EVALUATING A SELF-DETERMINATION APPROACH TO A TEXT MESSAGE INTERVENTION FOR SEXUAL VIOLENCE PREVENTION

By

JARED SCOTT BRICKMAN

A dissertation submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

WASHINGTON STATE UNIVERSITY
Edward R. Murrow College of Communication

MAY 2017

© Copyright by JARED SCOTT BRICKMAN, 2017
All Rights Reserved
To the Faculty of Washington State University:

The members of the Committee appointed to examine the dissertation of JARED SCOTT BRICKMAN find it satisfactory and recommend that it be accepted.

_______________________________
Jessica Fitts Willoughby, Ph.D., Chair

_______________________________
Porismita Borah, Ph.D.

_______________________________
Yujung Nam, Ph.D.
ACKNOWLEDGEMENTS

Just three years ago, I would consider myself in an academic crisis. At the time, I learned that my then dissertation chair and advisor was leaving Washington State University for a wonderful job. I would be remiss in not thanking Dr. Prabu David for starting me on my journey as a graduate student at Washington State University, but his departure posed a problem. One that helped shape my research tremendously and has afforded me a great deal of opportunity (despite the initial stress).

It was around this time that I began to work with my wonderful advisor and dissertation chair Dr. Jessica Willoughby. To this day, and any forward, I will always tell people that she was my saving grace. My life preserver in a terrible ocean of academic chaos. Her own work has impressed me (enough to cite it multiple times in this manuscript, of course) and made clear the importance of working toward something that really helps people. Ultimately, Jessica’s ability to help and care goes above any beyond anything I expected and will likely experience moving forward. I thank her now and eternally (in fact, she will probably be some day exhausted by how many times I say thank you – well, maybe in a few decades anyway…).

I also have the pleasure of thanking my two other wonderful committee members, Dr. Porismita Borah and Dr. Yujung Nam. They have been wonderful in supporting me, not only on this project, but also in classes and research groups and all the great opportunities they have shared with me. I could not have asked for a more attentive, caring, and positive group of academics to work with. Further, Paula Adams, Taylor, and all the other people who helped from Health and Wellness on this project: thank you.

And finally, to those closest to me, I apologize. Not for doing anything outwardly wrong, but rather, because the rigors and stresses and craziness of academia has likely made me distant
at times or preoccupied at others. All my love goes to my family, friends, and everyone else who has supported me emotionally the past five years working toward this goal of mine. So mom, dad, Kyle, Hana, David, Shuang, Zhaomeng, Christy, and everyone else I’ve met and worked with thank you for bearing with me. One day I hope I can live up to all your expectations of me, and make you as proud of me as I am of all of you.

Oh, and Aslan. Sorry we didn’t go for more walks. But something tells me you were okay with that…
EVALUATING A SELF-DETERMINATION APPROACH TO A TEXT MESSAGE INTERVENTION FOR SEXUAL VIOLENCE PREVENTION

Abstract

by Jared Scott Brickman, Ph.D.
Washington State University
May 2017

Chair: Jessica Fitts Willoughby

Sexual assault is an issue that plagues college campuses and results in physical and psychological harm of students. An option becoming more popular today to tackle sexual assault is the use of bystander intervention education like Washington State University’s Green Dot program. All students go through an in-person training, but health practitioners running the intervention worry the skills and confidence gained may decline throughout the first school year. This study tested a text message-based system for keeping students engaged and knowledgeable about the issues of consent and preventing assault through bystander action. Further, the motivational components of self-determination theory, autonomy, competence, and relatedness, were used to guide the messaging of the intervention and to measure outcomes.

During the in-person Green Dot trainings, 1,242 students signed up to be a part of the text-message system. Some self-selected into a control group with just surveys while the rest were split into two messaging groups: one that received autonomy-related messages, and the other directive-based. Participants completed three surveys over the course of the semester to see how much their attitudes toward bystander intervention and knowledge of consent changed.

Comparing groups at each time point, the results of this study suggest no major differences between groups at pretest. But by the end of the semester, those in the control group
had significantly lower feelings of autonomous choice regulation, competence, and autonomy support than participants in the messaging groups. Although there were no differences for these outcomes between the two messaging strategies, participants in the autonomy group rated their messages as more likeable, said the messaging frequency was less problematic, and they would be more likely to be in a similar intervention in the future. Health practitioners can take the theory-based approach from this study and the methodological insights tied to the platform (e.g. frequency and form) better text-based interventions.

KEYWORDS: Mobile, text, interventions, autonomy, self-determination theory, bystander intervention, sexual assault prevention
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>v</td>
</tr>
<tr>
<td>INTRODUCTION AND STUDY PURPOSE</td>
<td>1</td>
</tr>
<tr>
<td>CHAPTER</td>
<td></td>
</tr>
<tr>
<td>1. ISSUE BACKGROUND AND PLATFORM</td>
<td>5</td>
</tr>
<tr>
<td>RQ1</td>
<td>15</td>
</tr>
<tr>
<td>2. THEORETICAL FOUNDATION</td>
<td>16</td>
</tr>
<tr>
<td>RQ2 and H1</td>
<td>36</td>
</tr>
<tr>
<td>RQ3 and H2</td>
<td>37</td>
</tr>
<tr>
<td>3. MESSAGE DEVELOPMENT AND PRETESTING</td>
<td>39</td>
</tr>
<tr>
<td>4. INTERVENTION METHODOLOGY</td>
<td>46</td>
</tr>
<tr>
<td>5. RESULTS</td>
<td>56</td>
</tr>
<tr>
<td>6. DISCUSSION</td>
<td>61</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>73</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>94</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 1: Intervention Messaging and Schedule ..........................................................94
Table 2: Message Pretesting Measures .......................................................................96
Table 3: Message Pretesting Descriptive Statistics ....................................................97
Table 4: Intervention Measures ................................................................................98
Table 5: System Evaluation Statistics .......................................................................100
LIST OF FIGURES

Figure 1: Scores on Autonomous Choice Regulation .......................................................... 101
Figure 2: Scores on Competence to Intervene ................................................................. 102
Figure 3: Scores on Autonomy Support ........................................................................ 103
Figure 4: Scores on Consent Understanding ................................................................. 104
INTRODUCTION AND STUDY PURPOSE

Attending college is often seen as a rite of passage in American culture, and the allure of leaving home permanently for the first time means that many students face challenges. Some are the mental rigors of classes, others the emotional toll of relationships and separation from family. But administrators and health practitioners at colleges and universities are particularly worried about risk-taking behaviors and the dangers to health that students face. Indeed, because this is the first time many people possess increased amounts of personal autonomy, first-year students are at a higher risk of many health and safety hazards (Bennet, 2014).

Unfortunately, many young people have experienced unwanted sexual contact while enrolled in college (Cantor et al., 2015), and one in five women will be victims of rape (Fisher, Cullen, & Turner, 2000). A report that focused on Washington State University found that 5% of women reported being stalked and 9% reported being in emotionally abusive relationships (American College Health Association, 2015). Sexual assault, stalking, and domestic violence are problems prevalent on college campuses across the United States and abroad. These situations can result in both physical and mental complications (Yeater et al., 2008), which only serve to make the process of education more challenging. Due to normative beliefs and party culture, practitioners may face an uphill battle in combatting the problem (Lindo, Siminski, & Swenson, 2016).

Promisingly, many strategies are emerging to improve campus safety and sexual health. The core of this movement focuses on students having personal agency and wanting to help protect members of their community. One such method is bystander intervention, a student-oriented and prosocial approach that asks students to be proactive within their community and step in when situations of non-consent are happening (McMahon et al., 2015; Exner &
Cummings, 2011), such as a person leading a drunk individual toward a bedroom or someone harassing a person for their phone number. As such, peers are not only creating the change, but also acting as models to help change normative beliefs and actions. The approach has been reasonably successful, with several different organizations sponsoring bystander intervention for issues like sexual assault, but also excessive drinking, drug use, and overeating. Such programs, however, face barriers when trying to keep college students engaged and aware of the content they learned for long periods of time after an intervention. This communication issue stems from students being too busy, to simply not being accessible through traditional communication efforts like email campaigns (Dunn, 2015). Bystander intervention has to compete with other responsibilities and other health concerns. Alternative approaches to capture attention are needed.

Washington State University implements the Green Dot Program, a nationwide bystander intervention directive. All incoming students complete a workshop a week before classes begin informing them about how to identify escalating nonconsensual situations and ways to intervene, even when it might be challenging. The focus is preparedness and support of fellow students. Although the program has shown promise in bettering attitudes and raising awareness (Adams et al., 2013), one concern of the practitioners who run WSU Green Dot is whether students maintain what they learn. Prior to this study, email was the only way Green Dot stayed in touch with students. Unfortunately, college students are inundated with emails and can be selective in their attention (Wenze & Miller, 2013).

Cell phones, which students have ubiquitous access to, are an effective way to reach young people with health information. Text messaging is a promising way to connect with college audiences (Muench et al., 2013; Moore et al., 2013). Text messaging offers the benefits
of privacy, convenience, and confidentiality. Thus, this technology may be a beneficial way to reach college students with information relevant to sexual assault and bystander intervention. One purpose of this study was to test the effectiveness of a text message intervention for Green Dot to sustain attitudes and knowledge from the in-person orientation, including an evaluation of whether students found the system acceptable, and if it was a reasonable method for practitioners to use in the future.

Text messaging, to date, has already been confirmed a feasible method for distributing health interventions (Bock et al., 2012; Head et al., 2013). As such, the field of intervention literature needs to shift toward not just testing whether text could work, but rather, to how research can make those interventions even better. This comes from an adherence to formative research that includes both theoretical foundations for message design and ample and diverse message pretesting prior to intervention work (Atkin and Freimuth, 2001).

As a result, beyond simple feasibility of a text system, this study reports on pretesting of messages that were created using an established, theory-driven approach. Further, this theoretical foundation is used to examine changes in student motivations across a semester. Self-determination theory, which hinges on the concepts of autonomous choice regulation, competence, and community relatedness (Ryan & Deci, 2000), is used in a wide variety of health contexts today. Having higher levels of each of the three concepts typically results in greater personal motivation to complete a behavior, such as bystander intervention. In effect, a person should feel like they are making the choice to help, have the right tools to step in, and feel supported by peers and the community when they do so. Two sets of messages were developed, both meant to foster these attitudes. However, one set was created using autonomy as a guide for how situations were presented. In other words, students were not messaged that they had to do
something. Rather, they were given options and personal choices, while the other set of messaging was more directive. These messages just told students the action was an imperative: they should take action, always. Therefore, the theory portion of this paper discusses how those two strategies could be used in an intervention setting, and which one could be more useful to practitioners.
CHAPTER 1

ISSUE BACKGROUND AND PLATFORM

Sexual Violence and Bystander Intervention

Sexual violence is a pervasive problem. A worldwide study found that 7.2% of people have been the victim of sexual violence (Yount, 2014). However, the real prevalence of the problem may be hard to pin down. There are problems in the reporting of sexual violence, both from the side of victims who remain quiet for many reasons, but also researchers who often forget to poll men or older women (Lawry et al., 2011). Different definitions may also prove difficult, as many studies fail to define sexual violence, or take a much broader look at sexual victimization, which includes acts such as cat-calling and other inappropriate, unwanted sexual advances (Turchik & Hassija, 2014). Regardless of a strict definition or exact figures, one fact is consistent: sexual violence is a human rights violation and an awful occurrence that needs to be investigated and understood (Yount, 2014; Lawry et al., 2011). Being a victim of sexual violence can cause adverse physical and psychological conditions (Yeater et al., 2008). Both cultural and normative, these effects unfortunately leave many victims more susceptible to future sexual violence (Turchik and Hassija, 2014), a never-ending cycle that often marginalizes minorities and women (Stewart, 2014).

College students may be particularly susceptible to sexual violence. A study of sexual victimization (Turchik and Hassija, 2014) found that 72.8% of college women reported at least one instance of victimization since the age of 16. This is often attributed to the fact that students are still trying to figure out how to act and make their own decisions, being away from home for the first time (Bennett, 2014). Further, college students are high risk takers. This, along with
drinking habits, has been linked to sexual assault victimization (Turchik and Hassija, 2014; Yeater et al., 2008; Potter & Stapleton, 2012).

The cause or trigger of sexual violence by men has been oft-studied. Most link the issue to problems of norms about hypermasculinity (Potter & Stapleton, 2012). Men are often judged by their supposed sexual conquests. Being sexual and dominant is part of a constructed masculine ideal in much of western culture. The result is pornography with explicit sexual violence and the spreading and acceptance of rape myth culture (Stewart, 2014). Another issue pointing toward the root of the problem is the conceptualization of consent. Many programs to prevent sexual violence focus on education about consent (Yeater et al., 2008). However, a study by Jozkowski and colleagues (2014) found that knowledge of consent between the genders was equal. The difference was about how consent can be given. Men were more willing than women to count nonverbal cues as consent, compared to spoken acknowledgement.

As factors that contribute to sexual assault have been identified, practitioners have worked to created interventions that address the issue. Many are focused on changing norms, especially among men (Stewart, 2014). For college students and other young adults, the use of social media to spread normative behavior and information has also been popular (Potter & Stapleton, 2012). Unfortunately, there is insufficient information about the types of programming people prefer (Yeater et al., 2008), which can lead to some forms of psychological reactance. College students, especially, do not appreciate the loss of freedoms that might come from traditional knowledge and norms-based interventions (Silvia, 2006). One way to avoid this is to focus on empowerment and helping others. An approach quite popular in sexual assault prevention literature today is bystander intervention.
The roots of the bystander intervention approach came from observing the opposite of being proactive: people in crowds are often unresponsive to emergencies. Darley & Latané (1968) famously studied this phenomenon in widely replicable studies. People were put into rooms, either alone or with a group. Some emergency was then staged. The time to reaction, if it even occurred, was measured. Consistently, people in groups reacted at a lower rate and more slowly. The research that came from this line of study suggested that people tend to “diffuse responsibility” among the crowd (Darley & Latané, 1968). This phenomenon was seen regardless of gender, with many other variables at play for why people might or might not act (Darley & Latané, 1970). These variables are often referred to as barriers to helping.

Research on barriers to helping has found that intervention behaviors start early. Witnessing bullying at school and stepping in to prevent it is one example. A lack of emotional empathy was found to be a barrier, as those children without a strong reaction to displays of bullying were less likely to help (Barhight et al., 2013). Closely related to this is whether or not the victim is someone a potential bystander knows. Research on cyberbullying found that anonymity of the victim or the bystander decreased intervention behaviors, but that knowing the person being bullied increased helping (Brody & Vangelisti, 2016). Akin to many other forms of behavior research, low self-efficacy, defined as a person without inner confidence of their ability to act, can also be a barrier. People without the confidence to intervene are much less likely to help (McMahon et al., 2015).

These barriers tend to persist when considering the issue of sexual violence. Among college-aged men, another strong barrier tends to be norms, or the widespread and accepted beliefs about behavior and culture in a group (Brown & Messman-Moore, 2009; Leone et al., 2016). When peers support sexual aggression through the celebration of date rape and sexual
conquests, the result is fewer men willing to step in when situation escalate. This closely relates to the issue of hypermasculinity discussed earlier – it just isn’t manly to intervene (Carlson, 2008). This problem is exacerbated when adding certain community standards, with urban populations having lower involvement in bystander behaviors. Males from urban areas have particularly high rape myth acceptance and low bystander involvement (Diamond-Welch, Hetzel-Riggin, & Hemingway, 2016). Further research on specific barriers to sexual assault bystander intervention have been scarce (Bennett et al., 2014), but the call to use this approach is growing (Exner & Cummings, 2011).

Bystander intervention programs to curb sexual assault are becoming very popular on college campuses (Coker et al., 2015). With a focus on reducing barriers to intervening, most have some normative education (Gidycz, 2011), while others focus more on efficacy-based training. For example, teaching students how to identify problematic situations at a party or how to talk to a friend about date rape (Coker et al., 2015). The results have been promising. Most participants, at the very least, increase their knowledge of the subject (McMahon, 2015), with many changing their normative perceptions (Gidycz, 2011). Students on a campus with a bystander intervention program have lower victimization rates that those without (Coker et al. 2015).

The Green Dot Program

Adopting a bystander intervention approach, the Health and Wellness unit from Washington State University started using a program called Green Dot in 2008. A national campaign, Green Dot has a simple premise built around the idea of a map of a town or campus. People identify places on the map where so-called “Green Dots” situations occur – those where people supported each other and the community and fostered a safe experience. Contrastingly,
“Red Dots” are situations where violence and unwanted sexual contact occurred on the map. The hope of the program is to increase bystander intervention so that eventually red dots disappear or are completely overpowered by green dots. In this way, it’s as much a shift in community norms as it is teaching skills for identifying situations and intervening.

All incoming students at Washington State University are required to attend a one-hour, in-person Green Dot workshop session to remove registration holds. Though truncated from longer programs the unit offers, this session is often the first mention of sexual assault as a problem and bystander action as a solution to students. Designed and presented by topic experts, the in-person workshops cover everything from how to spot problematic situations to how to talk to friends about date rape and relationship violence.

An internal review of the program from the 2012/13 school year revealed improvements in feelings of community support, competence to intervene, and motivation to intervene among Green Dot participants from pretest to a three-month follow-up (Adams et al., 2013). Despite relatively promising outcomes from the program, the same report notes a need to increase involvement from students beyond the initial workshop. Previously, students were asked if they wish to complete further in-person workshops via email invitations. Outside of these additional sessions, no other follow-up of information or evaluation is provided. Attendance at further workshops is very low (<5%) according to the leader of the program. Focus group participants also mention that it is hard to recall anything specific from the sessions beyond the general message of intervention. As such, exploring other avenues to engage with students is a priority for the program moving forward.

Text Message Interventions
One strategy that is becoming increasingly popular to replace email reminders is text message reminder systems. The advent of short message systems (SMS) has led to a bevy of feasibility and medication adherence studies in the literature (e.g., Cole-Lewis & Kershaw, 2010). Text interventions are particularly message-focused, as they are limited to 140-160 characters at a time, and are usually sent without multimedia. This means that every word counts, and a strict focus on health theory is needed to produce the best effects (Mason et al., 2015). Further, timing these messages is important, as a decreased or personalized frequency can lead to greater text message program efficacy (Head et al., 2013). While no strict guidelines have emerged, consistent scheduling (Spohr et al., 2015) and avoiding daily texts (Finitsis et al. 2014) are good basic strategies for this approach.

Text messaging has been highly favored in health communication interventions because it is relatively cheap, fast, and produces strong effects (Moore et al., 2013). These advantages are combined with the ubiquity of the platform and its mobility. Text interventions can happen in real-time and in natural settings. This means the technology is often paired with methodological approaches like ecological momentary assessment (Shiffman et al., 2008) and adherence reminders (Cole-Lewis & Kershaw, 2010). The former refers to repeated diary-like evaluations of day-to-day life, while the latter are simple push notifications that remind a user to take medication or something similar. In other words, messaging can go directly to participants, no matter the time or place.

Another strong advantage for text interventions is how well-received it tends to be by participants. Texting is less confrontational and demanding than in-person programs (Laursen et al., 2012), as well as convenient for those who are busy or otherwise unable to complete long web-based interventions. Young people, in particular, often rate texting as the best approach for
interventions (Bock et al., 2012; Ranney et al., 2014). Since text messaging can be simple, conversational, positive, and tailored, it makes for an excellent user experience (Ranney et al., 2014).

Text can also make for an excellent supplement to preexisting in-person interventions. An unfortunate reality of many interventions is that effects tend to wear off over time. This is particularly true among young people (Hamel & Robbins, 2013), who have many other things on their mind. There is a paucity of long term results in the field of health communication (Siopis et al., 2015). Text messages may be a solution. The simplicity of reminders, including those that are tailored and re-address information, could help to sustain intervention effects much longer than studies without follow-up.

Of course, there are some limitations to the platform. The same conciseness of messaging that could be seen as an advantage may also make text a poor choice for interventions that require a lot of content or multimedia. Text messages can be easily ignored (Cole-Lewis & Kershaw, 2010), and some people either lose their phones or change numbers during interventions (Muench et al., 2013). The speed at which the field began using text messaging also means that reporting of results and use of theory with this approach has been scarce (Mason et al., 2015). Indeed, concepts from theoretical models may be harder to fit into short texts. Manipulations may not be as strong because content is delivered over a long period of time (Cole-Lewis & Kershaw, 2010). Text also has similar attrition issues, like high dropout rates, to web-based interventions (Finitsis et al., 2014). Despite these drawbacks, the platform is still quite popular.

Text-based interventions can be improved through a strong use of theory (Mason et al., 2015), but also careful consideration of message design. Pretesting and using established
messaging can also aid in text message intervention development (Willoughby & Furberg, 2015). Evaluating target audiences is a key. Language use within texts – such as slang, abbreviations, and emoticons – differs based on demographics (Panckhurst and Moise, 2013), as do response rates (Bexelius et al. 2009). In other words, the best text interventions will come from researchers that complete formative research steps in evaluating their audiences and messages. In the case of this study, the audience was college students.

**Young People and Text Interventions**

Millennials, people born roughly between 1985 and 2005, have grown up with an unprecedented amount of exposure to the Internet and mobile media. PEW data shows that 98% of all college-aged individuals in the United States own a cell phone (Anderson, 2015), and more than 92% have a smart phone (David et al., 2015). Most use their devices to download apps for entertainment and social purposes (Potgeier, 2015). Nearly all users send and receive text messages (Anderson, 2015), a fact that suggests using this approach might also be a great way to learn more about this audience.

A study by Bexelius and colleagues (2009) found that text messaging was not as useful for collecting data as traditional phone calls, except among young people. This was supported by more recent research done concerning patient follow-up calls (Regan et al., 2015). Young people responded more often to text and were more willing to reply honestly. This holds true in intervention literature, where young people find text to be less confrontational or demanding (Laursen, 2012), as well as educational settings, where students enjoyed the use of text for providing answers to questions in class (Reimers & Stewart, 2009).

Some research suggests the linguistic cues of text messaging resonate well with young people (Panckhurst & Moise, 2013). Further, mobile devices may often be seen as an extension
of self for young people. This is the idea that something external from the physical body has become part of a person’s self-concept and reflects part of who they are as an individual (Lancaster & Foddy, 1988). It is a personal space, but still does not trigger as much anxiety as a face-to-face collection method might (Cocco & Tuzzi, 2013). Novelty may also play a role, as young people prefer to be on the cutting edge of communication technology use (Potgeier, 2015).

Intervention research has looked at attributes that predict participation, but these studies are specific to certain types of health ailments (e.g. Crisp & Griffiths, 2014). In short, findings suggest young people are more likely to participate based on the health issue being salient to them (Crisp & Griffiths, 2014), or if presented in a style that matches well with their preexisting habits (US DHHS, 2014). As such, it’s important to understand how text message interventions have been used in previous sexual assault prevention programs and whether students consider this a salient issue on a reasonable platform.

**Text Message Interventions for Sexual Assault Prevention**

As noted previously, there have been a variety of sexual assault prevention programs attempted by universities in the past. They are typically similar to each other in content (Anderson & Whiston, 2005) and further, share one core problem: they only occur at a single point in time (Breitenbecher, 2001). Green Dot, previous to this study, shared this problem, identified by the Health Promotion staff. Indeed, there have been bystander intervention programs tested in the literature, with both offline (Banyard, Moynihan, & Crossman, 2009) and online (Kleinsasser et al, 2015) formats. Although successful, these do not include a mechanism for long-term sustenance of knowledge or attitudes. Research on these longer sexual assault interventions are scarce and need more support (Sinozich & Langton, 2014).
One area that could be considered a close corollary would be text message interventions for general sexual health. These have been more common in the literature, looking at topics like sex risk reduction (Suffoletto et al., 2013) and pregnancy prevention (Bull et al., 2016). Importantly, this field has considered the risks and benefits of sexual health text campaigns. Advantages of the platform include convenience, privacy, and reduced stigma comparative to other modes of intervention (Broaddus & Marsch, 2014). Further, there is evidence text may reach important audiences. For example, sexually experienced teens, and thus those more at risk, were more likely to engage with a text message service called BrdsNBz (Willoughby, 2015). Although these were not programs meant specifically for sexual assault prevention, the topic of sex coming from a text platform seems acceptable to young people.

As for actual programs and evaluations of sexual assault prevention interventions through text, very little has been attempted. However, that may be changing. Student researchers at University of Rhode Island and SUNY Plattsburgh have been looking into the technology as suitable for assault prevention and crisis support. Findings to date have been mixed, with a 4-week program not influencing attitudes and knowledge (Chiriboga, 2016), and a small number of people engaging in a text crisis line (Noble, 2016). However, several systems are in place nationwide. The Rape, Abuse, and Incest National Network (RAINN), for example, offers crisis management for sexual assault as well as education for reducing sexual assault (2017). Further, National Public Radio (NPR) has reported on several universities beginning to levy text and mobile technologies to curb sexual assault on campuses as a response to increasing cases of victimization (Summers, 2016).

Therefore, it appears the platform is becoming acceptable to researchers and participants. Further, the topic is pressing to the target audience. A timely investigation into text messages as
a form of sexual assault prevention is needed. This study will provide that by looking at audience reactions to the technology, as well as a formal investigation of the effects of the intervention across an entire semester.

*RQ1: How will a text-based system for receiving bystander intervention materials be evaluated by college student participants?*
CHAPTER 2
THEORETICAL FOUNDATIONS

Theory and Pretesting as Tools for Better Text Interventions

Although promising (Cole-Lewis and Kershaw, 2010), text-based and other mobile health interventions are still relatively new, and this novelty means that some researchers fail to use best practices, such as using established messaging (Willoughby and Furberg, 2015). When developing these studies, the focus may be solely on the feasibility of the technology and not on the behavior change outcomes of the intervention. One way to avoid this pitfall is a strong adherence to the use of theory and pretesting messages to ensure they are acceptable to a target audience (Atkin & Freimuth, 2001).

In the broader landscape of research, using established theory is typically seen as a formative step in research design and lends to the building of strong academic paradigms (Glanz et al., 2008). In other words, theory is a platform to build upon and improve future research efforts. After asking a particular question or posing a problem, established and empirically-tested theories serve as a first step for proposing solutions. In health, this is a seen as preclinical and not only predicts confounds, but also design considerations for interventions (Campbell et al., 2000). The entrenched concepts from these established and tested theories provide guidance for new study designs.

Similarly, pretesting can head off confounds within intervention messaging itself. Often seen as one step in a systematic approach to forming best practice messages (Whittingham et al., 2008a), pretesting gives the authors of a study insight into how audiences will react to their communication efforts (e.g. Davis et al., 2013). This is often traced to how acceptable the messages are, considering concepts such as clarity, believability, relevance, and persuasiveness.
Further, pretesting can make certain that particular stimuli are actually present in an experimental design. For example, if the study wishes to show differences between two messages strategies like gain frames and loss frames, a pretest could ask participants to rate whether the message discussed a potential benefit or hindrance.

Despite this importance, health communication research may not be using theory and pretesting as well as it could. Meta-analysis has revealed that only a third of studies in the field use theory (Painter et al., 2008), and when it is mentioned, how it is actually applied is inconsistent (Prestwich, 2014). Treweek and Sullivan (2006) asked researchers about their pretesting practices and found only half were reporting the practice in their published findings. This suggest more can be done to ensure fruitful interventions, especially during cases when innovative communication systems are thrown into the mix. Without much foundational knowledge of a platform’s efficacy, theory and pretesting become even more important (Pingree et al., 2010).

Message development for mobile health is a perfect example. The purpose of theory in this case is both directional, as well as grounding. Developing messaging is particularly important in this field because the wrong messaging can be counterproductive to health goals (Whittingham et al., 2008b). Without theory as a guide, researchers are left to develop their own texts, apps, or visuals. Atkin and Freimuth (2001) reject this strategy, suggesting that formative research, with a focus on audiences and theory, should direct message development, followed by rigorous pretesting. Unfortunately, many researchers cite a lack of time and money to do pretesting (Treweek and Sullivan, 2006). Theory, then, must stand on its own to guide the creation of usable content in these cases. Threlfall and colleagues (2014) contend that theory
alone can replace pretesting when it is otherwise not feasible, but the ideal situation in research includes both.

Of course, theory must also be tested rigorously (Michie and Prestwich, 2010) while new pretesting methods are considered, and mobile health communication may be a good arena to do both. Assuming theory is used consistently to develop mobile health interventions, the success or failure of those pieces can help to refine portions that may need to be updated for a modern society. Riley and colleagues (2011) suggest that new theories may blossom from the dynamic media landscape of the mobile generation. Further, pretesting using the mobile phone itself could help to make the environment of the method more realistic to the final intervention (Brickman and Willoughby, Under Review).

While theory use may seem an obvious formative stage, the findings that many skip this step suggests some barriers researchers may perceive when doing mobile health research. The rapid changes of the field may be the most pressing (Riley et al., 2011). When researchers are simply trying to ask “what can this technology do?” it is hard to move to the more relevant step of “how can it be done well?” Feasibility studies are the norm in mobile health. Much more time must be dedicated to getting the technology to work that also expending time to use strong theory may be seen as less pressing or cogent, especially when those papers without theory are still being published (Hannawa et al., 2014). Promisingly, with a consensus being reached by practitioners and researchers about mobile’s use for health campaigns (Fukuoka, 2015), both parties can begin to focus less on the feasibility and more on theory. Further, top ranked journals are beginning to also stress the importance of theories in health research (Hannawa et al., 2015).

Beyond catching up to the technology and the time issues of theory use, deference to actual technological constraints in messaging design could be another hitch for researchers. Most
texting platforms allow only 140-160 characters in a message. This makes complex interventions more difficult and perhaps less effective. Theory-based messaging may be harder to fit within these limitations, and further, may be difficult for researchers to develop. Willoughby and Furberg (2015) suggest using preexisting intervention content that has been empirically tested, but very little of that exists in a form that fits within a text. Contrastingly, a use of theory may help to make messaging more uniform and less “creatively awful” (Atkin and Freimuth, 2001). For mobile health, this means the benefit of focused, simple messaging.

Finally, there may be some barrier to theory use for mobile health when considering audience reactions. Researchers may worry that the young audiences typically targeted on mobile (Bock et al., 2010) may not be receptive to messaging built from theory. Indeed, loss frames that performed well on traditional platform interventions for high-risk sexual health behaviors were found to be less persuasive to college students (Brickman and Willoughby, 2016, Under Review). However, this concern can be placated if researchers and practitioners make even more efforts to understand the theory completely. This mirrors the suggestions of many other supporters of theory use and pretesting (Noar, 2006; Whittingham et al. 2008a; Scarinci et al., 2012): audience reactions and perceptions are paramount to behavior change.

Motivational Theories in Health

The focus of many health communication efforts is the construction of messages with the intent to motivate individuals to make healthy choices. Motivation can be defined as a process where goals are initiated and sustained (Cook & Artino, 2016). This is followed by a cognitive response to performance of the goals, which helps determine if the process will be repeated (Schroder et al, 2015). How best to influence that process is covered by a multitude of studies, mainly from psychology. The roots of this field are typically traced to Albert Bandura and social
learning theory in the 1960s, which was refined to social cognitive theory with a focus on self-efficacy as a driver of behavior (1977). Other famous theories common to health behavior are the Health Belief Model (Becker, 1974) and Theory of Planned Behavior (Ajzen, 1991). Each considers certain underlying motivators as predictors for actual behavior. Most commonly, this includes struggles between what a person sees as beneficial, to what they think may be normative. Other recurring themes specific to health include the value of the health task and how hard the task might be (Cook & Artino, 2016). Countless other theories have branched off from these roots in order to better serve particular health problems.

Indeed, the strength of motivational health theory may be contingent upon what issue is being tackled. Or more specifically, what will motivate certain actions by certain people. In effect, each health problem and patient is different, meaning theories have to be applied with care (Collins, 2011). In a meta-analysis of health theories used to motivate behavior, Webb and colleagues (2010) argue that every theory has a specific attribute to change in order to influence patient decisions, so knowing the potential audience is incredibly important. This task is not simple, but is part of the job of health practitioners. The key to changing behaviors is building a collaborative relationship with clients (Collins, 2011). The advantage to this collaborative approach is a better understanding of why there might be noncompliance to a health directive. Patients who feel comfortable with their doctors might reveal more about why challenges in adherence to important healthy behaviors persists.

Unfortunately, sometimes motivation is not entirely something patients can well describe. Despite repeated efforts, some risky behaviors will never be seen as a threat to some audiences (Wu et al., 2005). In this way, motivation can be seen as coping with or even ignoring danger. Key to this is whether people think they can change or if it is easier to mitigate harm. Supporting
the change narrative over reacting to harm is important from a clinical standpoint (Schroder et al., 2015). This traces along the philosophical health debate about preventative versus reactionary care. Of course, preventative care will only work if the motivational scheme demonstrates threat to patients (We et al., 2005).

Another consideration for motivation is how the idea of health is internalized by audiences. Some argue that there is an intrinsic motivation behind being healthy (Schuz et al., 2014). In effect, instead of solely treating “health” as an outcome of motivation, it can also be used to predict and create expectancies. This suggests that sometimes nothing can be done to change the way people actively think about their health behaviors. Rather, there are nonconscious factors at play, with impulse control being part of a dual process model in health choices (Paschal, Gollwitzer, & Bargh, 2013). A person can have conscious motivation that is undermined by physiological responses, like hunger or sex drive, or even heuristic cues that create immediate behavioral actions (Guarav et al., 2014).

As such, creating change is far more complicated than a single model might suggest. This leads many researchers to combine theories to try and tease out more variance (e.g. Guertin et al., 2015; Guarav et al., 2014). Incorporating multiple theories can work to better understand issues, but there are drawbacks to selecting more than one theory to explain a phenomenon. First, researchers must be careful and precise in their definitions of the theory as many have very similar constructs (Cook & Artino, 2016). Variables can also cross-contaminate work if measures are not clear or distinct. Selecting a single theory to drive an intervention may be stronger, assuming studies properly describe theory use and why certain approaches were taken (Webb, Sniehotta, & Michie, 2010).
Motivational health work should also address criticisms, of which there exists some based around two issues: correlational data use and insufficient self-regulation. The former refers to how health behavior data is often collected from singular surveys or points in time (Weinstein, 2007). This is particularly problematic when considering health practices that require long-term adherence, such as exercise, health eating, or smoking cessation. Weinstein (2007) further argues that without more statistical validation, existing literature does not yet support the use of motivational theories in health because of the lack of sustained motivation. This builds right into the second argument against health motivation theories that suggests a lack of self-regulation. Motivation may be necessary to change behavior, but it is not sufficient alone (Schuz et al., 2014). A person must make physical efforts and requires self-regulation. Therefore, studies should be focused on motivation as a first step and sustaining effects of motivation as long as possible. There are many barriers to this process, including one that is particularly relevant to college students: reactance.

**Reducing Psychological Reactance in College Students**

Of the many ways health campaigns fail, psychological reactance may be the most relevant to young people. Reactance is perhaps best described as the “forbidden fruit” principle (Varava & Quick, 2015). By telling someone they are not allowed to do something, they will crave it more, and young people are put in this type of situation quite often. This reaction is tied deeply to the idea of freedom. First proposed by Brehm (1966), psychological reactance is a negative cognitive state where a person rejects a loss to their freedom. When freedoms are taken away, their new motivation is to return to that state of freedom in any way possible (Brehm, 1972). As an example in health, telling young people they are not allowed to drink at a certain age may result in pushback. This is highly counterproductive in behavior change studies, as there
can be outward anger toward and rejection of a health directive (Steindl et al., 2015). Participants who dislike a message because it takes away their sense of freedom are more likely to provide counterarguments that support their original state of freedom (Rains, 2013). In the alcohol example from above, this might manifest as a student arguing that their parents used to give them alcohol all the time, or that college is the time to party. The cognitive state becomes more powerful than facts, reason, or logic (Brehm, 1972; Rains, 2013; Steindl et al., 2015).

There is a large collection of literature that highlights how reactance can derail the appeal within a message. Threats to choice have been found to trigger negative cognitions (Quick & Stephenson, 2007). Reactance has been used to explain why fear appeals often fail. People reject fear as something that takes away their personal freedoms and wellbeing (Shen & Coles, 2015). Further, more exposure to a message, even if it does not trigger reactance initially, can eventually cause the negative response if the exposure becomes too great (Miller, 1976). A commercial, for example, may be neutral or even amusing the first time it is seen, but quickly becomes a pain to watch after seeing it multiple times within the television viewing experience. As such, message approaches need to find ways to mitigate reactance. Shen (2010) found empathy in messaging to be an effective way to reduce reactance to PSAs, and ultimately create a more persuasive message.

The approaches that work best for reducing reactance may be dependent upon personality factors. Emotional intelligence, or the ability to use feelings to guide thinking (Salovey & Mayer, 1990) plays a role in how messages are understood by audiences. Not surprisingly then, reactance is influenced by emotional intelligence (Middleton, Buboltz, & Sopon, 2015). In particular, men with high emotional intelligence had less reactance, whereas the influences on women were less conclusive. In general, there was less variance in emotional intelligence for
women, so reactance was more influenced by additional factors (e.g. age and topic). Other research has found personality disorders can lead to higher levels of reactance, especially if those disorders are severe (Seibel & Dowd, 2001). Other personality factors like individuation, or how much a person feels like they represent something that runs opposite to the norm, also influence reactance (Johnson & Buboltz, 2000).

The personality influences on reactance make a difference at an audience-specific level as well. Young people are particularly reactant as a population, regardless of personality factors (Buboltz, Johnson, & Woller, 2003). This has been observed readily in classroom situations. Ball and Goodboy (2014) gave students assignments in either unclear or forceful ways. Both increased reactance, as measure by challenges to the instructor and the assignment. Similar research found good relationships with students, a form of empathy, again reduced reactance (Zhang & Sapp, 2013). The same study found legitimized assignments (i.e. not busy work) also helped reduce reactance in the classroom because it allowed for more freedom through non-homework time after school (Zhang & Sapp, 2013). Relationships with parents may inform how much reactance a young person may experience. Movie rating reactance, or being angry about age restrictions on NC-17 films, was mediated by perceptions of parents’ approval (Varava & Quick). Family situations predicted reactance levels in general, with children of divorce being more likely to have the negative cognitive state than children in two-parent households (Buboltz, Johnson, & Woller, 2003). Of note to this study on text interventions, Lee, Chung, and Kim (2013) explored the adoption of a SMS alert program. Reactance was low upon invitation, but grew if the system became too intrusive. This was likely seen as a loss of freedom, which on an extension of life like the mobile phone, could be an affront to autonomy.
The relationship between reactance and autonomy can be complicated. Some research suggests the two are equal, as both are value systems motivated by freedom (Pavey & Sparks, 2009). Others posit the two to be similar, but at odds. Feelings of autonomy reduce feelings of reactance (De Las Cuevas, Penate, & Sanz, 2014). In effect, by giving someone choice, a program can completely avoid the threat to freedom that triggers reactance. In health messages, this can be demonstrated through messaging. Controlling language leads to more reactance (Miller et al., 2007). A better approach is using restorative frames that show how action can take freedom back. A good example might be condom messaging. Traditionally, asking a young person to use a condom would trigger a threat to freedom. However, if this message is framed as taking back freedom by not having to deal with unplanned pregnancy, the campaign might be more successful. It is important to note that autonomy can be actual or projected, and this has an influence on reactance. Actual autonomy refers to a person truly being allowed to choose. Projected autonomy is how others think about a person’s level of autonomy. Bear and colleagues (1980) demonstrated that if a person does not have to publicly display their loss of autonomy (i.e. their project autonomy remains intact) reactance is not as strong.

In any case, reactance has clear ramifications for health message design and is exceedingly important to consider when dealing with a highly reactant audience. Theory approaches that stress choice and avoid reactance through empathy and legitimized instructions may be a better fit for a college health text system, especially when the subject matter of sexual assault could be cause for strong reactions.

Selecting a Motivational Theory

Considering the breadth of motivational theories and the challenges of reactance, selecting one theory to drive the bulk of this study requires some theoretical aims to use in
guiding what to choose. This is part of the iterative process of theory building (Lipke & Ziegelmann, 2008) that asks to compare what a theory can offer to what the study needs to achieve. In this case, a theory will need to meet the following eight standards to meet the needs of a text-based intervention for sexual assault prevention.

Motivation as a theoretical outcome: There is no way to actually measure bystander behavior within an experimental design, so motivations to act are the outcome of importance. As such, the theory must have motivation as the dependent variable of interest.

A main attribute to use for an experimental manipulation: A core independent variable that lends itself to an experimental manipulation will make comparing results from the theory stronger than a simple comparison to a control group.

A manipulation that can fit into a text: the core variable to manipulate should be something that is simple enough to fit within the confines of 160 characters or less. As such, something that would need large amounts of time or space would not suffice.

A focus on reactance reduction: the college student sample will be more receptive to something that includes perceived choice. A strong theory for intervention will include this paradigm of autonomy as a motivating factor.

A connection to campus and peers: normative beliefs and the power of peers are important to changing young people’s perception. A strong theory for intervention will consider the climate around the individual.

A focus on building confidence or skills: The Green Dot program hopes to improve efficacy and skills surrounding consent. The best theory for this intervention will include opportunities to build that feeling of confidence.
Strong, preexisting measures: as mentioned, best practice suggests the use of established scales in health interventions (Willoughby & Furberg, 2015). Therefore, the theory for this intervention should have widely available and tested scales to be adapted.

Some connection to previous bystander and sexual assault literature: a study should push the envelope of previous literature. In this case, the preferred theory should have been used previously to broach at least some of the issues surrounding sexual assault and bystander action.

Considering each of these aims and goals, a single theory encompassed the great majority of the needs of the intervention.

Self-Determination Theory

A theory that matches all the requirements for the aims of this study is Deci and Ryan’s (1985, 2000, 2012) Self-Determination Theory (SDT). The core idea of the approach is that decisions are made based on three intrinsic factors: the feeling one has personal choice or autonomy when deciding on a behavior, one’s perceived competence to complete that behavior, and the community relatedness or support one feels about making their decision (Ryan & Deci, 2000; Deci & Ryan, 1985). Combined, these factors make up self-determination and steer motivation.

At its base, self-determination could be considered a psychological need. Research has shown it to be a natural incentive for human behavior (Sheldon & Schüler, 2011) that mirrors our preexisting goals and identity (Moran et al. 2012). In short, people crave the feeling that they are making their own decisions. The SDT approach suggests that these intrinsic motivators may be more powerful than rewards-based systems (Murayama et al., 2010). This comes from a reduction in reactance as well as adherence to several other facets of base motivational theories discussed previously. In essence, people may not want to be told what to do, even if it will
benefit them in the long run. SDT sidesteps this problem by supporting choice as the true reward (Deci & Ryan, 2012).

Further, the chance to make self-determined decisions often supports wellbeing. When the three SDT needs are met, humans are rewarded with feelings of wellbeing (Sheldon & Schüler, 2011; Kestler-Peleg et al., 2015). This has been found in studies with numerous topics, from fitness (Puente & Anshel, 2010) to workplace performance (Moran et al., 2012) to student achievement (Robinson-Beechboard et al., 2011). Ultimately, SDT is about satisfaction of a need. The three components are relatively universal (Milyavskaya & Koestner, 2011), and must each be considered when using the theory to motivate behaviors. Each of the three concepts also closely mirror concepts more common to traditional health communication literature. For example, autonomy is often compared to locus of control (Rotter, 1966), competence is used interchangeably (if incorrectly) with self-efficacy (Biddle et al., 2005), and relatedness is comparable to peer norm perceptions like what is found in the Theory of Planned Behavior (Ajzen, 1991). Therefore, health communication scholars can be certain this still fits well within typical theory strategies for the field.

**Autonomy.** The first step to a self-determined motivational state is some feeling of autonomy. Simply put, autonomy is really about the ability to make one’s own choices (Ryan & Deci, 2000; Liang & Qingguo, 2015). There can be many kinds of autonomy, from body autonomy (no one can tell people that they have to donate their organs) to financial autonomy (no one can tell people how to spend their money) to sexual autonomy (no one can tell people whom to sleep with). The latter is the basis of consent, and is very important in the bystander intervention literature (Carlson, 2008; Bennett et al., 2014; McMahon, 2015). This independence
in functioning is based on where decisions are made: internally, or externally (Van Petegem et al., 2012).

The concept of autonomy is sometimes compared to the idea of locus of control. The work by Rotter (1966) suggests that some people feel that outcomes in the world are beyond their control, while others feel they can control their own destiny. In the case of a health or social issue like sexual assault, this would point to someone’s beliefs about why the problem occurs and what determines their health or safety status. The main difference from autonomy is how locus of control deals primarily with outcomes, while autonomy deals primarily with actions (Lynam et al., 2009). People may feel they have autonomy as to whether or not they smoke, but believe that whether or not they become sick from it is entirely outside of their locus of control. Autonomy is choosing from free will, while an internal locus of control is affirming that those choices ultimately matter (Lynam, et al., 2009).

At the point where autonomy (and the other portions of SDT) is fulfilled, a person’s choices are often referred to as being a form of autonomous regulation. This can be considered self-endorsed functioning, where the individual has internalized regulation, leading to true motivation (Van Petegem et al., 2012). This is inherently fulfilling (Ryan & Deci, 2000) because there is no directive in play. A person does not have to, they actually want to. There is evidence that interventions are most effective when harnessing this type of regulation, and need more exploration into how autonomy influences young people (Ryan & Deci, 2012; Joseph et al., 2005).

**Competence.** The second portion of the SDT focuses on beliefs about a behavior and how they might be performed. In essence, competence is the need to be able to complete a task (Rodgers et al., 2013). In this way, it is often compared to self-efficacy. Made famous in Social
Cognitive Theory, efficacy refers to the belief that you can execute a behavior (Bandura, 1986, 1997). In short, “can I do X.” However, competence goes beyond this by suggesting there is a need to pursue new experiences and tackle challenges (Deci & Ryan, 2002). Having self-efficacy might apply to something like feeling able to walk to work, whereas competence is overcoming the challenge of walking to work for the first time, or walking much further until it becomes a novel challenge. Research has shown the two concepts to be similar but not interchangeable (Biddle et al., 2005). Efficacy may help with simple adherence to a behavior, but competence ties to actual wellbeing from completing a task (Senecal, Nowen, & White, 2000).

Though often tied to a proposed action, competence can go even deeper than just ability to perform and a need for challenge. Early work on competence suggested that the intrinsic need competence fulfills is dealing with our environment using playful and exploratory behavior (White, 1959). This could be exemplified by explorers or someone climbing to the top of a mountain. In effect, there is this need to “conquer” a space around us (Deci & Ryan, 2002). In the context of a community problem like sexual assault, this boils down to a need to effect change on our living space (Rodgers et al., 2013). People with high levels of competence not only feel they could speak up when they see violence, but also that their voices can help the rest of the community to feel competent as well. There is personal importance to the task (Rodgers et al., 2013). This feeling can be heightened by both risk-taking (White, 1959) and achievement (Tsalavoutas & Reid, 2006). In other words, a person might feel more competent to intervene after intervening in a risky situation (e.g. in defiance of a friend) or after seeing it be successful for them or others.

**Relatedness.** Perception of what is happening around the individual making the decision to act is at the heart of relatedness. In this way, it’s often seen as the “climate” of an
environment, and how supportive it might be of an autonomous choice (Robinson-Beachboard et al., 2011). Though established within SDT, it also has other roots in theories from nursing and how early attachment behaviors form. Hagerty and colleagues (1993) used this concept to establish a theory of human relatedness, which refers to our connection with others. Further, it states the material and physical aspects of our environment are also key in forming these perceptions (Betz, 2004). As an example, a person may feel their workplace has less relatedness if there are actual physical barriers between them and their superiors. They have less choice in how things happen because important decisions are made behind closed doors.

The entirety of relatedness is often summed into four states of importance. These are needs for belongingness, reciprocity, mutuality, and synchrony (Hagerty et al., 1993; Betz, 2004). In that way, the concept could be compared to social support, but that again, fails to account for the physical nature of an environment. Rather, humans process relationships in many ways, with relatedness being a nurturing of the idea that both the people in one’s community and their environment itself supports one’s right to make decisions (Reis, 1994). A person may be more likely to exercise, for example, if a poster on campus offers choices in how to work out, rather than a direct command that implies working out is an imperative. Relatedness is a connectedness that supports one’s ideals while it fosters choice (Robinson-Beachboard et al., 2011).

Despite relatedness being one of the cornerstones of SDT, it is less studied than the other two components (Ryan and Deci, 2000; Ping et al., 2016). Because it is a perception connected to peers, it may be harder to influence without buy-in from those populations. The studies that have looked at this portion of the theory often use peers as an entry point to changing this feeling (Ping et al., 2016), while focusing on influencing community norms. In the case of sexual assault
prevention through bystander intervention, this may be even more relevant. In effect, students are being asked to believe that others will support their choice to speak out against violence, something that has to be supported through a community effort.

**SDT and Sexual Assault Prevention.** Similar to the dearth of text interventions for sexual assault prevention, SDT approaches on this topic are scarce. Rather, the theory is typically used as a way to explain previous episodes of involvement in coercive sex. Sex without autonomous choice is a type of sexual assault and leads to low self-esteem, depression, and anxiety (Vrangalova, 2015). Unfortunately, these situations are quite common. The problem may be influenced by submissive imagery of women in media (Sanchez, Kiefer, & Ybarra, 2006). Prevailing normative beliefs from these common portrayals make submission the normal practice for women. Submission includes no autonomous choice. Rather, it is entirely predicated upon following directive motivations: being told what to do without input. Contrastingly, sexual autonomy leads to greater arousal (Sanchez, Kiefer, & Ybarra, 2006) and does not result in the negative emotional side effects discussed above (Vrangalova, 2015).

The topic of casual sex may also shed some light on the interaction between sexual assault and SDT principles. Young people have different types of motivations for sex, with autonomous or internal motivators being the most predictive (Hardy et al., 2015). When that autonomy is not present, motivation plummets. No one, young people included, wants to be coerced into sex. Personality traits can make a difference for safer sex behaviors like condom use (Ingledew & Ferguson, 2007), but these are also moderated by autonomy. As a result, the relationship between autonomy and sexual consent is relatively clear, and connects to the suitability of theory for working with the topic of sexual assault prevention.
Beyond autonomy, community relatedness has also been the focus of some sexual assault literature, though it is not necessarily identified as such. For example, a study about conversations between young women and their mothers about sex showed how autonomy-supportiveness is rare in this arena. Women see sex as a threat to their daughters and a high-stakes issue. However, the researchers found that this type of protectiveness is overbearing and makes the young women feel as though their own autonomy is not being supported by their external influencers. As such, perceived community relatedness is low. This issue of parents and community relatedness was also touched on with a piece about sexual assault in Ghana (Bingenheimer & Reed, 2014). Coerced sex and sexual assault was more common among women who had high parental control of their actions (low autonomy) and a conflict of values with their parents that were perceived as a lack of support (low community relatedness).

Beyond these scattered clues, there is little known about how SDT principles could be used in a sexual assault prevention program, but the theoretical argument is not a stretch. Autonomy and consent are closely related concepts. Prevailing community norms could determine whether people might feel support in acting out sexual coercion or intervening when they see it taking place. And while scarce, there are also a few ties between SDT and bystander interventions.

**SDT and Bystanders.** The focus of Green Dot and most bystander training is the idea that intervention is an active choice. In other words, no one can force a person to intervene, and whether or not someone acts will reflect upon the community (think the map of red and green dots). These tenets mix well with SDT because the core behavior is a choice that influences a community. Indeed, helping behaviors are strongest when mixed with autonomy (Macaulay, 1970). Further, pro-social behaviors in young people can be motivated through SDT approaches.
(Hardy et al., 2015), so it would make sense that some research has looked into the intercept of the two concepts.

As mentioned previously, school bullying is one popular area to examine bystander intervention because it is common and often committed in public. Jungert and colleagues (2016) viewed the issue through an SDT lens. They found that a nurturing student-teacher relationship, one that supported autonomy and relatedness, led to better bystanders. Further, poor relationships had a counteractive effect. Passive onlookers were the hallmark of students from classrooms without a positive relationship between students and the teacher (Junger, Piroddi, & Thornberg, 2016).

Another interesting experiment looked at whether or not bystanders would help a robot with a task. Compliance to help was dependent upon what the person was doing at the time, as well as their autonomous motivations (Huttenrauch & Severinson, 2006). Important was the way the robot asked for help. A directive command was often ignored. This blends well with both SDT and the idea that helping behaviors are strongest not when directed, but when motivated by internal imperatives (Macaulay, 1970). People want to be helpful, but only if they feel it was their choice.

**A review: SDT fulfilling aims of study.** With SDT defined and explained, it is important to return to the original aims of theory selection in order to better explain how SDT fulfilled each requirement. This is again part of the iterative process of theory building, and takes place within the formative steps of research to ensure the approach of the intervention will be as strong as possible.

*Motivation as a theoretical outcome:* SDT is very much a motivational theory. In fact, as mentioned, it posits that self-determination goes beyond simply motivation to personal need.
Most studies of SDT see motivation to act, and actual behavior, as the outcome variable of interest (Ryan & Deci, 2000).

*A main attribute to use for an experimental manipulation:* the core of SDT is autonomy regulation. Several studies look at how this can be compared to controlled regulation (Liang & Qingguo, 2015; Van Petegem et al., 2012; Joseph et al., 2005; Junger, Piroddi, & Thornberg, 2016; Huttenrauch & Severinson, 2006)

*A manipulation that can fit into a text:* the difference between an autonomous message and controlled or directive message can be short and simple. For example, “You should agree with everything this dissertation says,” vs. “It’s your choice to agree with everything this dissertation says.” The content remains the same, but the connotation and regulative underpinning has changed (and changed enough to likely elicit a reaction to the author’s pandering.)

*A focus on reactance reduction:* being that college students need to feel they are making their own choices to reduce reactance, SDT is an obvious choice. The focus on autonomy and supporting autonomy with competence and relatedness directly tackles the issue of psychological reactance in young people.

*A connection to campus and peers:* the community relatedness aspect of SDT makes this goal simple to achieve. Texts can simply talk of the support the community has for personal choice and bystander help.

*A focus on building confidence or skills:* this aim is well suited for competence, another SDT principle. Competence to intervene and to recognize issues of consent will make for solid messaging content.
Strong, preexisting measures: Deci and Ryan have provided all the scales for SDT on their theory website. This includes several drafts of how various studies have adapted the measures for different topics. In addition, this listing shows typical validity scores as being .8 and above, with several studies backing up their use. Additionally, the health promotion unit has used these measures for Green Dot in the past.

Some connection to previous bystander and sexual assault literature: as noted, this area is a bit weaker, but the concepts hold together well. This is one area where the paper can help to expand the field and make more connections.

As such, SDT is a strong choice for an intervention to improve bystander attitudes and knowledge. This is not to say other approaches would not be successful. For the purposes of this study, SDT fit well.

A text intervention to promote self-determination. Because of the motivational and wellbeing factors present in the underlying SDT principles, interventions that promote the tenets of autonomy, competence, and community relatedness have had a high degree of success (Deci & Ryan, 2000; Russel & Bray, 2010). To date, there has never been a text-based, bystander intervention program that focuses on SDT measures, let alone one about sexual assault. However, each of the main components could be tied to advantages previously discussed regarding a text intervention. Autonomous regulation could be influenced by the personal nature of receiving texts, and its less intimidating and directive nature. Competence could be influenced through encouragement and highlighting successes and challenges in short, text-based messaging. Relatedness would be built from a supportive system that allows for asking questions without judgment, as well as a community of people all receiving texts encouraging intervention behaviors. Deci and Ryan have provided measures for health-related SDT concepts useful in
evaluating health programs on their theory website (selfdeterminationtheory.org). This includes a measure of choice regulation, which can be either autonomous or directive, competence to complete a health behavior, and autonomy support from a healthcare provider, similar to the concept of relatedness. These measures, along with a consent understanding scale tied to the content of the intervention, were used to ask a research question and propose a hypothesis. Due to the length of the study, and lack of research in the field that compares time points for effects, a research question is presented for the short-term, first half of the study, and a hypothesis for the complete intervention from start to finish.

**R2: Will there be significant differences between groups on (a) autonomous choice regulation, (b) competence to intervene, (c) autonomy support, and (d) consent understanding at the midpoint of a text-based intervention?**

**H1: Participants who receive a text-based intervention about bystander behavior over the course of a semester will score higher on (a) autonomous choice regulation, (b) competence to intervene, (c) autonomy support, and (d) consent understanding than those without the intervention.**

**Autonomy as a message strategy.** Because the core of each portion of SDT boils down to choice, one experimental group that stresses this feature was implemented for this study. Communication can be autonomy-supportive or directive-based (Liang & Qingguo, 2015). As an example, a boss could ask his or her employees to brainstorm a solution to a problem or simply order them to do something. The former would lead to more feelings of autonomy, competence, and relatedness, while the latter, while still possibly effective to solve the problem, might lead to lower levels of these outcomes.

Messages that stress the ability to make free choices have been shown to lead to motivation in a variety on contexts (Russel & Bray, 2010). In health messaging, in particular, autonomy-based messages may be stronger than those that stress directive, controlling approaches (Hagger et al., 2014; Kestler-Peleg et al., 2015). Further, this motivational approach
has had success in a variety of languages and cultures (Gagné et al., 2014). Therefore, two
message types were produced for this study, leading to another hypothesis and research question.

**H2:** Participants who receive the autonomy-focused, text-based intervention about bystander behavior over the course of a semester will score higher on (a) autonomous choice regulation, (b) competence to intervene, (c) autonomy support and (d) consent understanding than those who receive the directive-focused intervention.

**R3:** Will participants in the autonomous-focused intervention give better evaluations of the text system than participants in the directive-focused intervention?
CHAPTER 3  
MESSAGE DEVELOPMENT AND PRETESTING

Prior to undertaking the text intervention, collaboration began between communication researchers and the Washington State University Health Promotion staff. Together, this team created messaging influenced by the SDT theoretical foundation and pretested those messages with students enrolled in classes during Summer 2016.

Project Genesis and Theory Selection

In order to gain access to a greater number of students for health-based research, practitioners in the field were contacted about a potential for collaboration with communication researchers in Spring 2016. At the time, the Health Promotion staff was already considering the use of a text message system to supplement existing in-person programs. However, there was hesitation due to a lack of background within the text field, something the researchers helped to provide. In addition to providing the Health Promotion staff with recommendations for a system to adopt (later settling on the Mobile Commons platform), the research team also offered to evaluate the effectiveness of the system.

The Green Dot program was selected for the first test of the system for two reasons. First, participation for the in-person training was compulsory, meaning there would be a much higher chance of retaining a large student sample. Second, the subject matter was closer to the expertise of both the researchers and content producers within the health promotion unit. In addition, the goal of reducing sexual assault on campus was something described in early meetings as “piecwise”: every little bit could help.

Selecting a theory to guide the intervention proved more difficult. There is very little agreement within the bystander intervention literature on a behavioral theory that focuses on
active participation. As such, several options were suggested, from stages of change models, to health belief, to framing. Self-determination theory offered some advantages, with the foremost being its focus on motivation. Further, it promotes challenge through the concept of competence and community influence with the idea of relatedness. Both connected well to the difficult process of identifying nonconsensual behaviors and the courage it takes to step up and improve the community through a bystander intervention. Previous evaluations of the Green Dot program also employed SDT, leading to scales that could be compared back to previous data as needed. These buttressed the theoretical arguments for SDT as the prevailing motivation theory discussed in Chapter 2 of this manuscript.

The foundation of SDT helped to inform messaging content, scale items, and how outcomes of the project would be evaluated. However, it also introduced the experimental manipulation that could occur between messaging groups. Grown from an interest in reducing college students’ negative reactance to being told exactly what to do, the idea of an autonomous focus to messages was born. This could be contrasted against simply telling students how to act in messaging.

**Message Creation**

Initial messages for the campaign began with a brainstorming session between researchers and two members of the Health Promotion staff. This led to the creation of content “categories” built around the concepts from the in-person Green Dot training. These categories were topics found to be particularly relevant to students and their eventual attitudes and feelings toward bystander behaviors. The categories were understanding consent, preparedness, and showing a positive community of support. Therefore, all the messages were designed to fit one of these categories.
After the brainstorming session and creation of categories, content experts in the health promotion unit began writing text-length tips and reminders that could be used for the intervention. In addition to simple statements, some messages contained links to more information, or questions that participants could ponder or answer. With each message, two versions were created. For the autonomy group, messages focused on personal choice, often asking more questions or telling participants it was their choice to look or ask for more information. The directive messages asked fewer questions and had more declarative statements. However, it is important to note that these messages were still positive in nature, and had the same topical focus as the autonomous messages. Examples can be found in the final messaging sets in Table 1.

The result of the process was 16 pairs of messages. These were ordered based upon when during the semester they needed to be sent out. For example, some messages built on previous concepts. The more complex messages with questions and potential student feedback were put later in the order to not overwhelm participants. It was acknowledged that not all the messages would be needed for a 14-week intervention with one text per week. Due to this, and to check that the messages were acceptable to a college student audience, pretesting was completed to identify which topics to drop.

**Pretesting**

This study employed both quantitative and qualitative pretesting of the potential intervention messages.

**Survey.** Students enrolled in a summer communication course were asked to complete an online message testing survey. Each message in one of the two sets (autonomous or directive) was displayed for the participant in a randomized order. Messages were rated on 7-point Likert-
type scales for the single item outcomes clarity, believability, relevance, and whether the message made them feel independent. After viewing all the messages, participants completed short scales for how autonomy-focused the messages felt ($\alpha = .76$) and the acceptability of the messages ($\alpha = .88$). Full measures can be found in Table 2.

In total, 50 students completed the pretest survey in its entirety. Gender was nearly evenly split, with 26 males and 24 females. More than half (54%) identified as White, with 16% Hispanic, and 12% Asian. Four of the participants were international students, and two-thirds remembered at one time attending a Green Dot session at WSU. The average age was 20.92 ($SD = 1.81$), and most of the participants were juniors (44%) and seniors (36%). This sample was a bit older and more removed from the first year of college that the potential target of the intervention – likely a result of pretesting in the summer when most students are older. However, Green Dot is also a training for older transfer students, and the later focus groups revealed even older students found the information relevant and pressing to their peer group.

After data cleaning, the autonomy and directive message groups were compared using t-tests. Tests for assumptions revealed no issues with employing parametric tests on the data. The results showed that the autonomy group scored significantly higher on the autonomy scale, $t(48) = 2.44, p < .05$, the acceptability scale, $t(48) = 2.39, p < .05$, the relevance outcome, $t(48) = 3.19, p < .05$, the believability outcome, $t(48) = 3.112, p < .05$, and the independence outcome, $t(48) = 2.21, p < .05$. The difference for groups on the clarity outcome was not significant. As such, messages for the autonomy groups were seen as more autonomy-supportive, and were more well-liked than the directive messages. Further, in each topic pairing, the autonomous message was always scored higher on independence, and higher or the same on relevance and believability, adding further evidence that the manipulation was successful.
In general, scores for the messages, regardless of grouping, were high (see Table 3 for general descriptive statistics. In particular, message clarity averaged above a 6 on a 7-point scaled. There was little doubt that participants understood what they were reading. Further, the overall feedback participants provided in an optional open-ended suggestions box was positive. Highlights include the messages being called “informative” and “needed on our campus.” Of note were a few messages that scored lower than others on most outcomes. One told students that they could “try again next time,” which received the lowest overall scores.

**Focus Groups.** Following the survey-based message testing, some students were invited to attend focus groups to talk about messages in a more general, open-ended discussion. A total of 6 men and 5 women attended gender-split groups. First, the participants read one message set (autonomy or directive) in its entirety and were asked to mark which they liked and which they did not like, as well as anything else they noted of interest. Then a discussion of those messages was informed by a semi-structured script asking about both liking of the content, as well as the idea of autonomy and what could make the messages better. Next, participants read the other set with similar directions and discussed with the same questions. Finally, participants were asked to compare the two message sets. The order of the sets was presented at random, with women receiving directive messages first, and men receiving autonomous messages first. Discussions were recorded and the moderator took notes about how to change or improve the messages based on feedback. Analysis of this material involved a close reading for emergent themes and the amount of discussion on certain messages.

Focus group members found the messages generally positive. The men concluded the topic was particularly important, though few could recall ever receiving a Green Dot training. Women enjoyed the messages, but noted that some students might not take them as seriously as
they should. One female summed the list as “…optimistic. I want to believe that, like, you know, people will really, I guess, think about it, but who knows?” Both groups also offered suggestions in how the overall sets could improve. The men enjoyed the idea of the system being responsive and having chances to follow links for more information. As one student put it, “that was kind of cool. Like, I could see myself bored in class clicking on it or whatever, you know, to kill some time.”

Comparisons of the two sets were more mixed than in the results of the survey. However, both still identified one set as being more autonomy-supportive. One male noted “this one has way more, like, options or something. It asks more questions and stuff like that.” However, the decision on which set was better had more contention. Men voted 5-2 in preference of the autonomy messages. However, women voted 5-0 in support of the directive group. This gender difference did not appear in the survey data, and could be linked to how discussions progressed about the messages. Most importantly, the female group discussed how consent and intervention are something that should be a directive – in other words, people should not have the choice to decide to intervene, they just need to do it. “I don’t like that this one seems to take it less seriously,” said one female participant. “That seems kind of dangerous, right? Understanding consent is not a choice.” Men never had this philosophical debate, and seemed less concerned about the deeper topic as compared to just which messages sounded better.

One area that had wide agreement, however, was which message to drop from the program entirely. Just like in the survey, participants criticized the “try again next time” message. As one male put it, “that (message) was kind of insulting. Like it was mocking us or whatever, you know?”
**Messaging Changes.** The findings from the pretests resulted in some changes to the messaging. First and foremost, the offending “try again next time” message and its autonomous pairing were dropped entirely. Several other messages had small tweaks, including two messages that needed to be shortened due to the texting character limit. Three other message pairs with lower scores were dropped to fit within the time period for testing the intervention. The health promotion unit made these final decisions, also finding that at least two of the messages seemed redundant or did not address something specific to the Green Dot training. Without pretesting, these issues may not have been apparent on first brush.
CHAPTER 4

INTERVENTION METHODOLOGY

A text-based bystander intervention program was completed on the Washington State University campus in Fall 2016. Pretest, midtest, and posttest surveys were administered to participants to collect attitude and evaluation data.

The Mobile Commons Text System

With messaging established, a system for text delivery was contracted by the health promotion unit. Mobile Commons is an automated text message service that works primarily with nonprofit and health organizations. The system manages participant phone numbers and message delivery. Phone number information can be kept private if researchers or practitioners want the numbers to be anonymous within the user interface. Further, these participants can be broken into groups, allowing for the experimental manipulation in the study. Messages can easily be scheduled ahead of time, allowing for content to be sent at specific intervals without the need for a reminder to the researcher.

In addition to the basic features, Mobile Commons allows for two-way interaction with participants. There is functionality for the use of links within the texts to lead participants to additional relevant information or multimedia. Further, it allows for preset responses to text questions. For example, if a researcher wished to ask a direct question in the text (e.g. Respond 1 if you have exercised today, etc.), they could receive a response from participants that has further automation, like a congratulatory message. Finally, users can also directly message the system with their own questions, allowing for researchers or health professionals to respond to more specific concerns and questions.
Prior to the study, a Mobile Commons representative collaborated with the research team to work on functionality and prepare for any message constraints. The representative was advised of the type of intervention and offered suggestions on how to group participants for mass texts. Further, this was the point of contact for any technical issues with sending or receiving texts. The system had a cap of 25,000 texts sent by researchers for the semester, which influenced some considerations for future use. A member of the health promotion unit ran the system separate from the researchers and worked more closely with the Mobile Commons representative. During the semester, the platform was used to send intervention content and invitations to surveys to evaluate the system.

**Recruitment and Sample**

All incoming undergraduates at Washington State University are required to attend a Green Dot Workshop to have registration holds lifted. These sessions are held during the university’s Week of Welcome, which occurs prior to the start of fall semester classes. Content experts explain a variety of concepts from consent to bystander practices. Participants for this study were recruited at the conclusion of these workshops during a short survey meant to evaluate the session. Students were not required to fill out the survey but were encouraged to do so by using their mobile phone. The leader of each session explained the research and why it was important to have people sign up. Participants interested in more information before signing up were asked to contact the research team.

At the end of the evaluation survey, students could opt into receiving texts each week about Green Dot. They were also asked if they would like more information about Green Dot programs. Anyone who signed up for the texts was placed in either the autonomy or directive group randomly. Participants who asked to get updates about Green Dot events or trainings, but
not the weekly texts, were placed into the control group. All participants were informed they would be invited to participate in three surveys later in the semester. There were no incentives for simply signing up, but every incoming student over the age of 18 was given the opportunity because of the sessions. If participants came to a session later in the semester as a make-up and missed the start of the messages but were still interested, they were signed up for the system but did not receive any survey invitations.

In total, 4,355 students attended workshops during the Week of Welcome and first week of classes for makeup sessions. More than a quarter (1,242, 28.5%) signed up for either the texts or the Green Dot announcements or both. After sorting, there were 242 (19.5%) students in the control group, and 500 (40.25%) participants in each experimental group. Over the course of the semester, 36 students from the control group dropped out of the message system, 62 from the directive message group, and 53 from the autonomous message group, for final numbers of 206 for the control, 438 for the directive group, and 447 for the autonomy group. The largest dropout dates corresponded to follow-up invitations for surveys and were primarily at the start of the program by people who had yet to receive more than one or two messages. In fact, only 7 dropouts occurred from the time the final survey invitations were sent out to the end of the semester.

Participants were invited to complete the surveys through the text system. The need for participants was stressed during each text, as was the inclusion in a drawing for $20 in cash. Each solicitation for the survey mentioned that there were three short surveys in total. As an example, the first solicitation of the semester read: “We want to learn more about our texting system. Take the first of three short surveys to help. You will be entered to win $20!” Respondents were identified within the survey by a self-reported phone number, which was used
to contact them if they were drawn for a prize and to connect data from the three points in time. However, that number was separated from other responses prior to data cleaning. During the midtest, there was a short error in the Mobile Commons system, meaning that some students did not receive the initial invitation text. However, all invitations had a follow-up the day after in case students had passed on their first opportunity. Because of limits to controlling who received messages and who already took the survey, even participants who had already taken the survey received this follow-up, which likely led to additional system drops. Importantly, none of the survey respondents were identified to be a person who accidentally took the survey twice.

During the pretest, one week after the trainings, the total response rate was 11.4%, with 15 participants in the control, 54 in the directive messaging group, and 73 in the autonomy messaging group. The average age of participants was 18.86, as almost all were incoming freshmen (with a few transfer students). About three quarters of participants were female (78.2%), with the same number of white participants (78.2%). Nearly all (92.3%) participants listed English as their first language. None of these demographics varied significantly between groups.

During the midtest, which occurred after 6 six weeks of messaging the response rate dropped to 8.1%, with 11 participants in the control, 41 in the directive group, and 34 in the autonomy group. At the posttest (after all 12 messages were sent), additional incentives were offered. This improved the response to 16.4%, with 23 participants in the control, 69 in the directive group, and 76 in the autonomy groups. Across all times, the response rates by group were not significantly different. The number of participants who completed all three surveys was only 12 (or .01% of the total system population).

**Messaging and Survey Schedule**
The frequency of the text messages was determined based on previous literature and studies that suggest one text message per week may be optimal for a health-based intervention (Bock et al., 2012; Ranney et al., 2014; Muench et al., 2013; Cole-Lewis & Kershaw, 2010; Finitis et al., 2014; Brickman & Willoughby, Under Review). Additionally, this was the frequency agreed upon by a majority of focus group members in pretesting. To further avoid overload, survey invitations were sent on weeks that participants did not receive content, outside of the pretest, which was delayed due to addendum issues associated with IRB approval. The schedule was managed on the Mobile Commons system and was set up at the start of the semester.

In total, the intervention included 12 content messages sent over 14 weeks. Throughout the program, content texts were always sent at 2 p.m. on Thursday afternoons to stay consistent, following the advice of Spohr and colleagues (2015). This also more closely precedes the common party days (Thursday, Friday, and Saturday) where students might run into issues of consent or bystander intervention. Participants received the three surveys in weeks 1, 7, and 14 of the semester on Tuesdays, with the reminder on Wednesdays. The entirety of this schedule is available with the messaging found in Table 1.

After the posttest survey, participants were also invited to a series of focus groups to discuss the system. However, because this occurred during the final week of classes, and the Washington State University campus had its first major snow of the season, many students who signed up did not make it to their scheduled groups. Out of 23 students who signed up, only 3 could make their time. As such, instead of focus groups, informal discussions were held with three female participants. All 3 said they received messages once per week, meaning they were in either the autonomy or directive groups.
**Variables**

During the short surveys, participants were asked to respond to a variety of scales. Each was Likert-style with seven scale points. Question order was randomized to reduce order effects, and reverse-scaled items were included to confirm respondents were thinking about questions rather than filling in a string of the same number. The sole predictor variables used in this analysis was group membership (control, directive, autonomy), which was established by sending each group a unique survey link. Participants also provided a phone number that was used to link each survey, with those numbers de-identified before data cleaning.

**Evaluation scales.** During the posttest, in order to evaluate the overall system for R1, three scales were used to measure *content liking*, *platform preference*, and *system interactivity*. These scales were adapted from the TIPPS Acceptability Scale (Noar et al., Under Review), and asked whether participants agree or disagree with a variety of statements about the text system. The content liking scale measures whether participants felt the content was engaging and palatable, with statements such as “The messages I received were interesting” and “The messages were relevant to college students.” The scale had good internal validity ($\alpha = .84$). The platform preference variable contained statements about whether text was a good place to receive this information, such as “I liked getting this content on my mobile phone” and “I preferred receiving these messages on my phone to an alternative, such as email.” The scale had poor internal validity ($\alpha = .44$), so a reverse coded variable was removed, increasing this to an acceptable range ($\alpha = .70$). The system interactivity scale measured how customized and interactive the text system felt to users with statements like “The system seemed highly interactive” and “I felt the messages allowed me to ask questions.” Scale validity was strong for this scale ($\alpha = .84$). In addition to these three scales, there were two single measure variables
from this set that stated “You were sent approximately one text message per week. What did you think of that frequency” as a measure of *message frequency* and “I would sign up for something like this in the future” as a measure of *future intent*.

**SDT outcome scales.** In order to answer R2, H1, and H2, participants were asked to respond to three scales adapted from Ryan and Deci (2000) during each of the three surveys. Just like the evaluation scales, these included a variety of statements participants could agree or disagree with on the 7-point Likert-type scale. The first variable, *autonomous choice regulation* evaluated whether motivations to intervene were based on feelings of personal responsibility, such as “(I would intervene) because I feel that I want to take responsibility for making the people in my community safer.” This had good internal validity during all three surveys ($\alpha = .79$, .76, and .83). This scale is often accompanied by a measure of controlled choice regulation, but the results did not have strong internal validity at any time point and were omitted. The second variable established was *competence to intervene*, which teases out whether a person feels confident to intervene, with statements such as “I feel capable of taking action to reduce interpersonal violence.” The four-item scale had very high validity ($\alpha = .93$, .94, and .94). Finally, the idea of *autonomy support*, or how people feel support from the WSU community in making changes to interpersonal violence was measured. One example statement was “The WSU campus community listens to how I would do things to reduce interpersonal violence.” The scale also had good validity throughout ($\alpha = .88$, .92, and .91).

**Consent knowledge scale.** Because the Green Dot program has an interest in increasing knowledge about consent, thus increasing the chances of bystander intervention, participants were also asked to respond to a consent knowledge scale. This was adapted from parts of the Sexual Consent Scale-Revised (Humphreys and Brousseau, 2010). The statements evaluated
whether students understood the intricacies of what might be considered consent. For example: “I believe it is just as important to obtain consent for genital fondling as it is for intercourse” and “Consent should be asked before any sexual behavior, including kissing or dirty talk.” The 8-item scale had strong internal validity during all three surveys ($\alpha = .88, .92, \text{ and } .92$).

All the items within the scales used in the study can be found in Table 4.

**Data Preparation and Cleaning**

All statistical procedures and data cleaning occurred in IBM SPSS Version 20. Due to the nature of repeated measures research, extra care was needed for combining data properly from the three collection time points. Surveys were connected using student phone numbers as a proxy ID. Scales that were repeated were renamed for each survey round to distinguish results. Additionally, surveys were sent to each group using a unique survey link, so data had to also be combined across groups in addition to across time points. Numbers were also checked for repeated survey takers (a person accidentally filling out the pretest twice, for example), but none were found. A few participants incorrectly provided a WSU ID number in the first phone number response box. However, a second box for confirmation was included, which solved this issue. Once all the data were properly combined, phone numbers were changed into randomized ID numbers to preserve anonymity.

One dataset was created to only include participants who completed all three surveys. However, because this number was so low, this dataset was abandoned in favor of one that included everyone who completed at least one of the three surveys. At a survey level, participants were dropped if they did not complete the bulk of the survey questions. In most cases, this was obvious as participants stopped after inputting a phone number. Only 14 cases had students continue past the phone number question, but not complete the survey to the end.
Because the point where participants stopped was not systematic but also did not have enough data for any type of imputation, these results were also dropped (Field, 2007).

Within the remaining data, there were some missed responses. There is a complicated debate about the practices for dealing with missing data (Higgins & Green, 2011). However, it can often be ignored if there is reasonable evidence that the data is missing at random, and not for a specific reason (e.g. people find the question too personal). In the case of this data, there was no single question that had more than 2 missing responses from the participants remaining after dropping incomplete surveys. This means that most likely the participant missed the question on accident. This has been shown to be a particular problem when collecting data on mobile phones in surveys not completely optimized for the platform (Bexelius et al., 2009). Because the participant cannot view the entire survey page, anything missed when scrolling will not show up. This could be solved through the use of validation requirements built into the survey, but this might force participants who actually wanted to skip a question into answering anyway, a potential IRB conflict. Due to the random nature of the missing data in this case, nothing else was done to change those responses or fill in the data.

One additional concern with survey data that can lead to error is participants filling in strings of responses. For example, to speed up the process of taking the survey, a participant might put a “1” for every response throughout an entire survey. Obviously, this data is not particularly helpful unless the person actually felt each question deserved a “1”. The typical solution to this problem is the use of reverse-coded items (Higgins & Green, 2011). A person who is genuinely putting a “1” throughout a survey would respond the opposite (in this case, a 7) on an item where the positive or negative connotation is flipped. Although reverse coded items can sometimes reduce scale validity due to slight reading comprehension problems (Field, 2007),
the ability to act as a check on blanket responders is important. During this study, strings of same responses were checked using reverse-coded items. In 4 cases, participants put the same response for every item, including the reverse coded items. These cases were dropped before the final statistical analysis.

In total, 56 cases from the entire dataset were dropped in order to get to the sample sizes reported in this study. Each group (control, autonomy, directive) had similar percentages of cases dropped, indicating again that this was likely not a systematic issue, but rather an unfortunate reality to survey research.
CHAPTER 5

RESULTS

Tests of Assumptions

Initial data analysis revealed two problems with the assumptions needed for the use of parametric tests in the data. The first was that the data is non-normal, with a negatively skewed distribution on most outcome variables across and between groups, as well as issues with highly positive kurtosis. Previously it has been argued that ANOVA can be considered a robust test for dealing with normality issues (Harwell et al. 1992; Lix, Keselman, & Keselman, 1996). However, it has been noted that this may not be the case when cell sizes are unequal (Wilcox, 2005). During this analysis, because the control group was sampled from fewer people, the resulting cell size is significantly smaller than the experimental groups.

Because of these issues with ANOVA assumptions, alternative options were explored. Transformations are a common tactic to solve nonnormality issues. However, this does not offer a solution for unequal cell sizes, and the transformations attempted did not properly solve the normality issues. Other approaches, such as Bayesian ANOVA or GEE can be robust, but are typically more for solving issues of unequal variance and correlated outcomes, rather than the set of problems present in this data.

As a result this analysis instead employed non-parametric tests. These tests require no assumption of normality (Field, 2009), and are not significantly influenced by cell sizes (Mann & Whitney, 1947). Although the use of non-parametric tests can be considered less powerful, there was no way to otherwise meet the assumptions needed for an ANOVA without Type 1 error. Homogeneity of variance was tested for each outcome variable across groups with a Levene’s Test and was non-significant. All other assumptions needed for non-parametric tests were met.
Platform and System Evaluation (R1)

The first research question asked how participants would evaluate the system. This was answered by looking at outcomes of content liking, platform preference, system interactivity, message frequency, and future intent. The descriptive statistics for these outcome values are presented in Table 5. The results suggest an overall positive evaluation toward the system from participants. For example, the message frequency was rated right in the middle of a scale with statements that the messages came “too often” or “not often enough.” As such, one text per week was seemingly quite acceptable to students. Further, the other scales had high aggregate scores, suggesting most people liked the content, platform, and interactivity, and nearly three quarters (70.2%) of participants said they agreed they would sign up for a similar text system in the future. When given the option to continue this Green Dot text program into the spring semester, 782 students (78.2%) did so – even higher than that intent outcome.

In addition to the outcome measures, information from the Mobile Commons system also showed encouraging signs for the acceptability of the system. Only 15% of the original sample dropped out of the system throughout the semester. Dates for these dropouts correspond highly to requests for surveys, indicating that it was rarely content that queued a person to drop out of the system. A similar percentage of students (16%) got further engaged with the system by responding to text questions or asking their own questions of the system. Just more than 100 students wrote texts in response to at least one message from the system.

The health promotion unit provided the text responses from students after first screening them for any situations where identification or sensitive issues were present. Many focused on the concepts of consent, and wanting to know more information about the less obvious situations. One student asked “at what point should consent be made” while another wanted “to hear more
about real situations in which you wouldn’t think it was sexual assault, but it was.” A few students were more interested in identifying communities they might fall into, and solutions for their community. As an example, someone asked “are there groups on campus that believe in waiting till marriage?” Another was focused on the Greek system: “How can we address safety concerns among sorority and fraternity members who are part of the party culture?” Without many assumptions about how students would interact with the system, these questions were seen as highly positive signs by the health promotion unit. All were addressing content within the realm of Green Dot, and there were no prank texts.

Finally, the informal discussion with three of the participants in the text system revealed that most found it not bothersome, and generally positive. One noted “I kind of forgot about it for the week until I got the message. Then I was, like, wow, that’s pretty cool.” Another mentioned that the timing was “Perfect. It was, like, right when I was planning going out for the weekend. That really helped.” Negative commentary was entirely focused on confusion about whether or not they had taken a survey because the reminder messages went out to everyone, as there was no way to avoid sending them to students who had already participated. Two of the students said they were planning on staying in the system for spring, while the third was undecided. The topic was also seen as relevant, with one student saying “we really need this more than, I think, we think, right? Like I think it’s pretty important.”

First Test Comparisons

Prior to comparing groups after exposure to the intervention, a comparison was run on data from the first survey in the intervention to see if each group was relatively similar before receiving texts. The four main outcomes were tested: (a) autonomous choice regulation, (b) competence to intervene, (c) autonomy support, and (d) consent understanding. A Kruskal-
Wallis analysis supported the null hypothesis in each case, with scores of (a) $H(2) = 1.32$, $p > .05$, (b) $H(2) = .84$, $p > .05$, (c) $H(2) = .03$, $p > .05$, and (d) $H(2) = .04$, $p > .05$. In other words, at pretest, groups scored similarly on each of these scales.

**Midtest Comparisons (R2)**

The midtest was the focus of R2. A question was posed to see if groups would differ on the same four outcomes after seven weeks of exposure to messaging. Again, the null was supported in each case, though the scores all improved somewhat: (a) $H(2) = 2.19$, $p > .05$, (b) $H(2) = 4.99$, $p > .05$, (c) $H(2) = 4.60$, $p > .05$, (d) $H(2) = .862$, $p > .05$. Because of these results, no additional tests were run to compare individual groups and the research question was answered. There were no significant group effects by the time of the midtest.

**Posttest Comparisons (H1-H2, R3)**

To test H1 and H2, another set of Kruskal-Wallis tests was run on data from the posttest to see if there were significant group differences between (a) autonomous choice regulation, (b) competence to intervene, (c) autonomy support, and (d) consent understanding, which would allow for the investigation of direct comparisons between the control and experimental groups. This overall test was significant in all four cases: (a) $H(2) = 9.07$, $p < .05$, (b) $H(2) = 6.99$, $p < .05$, (c) $H(2) = 10.45$, $p < .05$, (d) $H(2) = 11.05$, $p < .05$. In other words, there were some differences between groups on the outcomes.

This test allowed for H1 and H2 to be considered using post-hoc Mann-Whitney tests. The necessary p-value for a significant difference for these tests was corrected to .017 (.05/3) to account for three repeated tests on each outcome (Field, 2009).

The first comparison for each outcome was between the control group and directive message group. In all four cases, the results were significant: (a) $U = 478$, $r = .30$, (b) $U = 514$,
r = .27, (c) \( U = 456.5 \), r = .32, (d) \( U = 440.5 \), r = .34. The second comparison was between the control and the autonomy group, also with significant results in each case: (a) \( U = 555.5 \), r = .27, (b) \( U = 592.5 \), r = .25, (c) \( U = 573.5 \), r = .27 (d) \( U = 533.5 \), r = .30. In other words, participants in the text conditions did score higher on (a) autonomous choice regulation, (b) competence to intervene, (c) autonomy support, and (d) consent understanding than those without the intervention. As such, H1 was supported.

H2 posited that students in the autonomy group would score higher on the outcomes than those in the directive group. However, all four comparisons showed no significant difference. Therefore, H3 was rejected. The results to R2, H1 and H2 can be seen visually in Figures 1-4, which represent group means on each outcome during each testing time.

The final research question asked whether being in one messaging group or the other would influence evaluations of the system. The same outcomes of content liking, platform preference, system interactivity, message frequency, and future intent from the main evaluation data was used with groups compared with a Mann-Whitney test. Platform preference and system interactivity were not significantly different between groups at a \( p < .05 \) level. However, there was a significant difference between groups on content liking (\( U = 2080.5 \), r = .18), message frequency (\( U = 2105.5 \), r = .29), and future intent (\( U = 1909.5 \), r = .24) at a \( p < .05 \) level. In each case, the scores were higher for the autonomy group. As such, these results suggest people in the autonomy group liked the messaging more and found a higher message frequency more acceptable than the directive group. Further, the autonomy group participants were more likely to say they would sign up for a similar messaging system in the future.
CHAPTER 6

DISCUSSION

After one semester of testing this text system, the results suggest this to be a feasible method for supporting bystander practices on a college campus. These results support previous work that suggests text is a strong approach in health (Moore et al., 2013; Cole-Lewis & Kershaw, 2010). By using best practices in message timing and scheduling (Spohr et al., 2015), as well as a theory-driven approach to messaging (Mason et al., 2015), students rated the intervention highly on acceptability measures.

More than just liking the content, participants evaluated the amount of messaging as almost perfectly between “too often” and “not often enough.” Dropouts for the system came almost exclusively after requests for participants to complete surveys. While this may be bad news for researchers, it is certainly promising for practitioners. Content does not seem to bother college students. Perhaps even more telling was the intent to do a similar program in the future and the high number of students who stayed on the program for another semester.

These results are critical for health promotion units on college campuses considering the use of a text system. Supportive of ample and diverse past studies (Laursen, 2012; Reimers & Stewart, 2009; Panckhurst & Moise, 2013; Cocco & Tuzzi, 2013; Potgeier, 2015), text is highly agreeable to young people as an intervention platform. Nearly every participant noted this to be an upgrade from an additional in-person session or an email system. Students are known to be resistant to receiving health information, so doing it on a platform they approve of makes sense. Further, the ever-increasing schedule load of undergraduate education that often includes several classes, jobs, and extracurricular activities, means the short burst of information from a text may be all a student has time on which to focus.
From a methodological standpoint, this system also ran particularly well. There was only one error in texts being sent during the entire semester, and a single person working on the project less than an hour a week ran the whole program. Once set up and paid for, these text systems are very low maintenance. Mobile Commons is just one of several options. Others with less backend support can be levied for similar results at lower prices. Treweek and Sullivan (2006) have noted how a lack of time and money can cause rushed intervention work. A simple text system could help alleviate both problems. Having the system in place can also make pretesting on the text platform itself possible, giving more illustrative power to the overall process.

Further, it is important to note how well-received this system was considering the sensitive topic approached. As demonstrated by the paucity of studies on sexual assault text interventions, very little was known about whether college students would accept this type of information on this platform. In effect, text could have seemed “too personal” because phones are sometimes seen as an extension of self. Luckily, this study supported the idea that anxiety from texts is actually low (Cocco & Tuzzi, 2013), and that sexual health topics are not too intimidating for students to tackle.

The interaction between students and the system backs this up. The questions asked showed a high level of engagement and interest with the topic. Students took the information seriously and wanted to ask questions that mirrored Green Dot education. Wanting to learn more about grey area consent issues was particularly relevant to students. This can help guide future practitioners in the kind of information students are seeking and how to fill in gaps that the in-person sessions might be missing. Further, asking about places in the community to gain support, like the student who wanted to know about groups who suggested waiting until marriage for sex,
shows that autonomy is still important to students regardless of which side of the issue of sex they might fall into. They are looking for community autonomy support – validation that someone in the WSU community will back up their own choices. Campus groups are another topic that could be addressed easily in future content.

Considering a major stumbling block of previous bystander activism and other sexual assault programs was a single time point of intervention (Kleinsasser et al., 2015), text messaging offers an advantage to practitioners. A text system has a chance to not only maintain, but possibly improve, attitudes, norms, and knowledge about consent and taking action to protect others. This study shows just how useful a tool widely available on mobile phones like text can be for getting information to potential audiences. The findings further buttress preexisting support for more use of communication technology in health efforts moving forward. Overall, the field needs to be strategic about its communication efforts, and text is an excellent choice.

**Sustaining Intervention Effects**

As noted previously, intervention effects tend to decrease over time, especially when targeted at young people (Hamel & Robbins, 2013). This idea seems particularly well supported by the results of this study. The control group had lower levels of each of the major outcomes by the end of the study. While a lack of statistical power and sample means it is hard to compare this across time (see limitations section), it is still highly visible when compared at each separate time point to the text groups. Both experimental groups maintained or even increased on the four outcomes throughout the semester. In effect, the initial in-person orientation may have given participants a high of information and attitudes that gradually wore off in the control group. However, in the text groups, this high was, at the very least, maintained.
This result suggests another set of implications for health practitioners interested in a text system. Not only can the system run with people liking it, there is now even more evidence that it works. One major challenge for programs like Green Dot is simply keeping the subject fresh in the minds of very busy and stressed students. With so much else going on, remembering how to identify nonconsensual situations may be difficult for students, especially in the moment. By having a short reminder each week, the content of the original intervention can be reinforced. In essence, this study suggests that text is a great supplement to an existing in-person training. From the SDT perspective, that personal connection up front may be key, but the continued efforts can certainly help with reinforcing autonomy, competence, and relatedness.

Because texting is highly personal, it can also be seen as a controlled environment (Cole-Lewis & Kershaw, 2010) where a person may feel they exert control. Indeed, this is the root of autonomy, and why it may be improved with a text intervention. A user has personal choice over who they respond to, and even which texts they read. Assuming signing up is voluntary and there are options to opt out, being part of a text intervention will feel more like an autonomous choice than the compulsory in-person programs. With options to learn more by texting back the system, people with a particular interest in the subject can feel even more autonomy through interaction. Those who are not as interested will at least be exposed to basic, core concepts without feeling like they are being overwhelmed with information.

The simplicity of text messages (Bock et al., 2012) could be a cornerstone for improving perceived competence. Messages must be direct, which promotes a clear action to be taken and could issue challenges. Further, a person would receive the most important information for increasing confidence that they could intervene. As one male focus group participant from the pretest mention: “If it can be boiled down to a text, why couldn’t anyone do it, right?” Though
this might reduce the natural element of challenge needed for competence, the larger goal of ending sexual assault on campus might be enough to provide novelty and motivation. One small step could be a precursor to helping the larger issue.

Feelings of autonomy support were also influenced by the text intervention. Being that the texts often referenced Cougs and the WSU community, this is not surprising. A text campaign to change normative beliefs about the support of others is not new (Stewart, 2014). But knowing about this support in the context of a crisis-like campus problem is important. Sexual assault prevention through bystander action holds a community of support as key. If a person knows others around them would support an action to intervene, thus having higher community relatedness, their barriers to taking the action would be reduced. A weekly text, while not as personal as the in-person sessions, could still make a person feel part of a larger movement, especially if the system is well-known on campus. One further step that could foster this feeling would be feedback about how others responded to a text, or even publicizing the program on campus in other contexts to raise awareness that the system exists and others are participating in the bystander training beyond Week of Welcome.

Considering each of the three SDT measures were successfully influenced by the text intervention, it is important for future health practitioners to consider the interplay between sexual assault prevention and text messaging. Further, the relationship of SDT to bystander intervention is made particularly clear by this piece. The messages and goal of Green Dot are well-supported by feelings of autonomy, competence, and relatedness. Improving one may well improve the other. More research can be done to understand why these two concepts mesh as well as they do.

**Autonomous Messaging**
From an SDT perspective, both messaging strategies were successful. However, this raises questions as to why H2 was rejected. If the core of SDT is choice and autonomy, why did the directive messages do just as well as the autonomous messages at fostering regulation, competence, and autonomy support? More work may need to be done to unpack this result, but it could be related to the subject matter. Simply being about a subject of interest to young people and one that well exemplifies the idea of personal choice (consent) may have been enough to sway both sets of participants. Much of the messaging focused on the idea of consent, so even by directly telling someone consent is “clear, knowing, and voluntary” may have still carried some feeling of autonomy to readers. As such, it may be important to tease apart autonomy-based wording from autonomy-based topics. Talking about certain things may naturally engage self-determination thinking.

Further, there may not have been much reactance to the messages put forth. Controlling messages tend to lead to more reactance (Miller et al., 2007), but if the directive messages of this study were still acceptable, a lack of reactance might explain the similarities in outcomes for the groups. College students appear to take this topic quite seriously and already feel motivation to act on it. As such, a directive may not be seen as a challenge to freedom, but rather, support of their previous decision. This makes even more sense considering the initial freedom threat would likely occur at the in-person trainings. A person who volunteered to receive more messaging is likely to be receptive to the task of bystander action, even if it is posed in a directive manner. The manipulation might have been more illustrative if the texts came without any prior knowledge, and thus stood as the first threat to freedom.

Despite this lack of differences in the SDT outcomes, it is important to note that anyone planning an intervention in this field would still benefit from an autonomous approach. This is
because students evaluated those messages as more likeable, less bothersome in terms of frequency, and said they were more likely to be involved in a future text program. If two strategies result in the same motivational outcomes, but one is better-liked by participants, there is still a clear choice for which should be employed in the future. Text programs should not be a pain for students because practitioners are competing with so many other screen time options and possibly other interventions.

The importance is magnified when considering reactance. Eventually, any text system based around telling people to do something will come across some hesitance and skepticism from participants. By being open in the communication style, without strong, imperative directives, there is a lower chance of high reactance. As noted by Whittingham and colleagues (2008b), poor wording or reception can lead to counterproductive results. High reactance might mean people would be less willing to intervene because they see it as an attack on their own autonomous choice. As such, while directive messages were successful here, they may be less likely to sustain over four-six years at a university. This topic needs more discussion, and could also be parsed out by gender. As the pretest focus groups revealed, women in particular may prefer the directive messages simply because they are clearer about the right and wrong of consent and assault. Women were overrepresented in the intervention sample, which may have influenced the results, but also suggests tailoring for future interventions is an opportunity. Men and women did not differ significantly in the results of this test, but a more sustained campaign could see differences.

Reactance may also be in play when considering the source of text messages. With this study, the sender was a generic number identified as the Health and Wellness unit. Having peers send this information would likely lead to less reactance. This would also support autonomy as a
peer suggestion would come across as less directive while perhaps carrying a more positive ethos. Young people trust their friends and could see them as more realistic allies when intervening. Identifying peer leaders and hubs would be an excellent next step for this research so the intervention could have other champions. Researchers are less personal – text’s major advantage is getting into a space where the personal can have profound impact in a direct and instantaneous manner.

Study Limitations and Future Solutions

One tradeoff of collecting field data, as opposed to something in a lab setting, is a high attrition rate and small, sometimes erratic, samples. The major limitation of this study was the sample size, with a particular focus on the sample of participants who actually completed all three survey evaluations (just 12). This number was so low that no comparisons across time could be made realistically. Rather, all analysis was done between groups at each time point independently. This means that some influences over outcomes, such as natural increases or decreases in knowledge or attitudes, could not be teased apart. Still, despite the sample and a nonparametric approach, significant trends emerged. Nonparametric tests with small samples usually suffer from Type 2 error (Field, 2007). Despite this, effects with decent sizes were still found. This lends some credence to the idea that natural factors were somewhat controlled by random assignment within the groups. Future evaluations of this system might be stronger if the survey evaluations were made compulsory like the in-person orientation itself, or at least included more incentivizing (everyone receives compensation rather than a drawing).

Another limitation for the study was a lack of a behavioral measure. While one can postulate that motivation would lead to bystander action, there was no way to actually measure this connection. A person highly motivated might still not act for various reasons, and trying to
measure this response would be difficult in a natural setting. Not every participant, for example, will come across an event that requires bystander action. Some might experience multiple. For this reason, it is hard to say whether the intervention will actually lead to changes on the campus community. However, this is fairly typical of communication intervention work about health. Due to privacy issues, it is rare for researchers to actually know if behavior has been influenced. A future lab experiment could see if this motivation led to action by use of confederates in a non-consent situation. But this may be too traumatic for some participants. Another consideration could be to use campus assault statistics to see if Green Dot efforts have made any change in reports of violence.

A future concern for anyone running text-based interventions may be text overload. As mentioned by the health practitioner on this study, a unit could have a text intervention for everything (sexual health, fitness, drinking, smoking, etc.), but students will likely not want to participate in that many programs. As such, it may be important to target these interventions to specific groups. One solution could be to allow students to pick and choose from a collection of message campaigns, but this might only help people already actively interested in a topic. Deciding when to use a test intervention, and how to balance that with other programs, will be vitally important for practitioners moving forward. The positives of a program could easily be undermined by people being bothered by an onslaught of impersonal texts.

Finally, the fact that there were no major differences on the SDT measures between the experimental groups may have been due to a lack of variation in the messages. Each text and its wording was crafted by topic experts with an understanding of the SDT approach, but the simple fact remains that holding a message intervention with purposefully less effective messages is counterintuitive. The directive messages in the campaign could have been a lot more forceful.
Indeed, the maligned “try again next time,” line from the directive campaign was omitted after a poor response in pretesting. Especially when working in the field, it is hard to tease apart two strategies when a practitioner still wants both to be successful. A future study could work to make the autonomy messages even more choice-oriented, or the original in-person sessions could be manipulated to set the foundation for a directive or autonomous approach more powerfully than just by text.

**Building This Field of Research**

To this point, several opportunities for future research have been presented. However, most were to address issues with design or sampling. Another important consideration is how this piece could be built upon. As a foundation, this study opens many opportunities for using text in interventions for sexual assault. Other features of text, such as the ability to hold longer discussions, or to send attachments, can be explored. For the former, having a “hotline” for texting questions about consent and how to intervene in a situation, coupled with an expert in the field, could be a valuable asset for students and mirrors other work in the sexual health and text fields (e.g. BrdsNBZ, Willoughby, 2015). The latter, or using attachments, could allow more complex messaging. Pictures, videos, and group messages are all possible. A visual guide or step-by-step video instructions on deescalating a situation could be useful. More preventative content like that found in the messages in this study could be expanded with these multimedia options as well.

Still, the text space may be limited, and this study should not be seen as only a starting point for text interventions. If anything, the efficacy of texts can act as a predictor of the success of other mobile options. College students are particularly fond of apps, which have several other options to be explored. Push notifications from the apps could take place of text messages, while
app functionality can expand many of the concepts of SDT. For example, an app that allows people to map out Green Dots on campus in real time, or even call for help with an urgent Red Dot, would make the community relatedness extremely relevant. Apps also offer more chance for customization. Students interested in certain types of intervention content can tailor their experience. This may be an excellent way to deal with text intervention overload. One central app for a health promotion unit could offer interventions for anything from sexual assault and bystander intervention content to students who want to quit smoking, or stress management.

Other communication technologies, like social media, can be used to further an SDT bystander intervention for sexual assault as well. Instagram and Snapchat, popular photo sharing services, may reach audiences in a novel way and allow for more peer interactions on the subject. Simply having a presence on campus social media sites might also allow for people to feel community relatedness and support. Goals and notifications about Green Dot successes could also be used to build competence, with all the content geared toward autonomous choice. In short, the concepts of this study can flourish on other platforms, with one caveat: a continued adherence to strong, theory-driven and pretested messages.

**Conclusion**

This study evaluated the feasibility and effects of a text-based sexual assault bystander intervention program. Using the principles of SDT as guides for motivation, the results suggest that texts do well to sustain information and attitudes begotten from an in-person intervention. People who received texts felt more autonomous regulation in their choice to intervene, more competence to actually step in, and more relatedness to the WSU community in supporting them to take action. Further, their knowledge of what consent entails was also higher than those who did not receive texts. Two types of texts were tested in the study, with one being focused on
autonomy-supportive messaging, while the other had more directives. Although there was no difference in these approaches on the SDT or knowledge outcomes, students in the autonomy group did rate their content as more likeable, were less bothered by high message frequency, and had higher intent to sign up for similar interventions.

The suitability of text as an intervention tool is likely beyond a need for defense. However, this piece continued to build that strong argument of a relevant platform, while also pushing the field further by including strong theoretical foundations for the messaging content and outcomes included. So often text interventions are still stuck in the “can they work” paradigm that best practices are ignored for the sake of novelty. Text has, hopefully, moved beyond this need for pure feasibility studies and is now open to stricter tests of effects and theoretically-driven interventions.

Further, this piece explored an area of intervention work that needs continuous support. The problem of sexual assault on college campuses needs workable answers. A climate of support and normative change toward bystander behavior will be needed to protect people and their sexual autonomy. As SDT shows, making this choice feel autonomous will be important in motivating students to act. While this study showed even a directive campaign might improve motivation, one with autonomous messaging is still appreciated more by students. Ultimately, jumping the hurdle of student attention may need to be the focus of all college health campaigns moving forward.
REFERENCES


http://dx.doi.org/10.1037/vio0000055


Moore, S., Crompton, K., van Goozen, S., van den Bree, M., Bunney, J., & Lydall, E. (2013) A feasibility study of short message service text messaging as a surveillance tool for alcohol...

Retrieved from: http://www.biomedcentral.com/1471-2458/13/1011


Puente, R. & Anshel, M. (2010) Exercisers’ perceptions of their instructor’s interacting style, 
perceived competence, and autonomy as a function of self-determined regulation to 
exercise, enjoyment, affect, and exercise frequency. Scandinavian Journal of Psychology, 
51(1), 38-45. doi: 10.1111/j.1467-9450.2009.00723

Modeled as a Combination of Anger and Negative Cognitions. Communication Research, 


RAINN. About the National Sexual Assault Hotline. RAINN Online Network. Retrieved from: 
https://www.rainn.org/about-national-sexual-assault-online-hotline

Ranney, M., Choo, E., Cunningham, R., Spirito, A., Thorsen, M., Mello, M., & Morrow, K. 
Interventions for High-Risk Adolescent Females: A Qualitative Study. Journal of 

Regan, A., Blyth, C., Tracey, I., Mak, D., Richmond, P., & Effler, P. (2015). Comparison of text- 
messaging to voice telephone interviews for active surveillance of adverse events 
following immunization. Vaccine, 33, 3689-3694. doi: 10.1016/j.vaccine.2015.06.022

the behavioral sciences. Behavior Research Methods, 41(3), 675-681. doi: 
10.3758/BRM.41.3.675

perspectives. In R. Erber & R. Gilmour (Eds.), Theoretical frameworks for personal 
relationships (pp. 87–110). Hillsdale, NJ: Erlbaum


## APPENDICES

### Appendix A: Tables

Table 1: Messaging and Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Message</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pretest Survey</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Consent is making sure the other person is as into what’s happening as you. It's clear, knowing, and voluntary. Want more? [LINK]</td>
<td>Auto</td>
</tr>
<tr>
<td></td>
<td>Consent is making sure the other person is as into what’s happening as you. It’s clear, knowing, and voluntary. Learn more here [LINK]</td>
<td>Dir</td>
</tr>
<tr>
<td>2</td>
<td>Senior WSU students often say they wish they would have talked more about the process of consent. What questions do you have?</td>
<td>Auto</td>
</tr>
<tr>
<td></td>
<td>Senior WSU students often say they wish they would have talked more about the process of consent. Watch future texts for info they wanted sooner.</td>
<td>Dir</td>
</tr>
<tr>
<td>3</td>
<td>Words, gestures, or touches without consent are sexual assault. Understanding consent can help us have healthier relationships.</td>
<td>Auto</td>
</tr>
<tr>
<td></td>
<td>Words, gestures, or touches without consent are sexual assault. You need to understand consent to have healthy relationships.</td>
<td>Dir</td>
</tr>
<tr>
<td>4</td>
<td>Going out this weekend? People find it helpful to think ahead about how they might intervene in a possible risky situation. For tips: [LINK]</td>
<td>Auto</td>
</tr>
<tr>
<td></td>
<td>Going out this weekend? Plan ahead for how you can intervene in a possible risky situation. Get tips here: [LINK]</td>
<td>Dir</td>
</tr>
<tr>
<td>5</td>
<td>How might you benefit from practicing the consent process in situations other than sex? Want to see how it translates to your life? [LINK]</td>
<td>Auto</td>
</tr>
<tr>
<td></td>
<td>Getting consent is a process we can all learn. This concept translates to a lot of other social interactions. Learn more here: [LINK]</td>
<td>Dir</td>
</tr>
<tr>
<td>6</td>
<td>It’s okay if ending sexual assault isn’t your top priority every day. We do what we can. Would you like to learn easy ways you can help? Text us YES</td>
<td>Auto</td>
</tr>
<tr>
<td></td>
<td>We can all help end sexual violence in simple ways every day. Text us YES now to learn more.</td>
<td>Dir</td>
</tr>
<tr>
<td>7</td>
<td>Midtest Survey</td>
<td>All</td>
</tr>
<tr>
<td>8</td>
<td>If you wouldn't give them the keys to your car, will they be capable of giving consent? Want to learn about alcohol and consent: [LINK]</td>
<td>Auto</td>
</tr>
<tr>
<td></td>
<td>If you wouldn't give them the keys to your car, they may not be capable of giving consent. Learn about alcohol and consent: [LINK]</td>
<td>Dir</td>
</tr>
<tr>
<td>9</td>
<td>Have you ever wanted to speak up or intervene in an unfair or unsafe situation, but didn't? It's okay. We all get chances to try again.</td>
<td>Auto</td>
</tr>
<tr>
<td></td>
<td>Have you ever wanted to speak up or intervene in an unfair or unsafe situation, but didn’t? We all get chances to try again.</td>
<td>Dir</td>
</tr>
<tr>
<td>10</td>
<td>Students can be key to ending sexual assault because you’re often the first to see it. Thank you for the big and small ways you help us all be safe. Go Cougs!</td>
<td>Auto</td>
</tr>
<tr>
<td></td>
<td>Students are often the first to see sexual assault happening. Thank you, for helping us all be safe. Go Cougs!</td>
<td>Dir</td>
</tr>
<tr>
<td></td>
<td>Question</td>
<td>Response</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>11</td>
<td>Do you think repeatedly asking for or pressuring someone to have sex is sexual assault? Text us YES or NO</td>
<td>Auto</td>
</tr>
<tr>
<td></td>
<td>Repeatedly asking for or pressuring someone to have sex can be sexual assault. Learn more at: [LINK]</td>
<td>Dir</td>
</tr>
<tr>
<td>12</td>
<td>Most sexual assailants are someone the victim knows and trusts. How do you think this affects our ability to intervene? [LINK]</td>
<td>Auto</td>
</tr>
<tr>
<td></td>
<td>Most sexual assailants are someone the victim knows and trusts. Knowing this will help you know when to intervene. [LINK]</td>
<td>Dir</td>
</tr>
<tr>
<td>13</td>
<td>What might stop you from intervening in a possible sexual assault? A)Embarrassment   B)Not knowing when to act C)Not knowing how text A,B, or C to let us know.</td>
<td>Auto</td>
</tr>
<tr>
<td></td>
<td>Embarrassment or not knowing how to act can stop someone from intervening in a possible sexual assault. To overcome these barriers: [LINK]</td>
<td>Dir</td>
</tr>
<tr>
<td>14</td>
<td>Posttest Survey</td>
<td>All</td>
</tr>
</tbody>
</table>
Table 2: Message Pretesting Measures

Message-Level (Repeated for Each Message Tested) *

<table>
<thead>
<tr>
<th>Measure</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>I could understand the message.</td>
<td>1</td>
</tr>
<tr>
<td>The message was relevant to me.</td>
<td>2</td>
</tr>
<tr>
<td>The message was believable.</td>
<td>3</td>
</tr>
<tr>
<td>The message encouraged me to think independently.</td>
<td>4</td>
</tr>
</tbody>
</table>

Autonomy Scale *

<table>
<thead>
<tr>
<th>Measure</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>These messages provided me choice and options.</td>
<td>5</td>
</tr>
<tr>
<td>These messages gave me direct commands to act a certain way. (Reverse Coded)</td>
<td>6</td>
</tr>
<tr>
<td>These messages conveyed confidence in my ability to make changes.</td>
<td>7</td>
</tr>
<tr>
<td>These messages encouraged me to ask questions.</td>
<td>1</td>
</tr>
<tr>
<td>I don’t feel very good about the way these messages made me feel (Reverse Coded)</td>
<td>2</td>
</tr>
<tr>
<td>The sender of these messages was open to my opinion.</td>
<td>3</td>
</tr>
</tbody>
</table>

Acceptability Scale *

<table>
<thead>
<tr>
<th>Measure</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>I liked the messages.</td>
<td>1</td>
</tr>
<tr>
<td>These messages kept my attention.</td>
<td>2</td>
</tr>
<tr>
<td>I read all the information provided in the messages.</td>
<td>3</td>
</tr>
<tr>
<td>The information in the messages fit my needs.</td>
<td>4</td>
</tr>
<tr>
<td>The information in the messages was designed for people like me.</td>
<td>5</td>
</tr>
<tr>
<td>The messages were easy to read and understand.</td>
<td>6</td>
</tr>
<tr>
<td>I would sign up for messages like these.</td>
<td>7</td>
</tr>
<tr>
<td>I would recommend these messages to a friend.</td>
<td>1</td>
</tr>
</tbody>
</table>

Open-Ended Response

What do you think about the idea of sending health and wellbeing information to students via text messages? Please explain.

*All statements rated on 7-point likert scale from strongly disagree (1) to strongly agree (7)
Table 3: Message Pretesting Descriptive Statistics

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Autonomy Group</th>
<th>Directive Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understandable</td>
<td>6.46 (0.61)</td>
<td>5.98 (1.24)</td>
</tr>
<tr>
<td>Relevant</td>
<td>6.22 (0.57)</td>
<td>5.38 (1.18)</td>
</tr>
<tr>
<td>Believable</td>
<td>6.10 (0.66)</td>
<td>5.25 (1.20)</td>
</tr>
<tr>
<td>Independent</td>
<td>5.80 (0.73)</td>
<td>5.07 (1.20)</td>
</tr>
<tr>
<td>Autonomy Scale</td>
<td>5.72 (0.82)</td>
<td>5.07 (1.05)</td>
</tr>
<tr>
<td>Acceptability Scale</td>
<td>5.44 (0.95)</td>
<td>4.69 (1.25)</td>
</tr>
</tbody>
</table>
Table 4: Intervention Measures

**Autonomy Regulation Scale**
- I feel that I want to take responsibility for making the people in my community safer.
- I personally believe intervention is the best things for the people in my community.
- I have carefully thought about it and believe it is very important to me.
- Intervention is an important choice I really want to make.
- Intervention is consistent with my life goals.
- Intervention is very important for making the people in my community as safe as possible.

**Competence Scale**
- I feel confident in my ability to take action to reduce interpersonal violence.
- I feel capable of taking action to reduce interpersonal violence.
- I am able to take action to reduce interpersonal violence.
- I am able to meet the challenge of taking action to reduce interpersonal violence.

**Autonomy Support Scale**
- I feel the WSU campus community has provided me with options about taking action to reduce interpersonal violence.
- I feel the WSU campus community understands how I see things with respect to reducing interpersonal violence.
- The WSU campus community conveys confidence in my ability to take action to make changes regarding interpersonal violence.
- The WSU campus community listens to how I would do things to reduce interpersonal violence.
- The WSU campus community encourages me to ask questions about reducing interpersonal violence.
- The WSU campus community tries to understand how I see interpersonal violence before suggesting any changes.

**Consent Understanding Scale**
- I feel that sexual consent should always be obtained before that start of any sexual behaviors.
- I believe that asking for sexual consent is in my best interest.
- I think obtaining consent is important regardless of whether or not you have had sex with the person before.
- I believe you should always assume you do not have consent before initiating sexual activities.
- I believe it is just as important to obtain consent for genital fondling as it is for intercourse.
- Most people I care about feel that asking for sexual consent is something I should do.
- Consent should be asked before any sexual behavior, including kissing or dirty talk.
- I think it is responsible for both or all partners involved to make sure sexual consent is established prior to sexual activity.

**Content Liking Scale**
- The content kept me engaged.
- The messages received were interesting.
- I talked about the messages with my friends.
- The messages were relevant to college students.
I often wanted to respond to the messages.
I often wanted to ask questions.

Platform Preference Scale
I liked getting this content on my mobile phone.
I preferred receiving these messages on my phone to an alternative such as email.
Getting this content on my phone was a bother. (Reverse Coded)
Using this text service was better than attending an additional in-person workshop.

System Interactivity Scale
I felt the messages were designed just for me.
I felt the messages allowed me to ask questions.
The system seemed highly interactive.
I had control over the information I could get from this service.
I would sign up for something like this in the future.

*All statements rated on 7-point likert scale from strongly disagree (1) to strongly agree (7)
<table>
<thead>
<tr>
<th>Outcome</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content Liking</td>
<td>145</td>
<td>4.89</td>
<td>1.10</td>
<td>1 (low liking) – 7 (high liking)</td>
</tr>
<tr>
<td>Platform Preference</td>
<td>145</td>
<td>5.27</td>
<td>.91</td>
<td>1 (does not prefer mobile) – 7 (prefers mobile)</td>
</tr>
<tr>
<td>System Interactivity</td>
<td>144</td>
<td>4.73</td>
<td>1.13</td>
<td>1 (not interactive) – 7 (highly interactive)</td>
</tr>
<tr>
<td>Message Frequency</td>
<td>145</td>
<td>2.99</td>
<td>.464</td>
<td>1 (too often) – 5 (not often enough)</td>
</tr>
<tr>
<td>Future Intent</td>
<td>144</td>
<td>5.26</td>
<td>1.44</td>
<td>1 (not likely to participate again) – 7 (very likely)</td>
</tr>
</tbody>
</table>
Appendix B: Figures

Figure 1: Scores on Autonomous Choice Regulation by Group

![Graph showing scores on autonomous choice regulation by group over pretest, midtest, and posttest. The graph compares three groups: Control, Directive, and Autonomy.](image-url)
Figure 2: Scores on Competence to Intervene by Group
Figure 3: Scores on Community Relatedness by Group
Figure 4: Scores on Consent Understanding by Group