects of test anxiety (para. 12).

The results of this study showed reports of decreased stress and worry about future testing situations. In addition, all 16 students in the group felt more relaxed during the standardized test. Benefits of this intervention include

not only its success, but its simplicity in that it is easy to teach, learn, and understand. Furthermore, incorporating art, movement, and music into the intervention allows for increased interest and engagement and creates a more inviting and interactive environment.

Intervention Plan

Need and Purpose

During my senior year at James Madison University, I completed my senior capstone at a public elementary school in Harrisonburg, VA, which I will refer to as “School A” for confidentiality purposes, as a counseling field placement student. Throughout my time at School A, I was given many opportunities to learn about the responsibilities of a school counselor, which also allowed me to understand the needs of students in this age group and in this area of the country. For the most part, I learned about their needs by mentoring, teaching guidance lessons, observing counseling sessions, and leading groups. In my experience observing and leading a stress management group, I noticed that a common and reoccurring stressor for these students was taking tests. Given the prevalence of this issue at School A, I was motivated to create an intervention plan focusing specifically on test anxiety to be implemented at School A.

Lack of structure and support at home was increasing or potentially causing academics-related anxiety

While mentoring, observing and leading groups, and interacting with the students at School A on a weekly basis, I realized that many of the students had unstable home environments and complicated family dynamics. For some, I felt that the lack of structure and support at home was increasing or potentially causing academics-related anxiety. Therefore, these students needed an opportunity to learn how to self-cope with stress and anxiety at an early age. Moreover, I believed that these students would benefit from the support and encouragement of a group that may have been lacking outside of school.

Group Member and Leadership Selection

The specific intervention plan below is targeted towards elementary students, grades one through five, who either self-refer themselves by means of a group sign up or are referred by their guardian or teacher. In either case, a permission form must be sent home to the student’s parent or guardian to ensure that the child has permission to be involved in the group. In addition, each student should be individually interviewed before the start of the group to confirm his or her desire and willingness to participate.

The leader of the group should be the school’s counselor or a field placement student under the supervision of a school counselor. With basic training and lesson plans, group leaders could easily be expanded to teachers or other faculty.

Only one to two leaders are necessary for each session, and the selected leaders should remain the same throughout the entire intervention. The same leader should be present at every session in order to foster trust with the students. The more comfortable the group members are with their intervention leader, the more likely they are to share their concerns, questions, and thoughts regarding their stress. As a result, leaders will be more likely to uncover and focus on specific areas of need for that particular group. Overall, the intervention will be more successful with greater consistency and a safer environment.

Both the needs of the teachers and the students should be addressed. When students need additional attention, teachers are usually concerned with taking away time from a structured class to provide extra help. Teaching time should be valued and respected so that the intervention plan does not cause students to miss material. Therefore, this intervention plan is designed to be held during lunch time. The program is designed to be approximately eight weeks in duration and consist of weekly 30-minute meetings during students' normally scheduled lunch. Due to the already established appeal and success of lunch groups at School A, students would most likely be interested in participating. The sessions will incorporate some elements of the established stress management group, activities and methods from the test anxiety interventions previously discussed, and additional introductory or closing exercises.

Session Descriptions

Session 1. The first session of the group will focus on creating a group name and establishing guidelines to help each meeting run smoothly. Leaders should emphasize the importance of confidentiality so that students feel comfortable sharing their stories and experiences. Toward the beginning of the session, the students will be asked to say their names and something different or unique about themselves. This will establish the welcoming, encouraging, and positive environment that the group leader and members should strive to maintain.

Sessions 2 & 3. The second and third sessions will be dedicated to discussing how test anxiety affects our body and our mind. Therefore, leaders will discuss both the physiological and psychological reactions associated with the test taking process and create a graphic to distinguish the difference. Each group member will be given an opportunity to describe how test anxiety affects them. This will promote conversation during the session and show students that they may have similar and/or different reactions to other students. At the end of the third session, students will be asked to share something about themselves that they are proud of or good at.

Session 4. The goal of the fourth session is to target where the highest level of stress associated with test taking originates. In order to do this, leaders will guide students through the anxiety hierarchy described by Cheek et al. (2002, para. 9). By allowing students to rate each item based on the level of anxiety created, a focal point for the remainder of the sessions will be established. Although behavioral, cognitive, and skill-based techniques will all be addressed in future sessions, the amount of time spent on each area will be determined by the combined results of the hierarchy exercise.

Session 5. During the fifth session, leaders will discuss and teach coping methods for the physiological side effects of test anxiety. The deep breathing meditation exercise described by Paul et al. (2007) will be completed at the beginning and the end of the session while listening to relaxing classical music. This exercise will use a modified version of the script in order to make use of limited amount of time. Additionally, physical exercise, listening to music, and reading will be encouraged as ways to cope with anxiety before and/or after a test.

In order to address anxiety that emerges a few minutes before or during a test, students will be taught the "stop, drop, and roll" method described by Cheek et al. (2002).

Intervention will be more successful with greater consistency and a safer environment

Session 6. At the start of the sixth session, students will be asked to stand up and participate in an exercise that is designed to calm nerves. They will start by shaking their right hand 10 times while counting down from 10, followed by their left hand, right foot, and left foot. They will then repeat this in the same order, but count down from nine, and then eight, and so on, until they reach one shake for each hand and foot. This exercise will be followed by one minute of deep breathing, which together will establish the relaxed state addressed in the previous session. The goal of the remainder of the session will be to focus on the psychological and cognitive components of test anxiety. Specifically, leaders will address the negative thought process that often occurs before, during, and after tests and discuss ways to counteract these thoughts with positivity. Leaders should address the benefit of positive self-talk and encourage students to engage in this technique during any point of the testing process. To facilitate this lesson, leaders will also create a graphic organizer with two columns. On one side, students will share the negative "what if" thoughts that crowd their mind when dealing with tests. On the other side, the "what if" will be turned into a positive and encouraging phrase.

Example:

Negative thought:

“What if I fail the test because I can’t remember the answer to one of the questions?”

Positive response:

“Even if I don’t know the answer to one question, I will know the others because I am prepared for this test.”

Session 7. The seventh session will focus on studying and test-taking skills. Leaders will describe different study tools (flashcards, outlining, etc.), as well as encourage students to start studying and preparing as soon as possible rather than waiting until the night before. Additionally, students will learn about test-taking strategies (process of elimination, using context clues, etc.), and how to manage their time wisely during a test.

Session 8. The last session will be a celebration where students will have the opportunity to eat treats brought in by the leaders and make “stress balls” using small balloons and sand. This session will also be used to review the techniques learned throughout the intervention and to encourage students to share them with their friends and family.

Post-intervention Follow-up and Expected Outcomes

If successful, students who complete the program in its entirety should expect to feel more relaxed, have improved study and test-taking skills, and be able to approach future tests with confidence. In addition, the goal is for students to share the techniques and information they learned in the group with other students. A few months following the conclusion of the intervention, leaders should reach out to students in the group to see if the techniques they learned have helped them be more successful.

As an additional follow-up, the leaders of the group should prepare a brief presentation for faculty regarding the background, purpose, and outcome of the intervention. This will not only allow teachers to stay informed on what their students are working on outside of class but will also encourage them to try the activities in their own classrooms. Although the entire intervention might be too lengthy to complete during class time, teachers could easily allow time for some of the quick pre-test exercises outlined in the session descriptions.

Overall, I expect this intervention to provide students with information and coping methods that are memorable and easy to do at any time. Additionally, I expect teachers to become more educated on the prevalence and causes of test anxiety, in hopes they are encouraged to play their part to reduce the effects.

Conclusion

Test anxiety is a multifaceted stressor with physiological and psychological components that can severely interfere with a child’s mental health and academic success. As academic pressure increases in our culture over time, implementing test anxiety interventions at an early age is becoming even more crucial. Interventions need to focus on targeting both the physiological and psychological effects of test anxiety by incorporating behavioral, cognitive, and skill-based methods into their programs. Providing students with the opportunity to understand and learn how to reduce test anxiety at a young age can immensely impact their current and future academic success.

The intervention plan discussed above is simple to adopt and implement and has the capacity to vastly improve how students approach test taking. While this may begin at the school where I worked, there are ways in which this plan can be shared, taught, and adopted throughout various school systems. As a first step, school counselors can begin to promote this intervention plan at local county and state school counselor meetings. Additionally, the American School Counselor Association holds an annual conference where this information could be shared on a national level. Regardless of how and where this topic is shared, the effects and prevention methods of

test anxiety are an important topic that should be discussed across school systems. If the right level of support and attention is focused on this increasing problem, test anxiety may eventually become a mandatory topic in school counseling curriculums.

Not only is the structure of this intervention plan easy to implement, but it is also adaptable to different age groups. Although most activities and instructions used in this plan are not age-specific, leaders can certainly adjust their plan to fit the needs and demographics of the students in their group. They can do so by adjusting worksheets and discussion questions at their discretion, so long as the key concepts and foundations of the intervention plan are unchanged. The ease, adaptability, and importance of this intervention plan will hopefully contribute to confronting and tackling test anxiety once and for all.

Implementing test anxiety interventions at an early age is becoming even more crucial

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Appendices

Appendix A: Deep Breathing Meditation (Developed based on Benson's Relaxation Response found in Paul et al. 2007)

- Sit up straight with your feet flat on the floor, hands comfortably in your lap or on the desk and allow your chair to support you.
- Let your eyes drift slowly closed, top lid touching the bottom lid, looking at the insides of your eyelids.
- Let your body be still except for your breathing.
- Going at your own pace, notice your inhale and exhale (allow time for two or more cycles after giving directive).
- With your next inhalation, pull your in-breath deep into your abdominal area, like filling up a balloon with air.
- Then exhale out, out, out, until you can't exhale anymore (allow time for two or more cycles).
- Inhale again, deep into your abdomen, not holding on with your belly muscles—there's no need to hold on with your body on the exhalation. Let your navel push back towards your spine on the exhale out, out, out.
- Deeply, not forcing your breath, but not skimping on it either, continue at your own pace (allow time for two or more cycles).
- Notice how on the inhale, the air is slightly cool past the tip of your nose and how on the exhale, the air is now slightly warm past the tip of your nose (two or more cycles).
- Notice how on the in-breath, your rib cage pulls apart, then collapses on the exhale (allow time for two or more cycles).
- With your next inhalation/exhalation cycles, try counting your breath. For example, if you inhale for three seconds, then exhale for three seconds.
- Your inhalations and exhalations might be shorter or longer, it doesn't matter. Take the time now to try to match them (at least five complete cycles).
- Bringing yourself back to the room, open your eyes, and take this calm feeling with you for the day.

Appendix B: Test Anxiety Exposure Hierarchy (By Kennedy and Doepke 1999, referenced in Cheek et al. 2002)

- You are preparing for the test that will be administered in one week.
- You are in class working on skills for the test. It is a week before the test.
- You are discussing the importance of the test. It is now Friday morning.
- It is Monday morning before the test. You are studying and planning your schedule for tomorrow.
- It is the night before the test. You are thinking about the test you will take in the morning.
- It is the day of the test. You are eating breakfast. How are you feeling?
- It is Tuesday morning, and you are walking into your classroom.
- You are sitting in a classroom, waiting for the test to begin, and they hand you your test.
- You start the test and read the first question. You do not know the answer immediately.
- You are taking the test and read a few more questions that are confusing.
- You realize that people are finishing the test, and you know that you need more time.
- You are taking the test, and it is time for lunch.
- You turn in the test.



DO-IT-YOURSELF GIRL POWER.

An Examination of the Riot Grrrl Subculture

Lindsay Wright

The Riot Grrrl subculture emerged from the punk rock scene during the third-wave feminist movement in the early 1990s, uniting women and girls against capitalist and patriarchal cultural ideologies. Creative forms of protest including music, fanzines, and other do-it-yourself expressions have allowed Riot Grrrls to counter the dominant ideological narrative in the United States. Despite the Riot Grrrl movement's commodification by mainstream culture, it has evolved and expanded to continue to influence the world today.

Introduction

In the early 1990s, the initial Riot Grrrl movement formed out of the collaboration of women from Washington D.C. and Olympia, Washington, who were tired of having their female perspectives stifled by the punk rock scene. Not content with being silenced by the men in the punk subculture, Riot Grrrls emerged in the context of third-wave feminism, which united women and girls around the country. Separate from the male punk subculture, Riot Grrrls rebelled not only against the dominant ideological frameworks of capitalism and consumer culture, but also against the patriarchy that dominated American society (Huber, 2010). Rather than follow the “trend within contemporary society for women to become invisible and become forgotten when the past becomes ‘history’” (Strong, 2011, p. 400), these women began a new punk movement fueled by the power of like-minded girls and their collective creativity. These key creative subcultural elements of music and do-it-yourself (DIY) ethic were instrumental in the formation and proliferation of Riot Grrrl identity in the 1990s. Despite its subsequent commodification by mainstream consumer culture, the Riot Grrrl movement has evolved and maintains a global influence today.

Riot Grrrl Identity

As a subculture, the Riot Grrrl movement was blatantly political in its message and resistant to the heteronormative and patriarchal standards maintained by the dominant culture (Huber, 2010). In an effort to give nonconforming women a voice in society, Riot Grrrls vocally opposed power structures that perpetuated limiting ideals of heterosexuality and traditional gender roles. Kathleen Hanna, the front woman of the Riot Grrrl band Bikini Kill, explicitly defined the mindsets and characteristics of a Riot Grrrl in her “Riot Grrrl Manifesto,” published in 1991 in *Bikini Kill Zine 2*, one of the short, homemade publications used to promote Riot Grrrl ideology. Hanna pitted Riot Grrrls against dominant American culture: “BECAUSE we hate capitalism in all its forms and see our main goal as sharing information and staying alive, instead of making profits of being cool according to traditional standards.” Hanna further described Riot Grrrls as “seek[ing] to create revolution in [their] own lives every single day by envisioning and creating alternatives to the bullshit christian capitalist way of doing things.” Through their actions and group identity, Riot Grrrls worked against “racism, able-bodieism, ageism, speciesism, classism, thinism, sexism, anti-semitism and heterosexism” (Hanna, 1991).

As Hanna (1991) explained in her manifesto, Riot Grrrls formed in opposition to the pervasive consumer capitalist culture in the United States. Whereas capitalism is the economic system under which the U.S. operates, Western

culture is overwhelmingly rooted in consumer capitalism meaning that not only are resources privatized, but concepts, ideals, and bodies also gain exchange value within a cultural context (Riordan, 2001). More specifically, Girls’ Studies researcher Sharon Mazzarella (2015) noted that Riot Grrrls opposed consumer capitalism because of how it can commodify women (personal communication). Commodification is the conversion of specific markers such as dress and music into mass-produced products (Riordan, 2011), and within the capitalistic system, women are repeatedly sexualized, objectified, and held to unrealistic, unattainable standards that commodify their existence. Furthermore, capitalism threatens to rob women of their individual authentic experiences by forcing them to operate in accordance with a culture driven by consumerism (Huber, 2010). Angered by this oppression, the Riot Grrrl narrative served to deconstruct consumer capitalism and its detrimental effects on women.

Within the capitalistic system, women are repeatedly sexualized, objectified, and held to unrealistic standards that commodify their existence.

As a subset of the third-wave of feminism, Riot Grrrls sought to create solidarity and raise a voice against oppressive societal institutions. Out of opposition to the traditional connotations associated with the word “girl,” Riot Grrrls reclaimed “girl” to give their subculture a unique identity (Dunn, 2014). Hanna

justified this choice in her manifesto: “BECAUSE we are angry at a society that tells us Girl = Dumb, Girl = Bad, Girl = Weak.” Adding a growl-like spin to the spelling, the Riot Grrrl subculture of the 90s contrasted standards of femininity and social cooperation and redefined the traditional idea of what it means to be a girl. As Schilt (2003) explains, “The use of the word ‘girl’ came from a desire to focus on childhood, a time when girls have the strongest self-esteem and belief in themselves. The rewriting of the word as ‘grrrl’ represented the anger behind the movement; it sounded like a growl” (p. 6). Throughout the movement, Riot Grrrls have been intentional in their identification and representation of members as fiercely empowered women prepared to riot against injustices in society.

Riot Grrrls’ Protest

One of the major ways in which Riot Grrrls expressed their ideas during their peak was through music. Music frequently has the power to unite subculturists, although subcultures consist of much more than a group of people with a shared taste in music (S. Mazzarella, personal communication, 2015). Subculturists, like Riot Grrrls, are members of subcultures who are united by their shared opinions and actions to oppose dominant cultural ideologies and discourses (S. Mazzarella, personal communication, 2015). For Riot Grrrl musicians, song lyrics were an extremely powerful tool to express their

standpoints on important issues. Songs by Riot Grrrl-affiliated bands such as Bikini Kill often included topics of “rape, domestic violence, incest, abortion, eating disorders, body image, and sexuality” (Riordan, 2001, p. 287), which have been construed differently by the mainstream media. Listening to Riot Grrrl music allowed women and girls to identify their experiences and struggles within the confines of society and politics (Schilt, 2003). Furthermore, the blunt, relevant lyrics presented in their music invited girls to engage their feminist agency (Riordan, 2001). Riot Grrrl-affiliated music has continually held the power to advance the movement by encouraging listeners to take an active role in their mission, perhaps by expressing themselves creatively.

To illustrate the music’s influence, Huber (2010) identified evident countercultural themes in his analysis of lyrics from Bikini Kill’s song “Rebel Girl” and Sleater-Kinney’s song “Modern Girl.” In “Rebel Girl,” Bikini Kill encourages listeners to catalyze a gender revolution. While performing the song, they incorporated high energy “vocal styling and [a] militant drumbeat” (p. 74), which supplemented their message. The performance created an image of a “strong and powerful” woman, reflecting the idea of the Riot Grrrl as an empowered and independent individual who is capable of starting a revolution. Similarly, the lyrics of Sleater-Kinney’s “Modern Girl” reinforce the negative effects of capitalism on women’s self image. In the song, the band “invites listeners to view capitalism as creating distance between the modern girl and the reality of the rest of the world” (p. 75). Through “Modern Girl,” Sleater-Kinney emphasizes the Riot Grrrl mentality that counters capitalism, while encouraging women to take control of life in the real world. These songs from Riot Grrrl-associated bands exemplify how lyrical content paralleled Riot Grrrl ideals and called listeners to action.

In addition to the content of Riot Grrrl songs, the actual performances and music festivals during the 90s played an important role in unifying Riot Grrrls as they encouraged audience members to contribute to a dialogue. These events were and continue to be safe spaces for women to share their experiences related to the difficult topics discussed in Riot Grrrl-affiliated music. Similar to standard punk shows, the microphone is often passed to audience members to share their stories alongside the musicians (Huber, 2010). In 2000, the Ladyfest music festival began its tradition in Olympia, Washington as a specific politically charged music and arts festival (Huber, 2010). Organized by women at the grassroots level, features such as live music, performance art, visual art, and spoken word continue to allow women to utilize their agency and speak out about

their experiences in a safe setting (Huber, 2010). Not only have these festivals incorporated music, but they have also emphasized the DIY ethic that was integral to the Riot Grrrl movement at its peak.

The Riot Grrrl DIY expression facilitated the exploration of broaching taboo topics and the vulnerability of sharing common experiences among girls. According to a self-professed Riot Grrrl in an interview with Rosenberg and Garofalo (1998), the movement was about “Riot [G]rrrls getting girls to do it for ourselves” (p. 818). Hanna’s “Riot Grrrl Manifesto” also placed clear value on female-empowered content creation:

BECAUSE us girls crave records and books and fanzines that speak to US that WE feel included in and can understand in our own ways.

BECAUSE we wanna make it easier for girls to see/hear each other’s work so that we can share strategies and criticize-applaud each other.

BECAUSE we must take over the means of production in order to create our own meanings.

BECAUSE viewing our work as being connected to our girlfriends-

politics-real lives is essential if we are gonna figure out how we are doing impacts, reflects, perpetuates, or DISRUPTS the status quo. (Hanna 1991)

Hanna’s do-it-yourself mentality reflects the importance of girls’ individual contributions to Riot Grrrl publications and music that challenged the common consumer capitalist and patriarchal culture.

Subculture members like Hanna predominately contributed to Riot Grrrl literature during its peak in the 1990s was through fanzines, or zines, which are “personal, small-scale paper ventures [that] tell the kinds of stories deliberately ignored, glossed over, or entirely forgotten by mainstream media” (Moore, 2008, para. 3). This uncommercialized platform provided girls a space to express themselves and contribute to the ideals of the Riot Grrrl movement. Girls who had experienced similar hardships produced zines that included a myriad of topics, similar to the taboo themes of Riot Grrrl music. As Schilt (2003) stated, “zine making offered many girls a forum in which to discuss the marginalization they felt in the predominantly male punk scene and to discuss sexism and harassment with other girls and women who shared similar experiences” (p. 6). Zines were identified as a form of communication that built trust among Riot Grrrls and provided an accessible way to distribute ideas (Rosenberg & Garofalo, 1998). Due to the DIY format of Riot Grrrl zines, they were kept free of mainstream media influence and patriarchal perspectives, thus allowing for free distribution of untainted ideas. According to Moore (2008), zines remain important in the 21st century because “messy, nonlinear, and unprofessional

Riot Grrrl music allowed women and girls to identify their experiences and struggles within the confines of society and politics

describe not only the way they are constructed, but also the reasons they are made” (para. 18).

Frustrated by the negative mainstream media coverage, the Riot Grrrl Press was born to publish zines on a larger scale as a response. The September-November 1993 edition of the Riot Grrrl Press Catalogue stated, “We need to make ourselves visible without using mainstream media as a tool . . . we need to take back control and find our voices again” (as cited in Dunn & Farnsworth, 2012, p. 151). While Riot Grrrls felt it was important to share their message with society, they also abhorred inaccurate media representation of Riot Grrrl movement beliefs. In fact, the Riot Grrrl movement ultimately called for a “media backout” in 1993. Media outlets and interviewers were then directed to Riot Grrrl Press for information, which at that point had over 60 zines that addressed a broad range of topics (Dunn & Farnsworth, 2012). However, while the movement needed to distribute their message, the 1993 Riot Grrrl Press Catalogue explicitly warned against commodification of zines: “It would truly bum me out if this turned into a commodification of ‘girl zines’ where if you have the cash you can have access to whatever you want” (as cited in Leonard, 1998, p. 109). In order to authentically distribute these DIY artifacts on a large scale, the Riot Grrrl Press required contributions from girls across the country. Whereas white, middle class women typically had the financial stability, and thus leisure time, to devote to mass-producing zines, many girls who worked for the Riot Grrrl Press came from diverse backgrounds and working class socioeconomic status (Dunn & Farnsworth, 2012). The varied makeup of the Riot Grrrl Press reflects the movement’s commitment to expressing the intersectional voices and perspectives of women from varying backgrounds.

However, the DIY elements of the Riot Grrrl subculture in the 90s were not limited to the zines published independently and/or by the Riot Grrrl Press. In interviews conducted by Rosenberg and Garofalo (1998), a self-identified Riot Grrrl stated that inherently, self-expression is “an act of feminism” (p. 824). She explained, “Creating your own culture is a feminist act . . . It’s an empowering act to create your own culture that has positive messages about you” (p. 824). Riot Grrrls contributed to creating an open feminist culture through various DIY self-expression outlets, including radio shows, public access television programs, spoken word performances, art, and film to communicate their ideals (Dunn & Farnsworth, 2012). The female body even became a tool in DIY culture. At protests, rallies, and shows, “Riot Grrrl bands engaged in actions to reclaim traditionally derogatory words (such as cunt, bitch, dyke, and slut)” (Dunn, 2014, p. 69). Many women

painted their bodies with these words, often in lipstick, using their bodies as canvases to share important messages. Feminist rhetoric often appeared in graffiti on buildings and other public property (Dunn & Farnsworth, 2012, p. 141). The free-form, creative, and self-expressive nature of the various DIY projects provided an avenue for women to reclaim their agency, making them an integral part of the peak Riot Grrrl movement.

Evolution of the Riot Grrrl Movement

Because subcultures inherently function as outside noise that disrupts the structure of a hegemonic culture, commodification has the potential to weaken subcultural messages. Concepts associated with subcultures can become heavily marketed through broad media exposure to the detriment of their intended purpose because, upon receiving extensive publicity, they can often become diluted and part of the dreaded mainstream (S. Mazzarella, personal communication, 2015). When these subcultural objects and ideas are mass produced and appeal to the dominant culture, the movements become commodified and may lose their counter cultural traction. The commodification of the concept of “girl power” in the Riot Grrrl subculture overshadowed the values of the subculture, concealing the true message of the movement. In its entirety, third-wave feminism, of which Riot Grrrl was a subset, was—and continues to be—difficult to commodify given its many nuances. However, the concept of girl power, initially introduced by Riot Grrrls, was easy to market, and quickly became popular in hegemonic society in the mid 90s. As girl power became commodified, the Riot Grrrl rhetoric of empowerment and cultural resistance was diluted and normalized (Riordan, 2001).

Following the explosion of the Riot Grrrl movement, the commodification of “girl power” is best exemplified by the Lilith Fair movement that emerged in the mid to late 1990s. A traveling music festival, Lilith Fair featured popular female musicians such as Sarah McLachlan, Fiona Apple, and Alanis Morissette. While these artists spread the message of female empowerment, they performed in a way that was aligned with traditional, corporate ideals, which Riot Grrrls directly opposed (Huber, 2010). As such, although these female musical artists promoted female agency, they simultaneously remained captive to hegemonic standards for women (Riordan, 2001; Huber, 2010). The pre-packaged form of girl power they spread forced Lilith Fair musicians to stray from the radical, countercultural ideals on which the Riot Grrrl movement was founded. Riordan emphasized the detrimental commodification of girl power by saying, “This adoption of once-marginalized

Riot Grrrls contributed
to creating an open
feminist culture
through various DIY
self-expression outlets

pro-girl rhetoric compromises the more subversive form of feminism, Riot Grrrl” (p. 294), which highlighted the way that the subculture was undermined by the mainstream it rebelled against.

In addition to the capitalization of the concept of girl power, media misrepresentation played a considerable role in weakening the Riot Grrrl movement. Overbearing media coverage “both trivialized and exoticised the Riot Grrrl” (Dunn, 2014, p. 323). According to Dunn and Farnsworth (2012), media coverage “tended to be superficial, at best, and damagingly counterproductive, at worst” (p. 147). A pivotal moment came when a story about Riot Grrrl in *Spin* magazine used a stereotypically thin model to pose as a “Riot Grrrl.” The model was portrayed with derogatory words on her body, similar to how real Riot Grrls adorned themselves with these words to make a statement. However, using a mainstream model to represent all Riot Grrrls contradicted the subcultural ideal of deconstructing the dominant culture’s standards of beauty. Dunn and Farnsworth (2012) explained this as “appropriating [a] political act for a fashion statement” (p. 147), which weakened the overall logos of the Riot Grrrl movement. Given the misrepresentation of Riot Grrrl in the mainstream media as well as overselling the commodified concept of girl power, Riot Grrrl’s momentum appeared to slow in the mid to late 1990s.

Riot Grrrls Today

Although the movement’s most prominent time was the 1990s, Riot Grrrl remains an active subculture. According to Dunn (2014), “Today, there are established Riot Grrrl groups in Malaysia, Brazil, Paraguay, Israel, Australia and across Europe . . . Moreover, there are Riot Grrrl-inspired bands, zinesters and activists around the globe” (p. 325). Riot Grrrls have made significant strides over the years, even as they continue to face inequality and discrimination in relation to the dominant cultures that are pervaded by capitalist and patriarchal ideals. Spread through a combination of human agency and globalization (Dunn, 2014), the Riot Grrrl movement has inspired individuals globally, illustrating the significance of the free flow of ideas and counter-cultural dialogue that Riot Grrrls emphasized in the 1990s and continue to reinforce today.

The Riot Grrrl movement was founded in opposition to capitalism, which has commodified and weakened their message over time. Despite this, the free flow of capitalism—in combination with publicity—has helped spread the movement around the world. Ultimately, “the global networks that spread and connect Riot Grrrls create a global community grounded in the practical expression of punk’s ethos of DIY, resistance, and disalienation” (Dunn, 2014, p. 326). Although the movement may be seen differently now than at its beginning, the core elements of the Riot Grrrl movement are still present. In countries around the

world, Riot Grrrls continue to challenge dominant and common cultures by voicing their opposition through their unique acts of self-expression.

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About the Contributors



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Daniel Vieth ('15) is a first-year graduate student at JMU working towards a Master's degree in Communication and Advocacy Studies. He is a Double Duke, having graduated last May with a Bachelor's of Science in Communication Studies. Daniel is a graduate assistant for both the School of Communication Studies and Digital Communication Consulting, and works as a student writer for Creative Services.

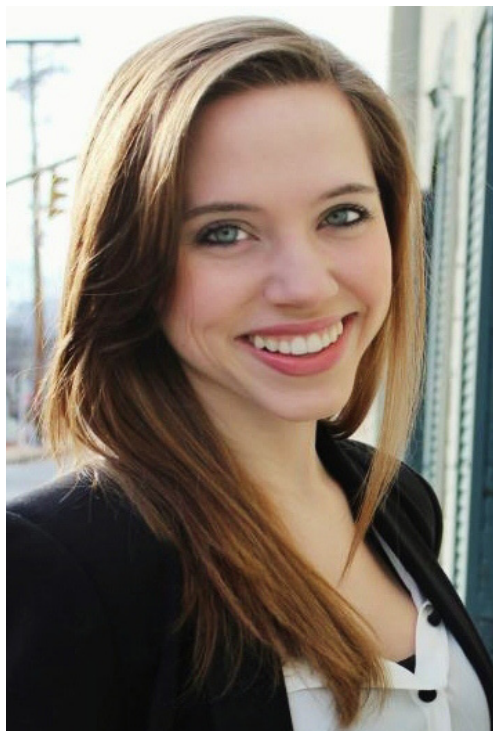
Sawyer Hackett

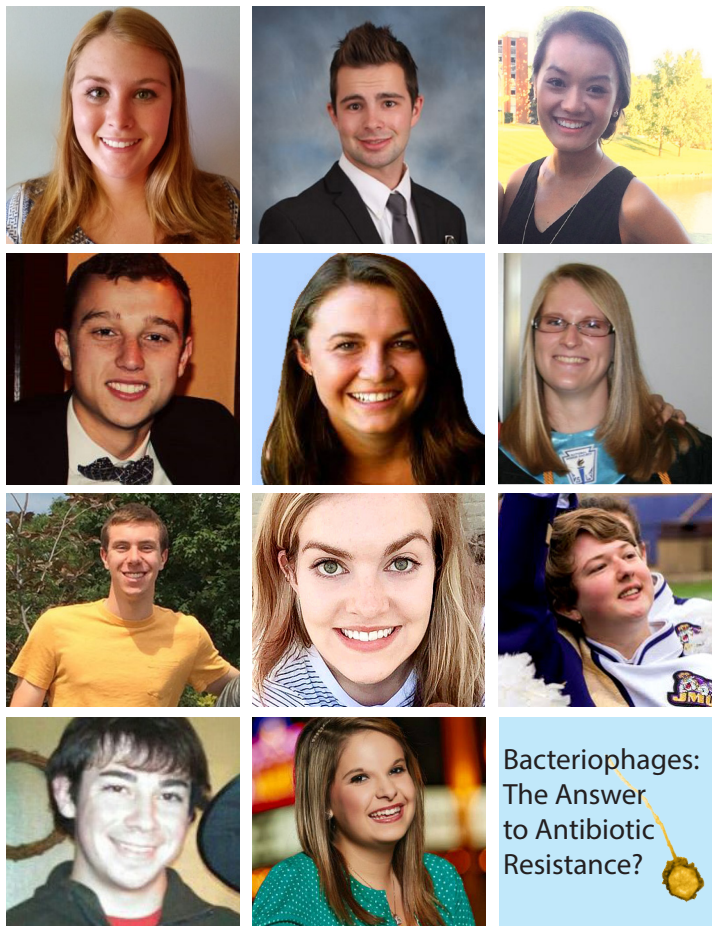
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Lauren Talbot ('14), from Leesburg, VA, graduated with her Bachelor's in Psychology. While at JMU, she was actively involved in the Psychology Department, serving as a Psychology Peer Advisor and member of Psi Chi. She completed her capstone as a Field Placement student at a local elementary school where she became interested in the topic of test anxiety and received the Joann H. Grayson Outstanding Field Placement Award for her work. Since graduating from JMU, Lauren has been working in the recruiting field in Washington D.C., but has plans to attend graduate school in the future in hopes of becoming a school counselor.

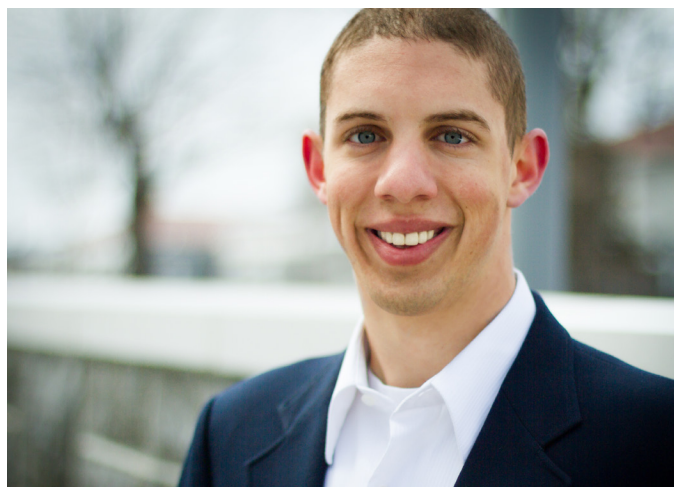




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THANK YOU to all of the students who submitted photos to JMURJ!

