DECISIONS, DECISIONS: DEVELOPING INTERACTIVE FICTION FOR HEALTH COMMUNICATION

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B.S., University of Pittsburgh, 2007

Submitted to the Graduate Faculty of

Graduate School of Public Health in partial fulfillment

of the requirements for the degree of

Master of Public Health

University of Pittsburgh

2011

UNIVERSITY OF PITTSBURGH

Graduate School of Public Health

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March 30, 2011

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Young female undergraduate students frequently engage in sexual activity, often without using condoms. Such risky behavior poses serious physical health risks to these women, their current and future partners, and possibly their children. Consequences of unsafe sex like STIs and unplanned pregnancy can further have serious financial and psychological implications. Health communication campaigns that impart sexual health information and improve attitudes toward safer sex offer a promising means of addressing these serious public health issues. A strategic health communication effort will comprise solid theoretical bases, carefully designed program plans, and ample community involvement to create effective and appealing messages and materials.

The *Adventures in…* project began when four graduate students created a small, vibrant interactive fiction story booklet as a novel means of sexual health outreach for female undergraduates. Initially part of the final assignment for a Health Communication class, the booklet interested several stakeholders at the University of Pittsburgh who gave the graduate students (the project team) opportunity to adapt the item and circulate it in the undergraduate population. Since adapting the booklet to fit cultural, institutional, and other considerations, the *Adventures in...* project has distributed copies of the item at several student events and received positive initial feedback from members of the target audience. Several challenges arose through the course of the project that delayed its development and limited its outreach, some of which

may have been prevented through more careful planning. However, the project team has continued to adapt the message and material to serve the needs of the target population.

Interactive fiction as health pedagogy appears to have strong theoretical premise and promise as a form of health communication. This project has public health significance because entertaining communication efforts that promote sexual health are necessary to address young adults' unsafe sex practices. The *Adventures in…* project consequently must continue its development and outreach efforts. Foremost, it should create more stories on other relevant health topics, expand its reach to other segments of the student population and to other college campuses, and adopt the increasingly popular and accessible online format.

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PREFACE

Foremost, I wish to thank my thesis committee for their insight, guidance, and support throughout this process, especially Dr. Martha Ann Terry. Her unwavering willingness to meet, discuss, and encourage is truly appreciated.

I also thank my classmates Meghan Talmadge, Anna Vitriol, and Molly Ferguson, with whom I collaborated to write and create the original story booklet that started the *Adventures in…* project. Anna and Molly further played vital roles in the booklet's introduction, adaptation, and circulation at the University of Pittsburgh. They were excellent project partners.

This project's transition from a class assignment to a health communication effort likewise would not have occurred without the assistance of Dr. Jaime Sidani and Rob Wilson. Dr. Sidani and the 2009-2010 and 2010-2011 PantherWELL peer health educators further gave invaluable feedback to make the booklet more appealing and relevant to undergraduate students and their health needs.

Several Graduate School of Public Health faculty have also offered support to this project: Dr. Kenneth Jaros and Dr. Christine Ley, Directors of the Center for Maternal and Child Health Leadership in Public Health Social Work, who permitted several project development activities to be considered part of the Center's efforts toward MCH promotion; Dr. Jeannette Trauth, Dr. Elizabeth Madison Felter, and Ms. Tammy Thomas, whose invitations to present this

project to their classes resulted in my establishing several professional contacts; Dr. Terry, Elizabeth, and Tammy have also provided support on other matters of project development, for which I am very grateful.

My heartfelt thanks also goes out to my friends and colleagues within Public Health, Social Work, and other fields who likewise believed in this project and in me, especially my fellow students in the Public Health Social Work program.

Finally, I thank from the bottom of my heart my parents, Lou and Carmela Londino, without whom I would not be here, figuratively and literally.

1.0 INTRODUCTION

For most undergraduate students, college is a time of self-discovery as they pursue their education and enjoy new freedom as young adults. Numerous studies find, however, that many of these young adults engage in risky sexual behaviors and experience significant rates of sexually transmitted infections (STIs), unplanned pregnancy, and unwanted sexual contact. The outcomes of unsafe sex can have numerous physical, emotional, and financial consequences for this population that ultimately result in great societal cost. Female undergraduate students are particularly vulnerable to unsafe sex and tend to suffer more serious morbidity than their male counterparts.

To educate and empower young female undergraduate students to make healthy sex decisions, four graduate students created a small, colorful story booklet that used interactive fiction as a novel means of outreach. Interactive fiction allows the reader to affect the development of the storyline through choosing the main character's decisions and actions. The narrative began with an undergraduate female student leaving a party with a young man for whom she has romantic feelings. This young woman (the main character) then faces several sexual health decisions throughout the story, which the reader can choose to see what health consequences will ensue. Targeted to the students at University of Pittsburgh-Main Campus, the narrative contained story details and scenarios specific to that population. The booklet also listed local sexual health resources.

Initially a part of the final assignment for a Health Communication class at University of Pittsburgh Graduate School of Public Health, this booklet gained the interest of several stakeholders at the University of Pittsburgh who gave the graduate students (the project team) an opportunity to adapt and distribute the item to the undergraduate population. The booklet underwent numerous changes to its storyline, features, and title. Its new title, *Adventures in…SEX*, is the basis of *Adventures in…*, the name of this project. Since adapting the booklet to fit cultural, institutional, and other considerations, the *Adventures in…* project has circulated booklets at several student events, received initial positive feedback from members of the target audience, and continues to seek means of project development. Although several challenges have arisen, the use of interactive fiction as health pedagogy appears to have strong theoretical premise and promise as a form of communication.

Conducting a sexual health communication effort requires a strong understanding of the problem, its context, and its consequences, as well as the application of best practices in health communication design and program planning. This thesis will present several theories and best practices of health communication design and planning, and then utilize them to analyze the case study of the *Adventures in…* project. Besides determining successful applications of theory and areas in need of improvement, the author (who now holds full control of the *Adventures in…* project) will offer recommendations for continued project development based upon the literature. Chapter 2 of this thesis will cover in-depth the extent and diverse consequences of unsafe sexual practices in the undergraduate student population, as well as the social, cultural, and political factors that promote such risky behaviors. Chapter 3 will present relevant theories and best practices of health communication design, planning, and implementation in the context of the phases of the PRECEDE-PROCEED planning model. The chapter will also briefly touch upon

the project team's actions that aligned with each of these phases. Chapter 4 will then more fully describe the development of the *Adventures in*… project from its beginning as a graduate class assignment to its introduction at the University of Pittsburgh-Main Campus, to its current efforts for continued project development and outreach. Chapter 5 will then explain how best practices were successfully applied to the design of the health communication materials and efforts, and identify areas in need of improvement to facilitate the project's progression. Chapter 6 will conclude this thesis, discuss the limitations of the current project, offer recommendations for future development, and then reiterate the necessity of such interventions.

2.0 LITERATURE REVIEW

2.1 UNDERGRADUATE SEXUALITY: ITS CULTURE AND CONSEQUENCES

The typical transition from high school to college often results in greater freedom for young people and more opportunities to find sex partners and experiment with various behaviors (Lindgren, Schact, Pantalone, & Blayney, 2009). Evidence from the Spring 2010 American College Health Association National College Health Assessment (ACHA-NCHA II), which examined the health status of 95,712 students attending 139 academic institutions, found that 70.8% of college students had engaged in some form of sexual activity in the past 12 months. This study also found that in the past 30 days, 45.1% and 49.8% had experienced oral sex and vaginal intercourse respectively, but only 5.0% and 51.0% reported consistent condom use for these respective behaviors. Other studies show similar prevalence of risky sexual behavior in undergraduate students. Scholly, Katz, Gasciogne, & Holck (2005) surveyed students at six different college campuses and found that, among participants sexually active in the past 30 days, less than 40% reported consistent condom use and over 35% reported no condom use in that time frame.

Studies further show that female students are more likely than male students to engage in risky sexual behaviors. Bontempi, Mugno, Bulmer, Danvers, & Vancour (2009) found that female college students had lower rates of frequent condom use and any condom use than their

male counterparts. The ACHA-NCHA II conducted by the American College Health Association (2010) reports similar trends. Although higher percentages of female students reported engaging in oral sex and vaginal intercourse in the past 30 days compared to the general and male student populations, lower percentages of female students reported condom use during either activity compared to the general and male student populations (see Figures 1 and 2 in Appendix A). Such prevalence of unsafe sexual activity within the general and female student population indicates a serious risk to these individuals and their current and future partners for sexually transmitted infections (STIs), unplanned pregnancy, and emotional consequences like regret and anxiety.

2.1.1 Influences on Undergraduates' Unsafe Sexual Activity

Until President Obama signed an appropriations bill in December 2009 that created the Office of Adolescent Health's teenage pregnancy prevention initiative (Krisberg, 2010), the federal government reserved funding for Abstinence-only sex education (AOSE) curricula with the "exclusive purpose [of] teaching the social, psychological, and health gains [of] abstaining from sexual behavior" (Rosenbaum, 2009, p. 2). Under these programs, health teachers could discuss contraceptive measures only in terms of their failure rates and had to describe sexuality as only appropriate when within the confines of heterosexual marriage (Krisberg, 2010). Failure to adhere to these guidelines could result in serious consequences such as reassignment and termination. For example, in Florida school administrators suspended and then fired a teacher who used a banana to demonstrate to his students how to properly put on a condom, while a teacher in Tennessee was retrained and reassigned after a 30-year career due to her (supposedly critical) comments about an abstinence video (Riscol, 2004). A 2004 review found that 11 of 13 of these programs contained incorrect information on the effectiveness of birth control and

condoms (Rosenbaum, 2009) and no AOSE program has shown evidence of altering adolescent sexual behavior (Advocates for Youth, 2009).

Rosenbaum (2009) found that of adolescents who took formal "virginity pledges" (a public promise made either verbally or in writing to delay sexual activity), 81.9% did not remember making these pledges five years later. Sexually active unmarried "pledgers" were also less likely to report contraceptive use in the past year (Rosenbaum, 2009). Other studies that compare students who made virginity pledges to those who did not likewise find that "pledgers" are less likely to be prepared for contraceptive use when having sex (Bearman & Brückner, 2001), and seek STI testing and treatment less often than "nonpledgers," despite having equal rates of STIs (Brückner & Bearman, 2005). Only personal pledges made to oneself appear effective at delaying sexual activity, indicating the impact of personal values over abstinence-focused programs (Bersamin, Walker, Waiters, Fisher, & Grube, 2005). By contrast, evidence indicates that condom promotion campaigns do not result in higher adolescent sexual activity (Perloff, 2001), and sex education curricula that includes comprehensive, scientifically-accurate information on STIs and contraception actually have demonstrated delaying adolescent sexual initiation, reducing rates of STIs, and increasing use of condoms and birth control (Advocates for Youth, 2009).

The young adult and college student cultures foster practices that compromise sexual health and wellness. Young adults' monogamous relationships can be quite short-lived: a study by Critelli and Suire (1998) found that 46% of college students who reported belonging to a monogamous relationship in the past year had more than one partner in the same time period. Participants who reported a monogamous relationship also had an average of 2.3 sexual partners the past year. The researchers actually defined a monogamous relationship as exclusive sexual

intimacy lasting longer than one month, based on pilot study information that indicated one month as the time frame that distinguished exclusive relationships from casual ones. Because of such short relationship duration, college students can accumulate a number of sexual partners (Bolton, McKay, & Schneider, 2010). Corbin and Fromme (2002) studied a college student population with a mean age of about 19 years and found that 33% of the participants reported having five or more sexual partners and 13% reported having 10 or more. The American College Health Association (2010) found similar results: as shown in Figure 3 (see Appendix A), although the majority of college students had only had one or no sexual partners in the past 12 months, over 25% of surveyed students had multiple partners in the last year.

This trend of college students with multiple sex partners likely arises from the growing acceptance of casual sex; that is, sex with someone recognized as not a committed partner. Multiple terms apply to this action, including “friends with benefits” (Eisenberg, Ackard, Resnick, & Neumark-Sztainer, 2009), “hookup” (Eisenberg et al., 2009; Fielder & Carey, 2010), or “hooking up” (Downing-Matibag & Geisinger, 2009). Numerous young people engage in casual sex, with a study finding that 78% of undergraduate participants reported sexual activity with someone considered an acquaintance or stranger (Eisenberg et al., 2009). Casual sex has great appeal for many students because it offers them a way to fulfill their sexual desires without the time and monetary investment of traditional dating. Students who forego committed relationships for casual encounters do so at the expense of their health, as they frequently do not practice safer sex under these circumstances (Downing-Matibag & Geisinger, 2009).

While a variety of factors inhibit condom use during casual sex (such as embarrassment and low perceived risk of contracting an STI), alcohol use plays a major role in this risky behavior (Downing-Matibag & Geisinger, 2009). As noted by Menegatos, Lederman, and Hess

(2010), “alcohol fuels the so-called ‘hookup culture’” (p. 375), a statement supported by Fielder and Carey’s 2010 study that found alcohol inebriation levels significantly predicted both oral sex and vaginal intercourse “hookups.” Heavy drinkers tend to have more sexual partners and use condoms less frequently (Corbin & Fromme, 2002), possibly because those who abuse alcohol may experience reduced inhibitions, feel more comfortable approaching people for such encounters, and perceive greater pressure to engage in casual sex (Fielder & Carey, 2010). Evidence further suggests that students may drink to the point of inebriation if they anticipate favorable outcomes, despite awareness of possible sexual consequences. Students may even blame their poor sexual decisions on intoxication rather than accept personal responsibility for such actions (Lindgren, Pantalone, Lewis, & George, 2009; Novik, Howard, & Boekeloo, 2010). This risky blend of alcohol and sexual activity may be exacerbated by the prevalent viewpoint within the undergraduate student population that alcohol acts as a “social lubricant” to advance interpersonal relations and that heavy drinking is an inherent part of college life (Menegatos, Lederman, & Hess, 2010).

Pervasive sexual content within mainstream mass media also promotes risky behaviors. Music, movies, television, and magazines typically portray sex as enjoyable without any risk: a 2002 study found that of 20 television shows popular in the adolescent population, approximately one out of eight showed sexual responsibility and/or risks though 83% contained sexual content (Brown, L’Engle, Pardun, Guo, Kenneavy & Jackson, 2006). A study by Kim, Sorsoli, Collins, Zylbergold, Schooler, & Tolman (2007) also found that many television programs commonly viewed by adolescents characterized masculinity as strongly tied to overt displays of heterosexuality, encouraged females to objectify themselves and have their physical appearance supersede their other attributes, and emphasized that men seek sexual fulfillment

while women need to be in relationships. More recent media like video games also tend to objectify women and emphasize their physical appearance (Behm-Morawitz & Mastro, 2009), and the plots of many adult-oriented video games entail convincing women to engage in highly sexual activities (Yao, Mahood, & Linz, 2010). Of popular teen media, though, music shows the greatest prevalence of sexual content, often with lyrics that degrade women (Martino, Collins, Elliott, Strachman, Kanouse, & Berry, 2006).

Because mass media serve as a major provider of sex information to the adolescent population (Brown et al., 2006), such pervasive sex content has serious implications for adolescent and young adult health. Marino et al. (2006) studied a population of teenagers aged 12 to 17 for several years and found that their likelihood to progress in noncoital sexual activities and to initiate sexual intercourse was positively associated with the amount of degrading sexual content they heard through music. Exposure to greater levels of sexual content in media (a term in this instance encompassing music, magazines, television, and movies) by young adolescents was linked to engaging in sexual intercourse earlier than those with less exposure (Brown et al., 2006). Further, male and female undergraduate students who played video games depicting sexualized female characters showed less favorable attitudes about women's cognitive abilities (Behm-Morawitz & Mastro, 2009). Women, who now comprise 40% of U.S. game players, showed decreased levels of self-efficacy; that is, confidence in themselves (Behm-Morawitz & Mastro, 2009). Playing video games with strong sexual content has also been shown to increase young men's perceived likelihood to engage in inappropriate sexual advances (Yao, Mahood, & Linz, 2010).

2.1.2 Physical Health Implications of Unsafe Sex

Unsafe sex puts young adults at serious risk of acquiring disease. People between 25 and 34 years old make up 28% of new HIV/AIDS cases, which suggests that many became infected through unprotected heterosexual sex during college (Gullette & Lyons, 2006). A retrovirus that causes the eventual destruction of the immune system, Human Immunodeficiency Virus (HIV) can be treated with medications that impair viral replication (Heffner & Schust, 2010). However, this disease currently has no cure, and can progress to the usually-fatal condition Acquired Immunodeficiency Syndrome (AIDS). People with AIDS can develop a number of opportunistic infections, such as pneumonia, meningitis, and Kaposi's Sarcoma (Jones & Lopez, 2006). Other viral STIs such as Herpes Simplex Virus (HSV) and Human Papillomavirus (HPV) likewise have no cure (Heffner & Schust, 2010; Centers for Disease Control and Prevention [CDC], 2009b), and both viral and bacterial STIs can result in serious health consequences (Royer & Zahner, 2009).

These STIs pose a serious public health risk to the young adult population. People between the ages of 15 and 24 years have the highest rates of STIs compared to all other age groups, and they account for approximately half of all new STI cases (Royer & Zahner, 2009). It is estimated that one out of every two sexually active youth will contract an STI before the age of 25 (Brown et al., 2006). Genital herpes, an STI caused by the Herpes Simplex Virus (HSV) that can result in genital sores, fever, and headaches (Jones & Lopez, 2006), shows rising rates in adolescents and has peak prevalence within the 20 to 29 year old age group (Roberts, 2005). Syphilis, an STI caused by bacteria, is similarly prevalent in young people. In 2009, U.S. men and women ages 20 to 24 years old had the highest rates of syphilis, with 20.7 and 5.6 cases per 100,000 people, respectively. The rate for the female 15 to 19 year old age group was similar, 3.3

per 100,000, and was the third highest rate of all age groups of U.S. women (CDC, 2010). Although curable, if untreated syphilis can cause lesions, rash, fever and, if it progresses to its final stage, damage to the central nervous system and internal organs, and possibly death (Jones & Lopez, 2006).

The two most commonly reported STIs in the United States are Chlamydia trachomatis (chlamydia) and Neisseria gonorrhea (gonorrhea), and young women ages 15 to 19 years and 20 to 24 years have the highest rates of both diseases compared to any other age group (CDC, 2010). In women, both chlamydia and gonorrhea can produce vaginal discharge, cause infection of the cervix, urethra, and fallopian tubes, and result in pelvic inflammatory disease (PID) (Heffner & Schust, 2010). Some effects of PID include chronic pelvic pain, ectopic pregnancy, and infertility, and most cases result from STIs like chlamydia and gonorrhea (Yeh, Hook, & Goldie, 2003). Having these diseases while pregnant can also pose a risk to the newborn. Gonorrheal infection acquired in the birth canal can develop into neonatal gonococcal ophthalmia, which if untreated can cause blindness. Exposure to chlamydia in the birth canal can result in afebrile pneumonia or conjunctivitis, which can also produce blindness (Heffner & Schust, 2010).

Unplanned pregnancy itself presents health risks, apart from the presence of STIs. Approximately half of all U.S. pregnancies are unplanned (Cheng, Schwartz, Douglas, & Horon, 2009), and almost half of all unplanned pregnancies are terminated in elective abortion (Jones & Lopez, 2006). Both surgical abortion (performed in-clinic) and medication abortion (induced with the drugs mifespristone and misoprostol) are usually very safe. However, as medical procedures they involve potential risks. Possible complications of surgical abortion include incomplete abortion, uterine blood clots, cervical damage, and heavy bleeding, all of which can

worsen with pregnancy duration and the use of anesthesia. Medication abortion carries risks such as allergic reaction to the medication, incomplete abortion, infection, and heavy bleeding. In very rare instances, complications from either procedure could result in death (Planned Parenthood Federation of America, 2011).

However, depending on the pregnancy duration, abortion usually carries equal or less risk of maternal death than childbirth (Planned Parenthood Federation of America, 2011). The risks involved with carrying a pregnancy to term include toxemia, gestational diabetes mellitus, ectopic pregnancy, and hemorrhage (Jones & Lopez, 2006). Children conceived unexpectedly can likewise face serious risks. In the time before they realize they are pregnant, women with unintended pregnancies may engage in activities harmful to fetal health, such as binge drinking and smoking (Dott, Rasmussen, Hogue, & Reefhuis, 2010). In a study of over 9,000 postpartum women, Cheng et al. (2009) found that women with unplanned pregnancies (the mother had wanted to be pregnant later) and with unwanted pregnancies had higher rates of smoking in the third trimester compared to women with intended pregnancies. Both subsets of women were also more likely to smoke following their pregnancy, delay their prenatal care, and were less likely to consume folic acid (important for preventing defects in fetal neural tubes) prior to and early in their pregnancy. Dott et al. (2010) found similar results: more women with unintended pregnancies smoked and used drugs during their pregnancy and had lower rates of folic acid consumption than women who had planned their pregnancies.

2.1.3 Mental Health Implications of Unsafe Sex

Unsafe sex practices also present numerous potential financial and psychological burdens. Abortions can be costly procedures such that the price may deter some women from getting them

(Jones & Lopez, 2006), and having a child can seriously strain a woman's resources (Eshbaugh & Gute, 2008). STIs can be similarly costly: estimates of the annual cost of these diseases range from $9.3 billion to $15.5 billion (Royer & Zahner, 2009). Yeh, Hook, and Goldie (2003) estimate that the lifetime cost of PID for one woman ranges from $1,060 to $3,180, with an average cost of $2,150. They base these estimates on direct costs such as diagnostic procedures, prescriptions, and surgeries. The stigma associated with STIs can exacerbate their costliness. For example, college students covered by their parents' health insurance plans often choose to pay for HSV diagnostic procedures and medicine themselves rather than risk exposure by insurance documents (Roberts, 2005).

An STI diagnosis in young adults can indeed result in embarrassment (Royer & Zahner, 2009) as well as in depression, emotional distress, and relationship issues (Roberts, 2005). In a study of over 4,000 adolescents by Shrier, Harris, and Beardslee (2002), STI diagnosis had a strong association with an increase in depressive symptoms. Depression may also arise from unplanned pregnancies. Women with unplanned and unwanted pregnancies showed higher rates of developing postpartum depression compared to women with intended pregnancies; women with unwanted pregnancies actually had over twice the rate of this condition than those with intended pregnancy (Cheng et al., 2009). Choosing to terminate a pregnancy may also carry a slight risk of mental health consequences. While a systematic review by Charles, Polis, Sridhara, and Blum (2008) found no evidence that abortion results in lasting mental health conditions, a minority of women studied did report enduring feelings of guilt, depression, and regret; and Hamama, Rauch, Sperlich, Defever, and Seng (2010) found that women's appraisals of their abortion experiences related to its psychological effects. Specifically, appraisals of the abortion as a "hard time" (p. 704) predicted the onset of depression and posttraumatic stress disorder in a

subsequent pregnancy, especially if they felt that it was the most or second most traumatic experience of their life. Thus, under certain circumstances, pregnancy termination may have negative mental health consequences for some women.

An unplanned or casual sexual encounter can have negative effects on women even in the absence of physical health consequences. Fielder and Carey (2010) found that women who engaged in "penetrative hookups" had greater risk for emotional distress. Another study of undergraduate women conducted by Eshbaugh and Gute (2008) showed similar results: instances of casual sex with someone only once or with someone known for less than 24 hours was a significant predictor of regret, and having multiple sex partners had a strong association with sexual regret. The feelings of shame and self-doubt that often occur in women following an unplanned sexual encounter (Eshbaugh & Gute, 2008) could impact future safer sex practices, as adolescent girls with lower self-esteem were less likely to have protected sex (Ethier, Kershaw, Lewis, Milan, Niccolai, & Ickovics, 2006) while students with higher self-esteem tended to report greater self-efficacy for condom use (Gullette & Lyons, 2006).

Sexual assault and other instances of coerced sex can likewise cause psychological harm, and many typical college practices, such as the "hookup culture" and excessive alcohol consumption, create a threatening environment. Downing-Matibag and Geissinger (2009) found that a number of young women during hookups had been verbally or physically coerced into unwanted sexual intercourse, though none of them regarded the experience as rape. Similarly, a study of college students who used alcohol found that almost one out of seven college drinkers experienced some kind of unwanted sexual advance, and female students were more than twice as likely to report an unwanted sexual advance when drinking (Novik, Howard, & Boekeloo, 2010). A variety of factors may inhibit young adults from recognizing the gravity of coerced sex.

Focus groups with college students revealed that some undergraduate young men believe that women use alcohol intoxication as an excuse to have sex without having to accept any responsibility (Lindgren et al., 2009a). The college "hookup culture," which emphasizes no emotional commitment to the casual partner, may promote such disregard for the other person's needs and desires that sexual coercion seems acceptable (Downing-Matibag & Geissinger, 2009). The perceived significance of unwanted sexual acts' has been shown to influence the degree of outrage they produce; for example, "stealing a kiss" is not considered a very serious offense (Humphries, 2007).

This population's preferred means of expressing sexual consent may aggravate the issue of coerced sex. Young adults typically utilize unspoken and indirect methods of communicating about sex, especially young women when they are trying to indicate that they have no interest in someone (Lindgren et al., 2009a). Humphries (2007) also found that young adults' perceived need for explicit sexual consent depends on the length and extent of a couple's relationship; that is, the longer two people have been together, the less need for explicit consent. Failure to distinguish sexual desire from sexual consent also places young people at risk. As Muehlenhard and Peterson (2007) note, a person may "want" sex due to feelings of attraction or sexual arousal yet not consent because he or she wishes to avoid its consequences. In their study of consensual and nonconsensual sex in women, 54.5% of women who experienced rape did not label it as such. Compared to the women who did use the label, these women reported a greater desire for sex prior to the incident. Such findings have serious public health implications, as women who felt sexual desire but did not consent to sex may experience "victim-blaming" when reporting their attacks, or they may not acknowledge their assault and so not seek necessary support (Muehlenhard & Peterson, 2007).

3.0 METHODS

Female undergraduate students face diverse and pervasive sexual and reproductive health issues, which can be addressed through increased sexual health knowledge and changed attitudes toward safer sex within this population. Achieving such outcomes will be challenging, as most people do not think about their health daily (Nelson, 2011), especially young populations who typically view themselves as personally impervious to negative health outcomes (Hale & Dillard, 1995). Strategically conducted health communication efforts may raise awareness and change attitudes so as to promote female undergraduate sexual and reproductive health. As cited in Schiavo (2007), the CDC defines health communication as "the study and use of communication strategies to inform and influence individual and community decisions that enhance health" (p. 5). Health communication draws lessons from diverse disciplines such as health education, mass communication, and social marketing (Schiavo, 2007). This relatively new field has gained prominence in the United States as the nation's prevailing chronic and infectious health problems become increasingly linked to individual- and community-level behavioral patterns and lifestyle choices (Kar, Alcalay, & Alex, 2001).

Some health communication strategies are suited to address environmental factors such as policies and program availability while others can more effectively alter communities' or individuals' behaviors (Parvanta, 2011d). Social change typically results from a series of smaller changes in behavior within individuals, populations, or communities (Schiavo, 2007). Health

communication efforts with the goal of behavioral change do not seek merely to inform, that is, provide the target population with answers to their questions. They instead want the presented information to elicit specific responses in the target audience; to garner these responses they must employ theories of behavior change (Parvanta, 2011a). Besides solid theoretical bases, a strong health communication campaign will be grounded in research, utilize carefully-crafted and appealing messages and materials, and possess a strategic and organized plan of action and evaluation.

Health communication programs must have a strong strategy and action plan, with all activities addressing needs that were indicated in preliminary research and confirmed by the target population (Schiavo, 2007). The health communication planning process essentially consists of a series of subplans. A macro plan involves analysis of the pertinent health issue, its ecological setting, the intervention strategy, and the target population. The strategic health communication plan meanwhile concentrates on achieving exact change objectives and focuses on specific messages, audiences, and media (Parvanta, 2011a). Health communication planners should form the strategic health communication plan before devising the implementation plan, which establishes the program's activities, their time frame and locations, as well as the sources of funding. Other subplans, including the evaluation plan and the partnership plan should also be designed early in the planning cycle (Parvanta, 2011a).

3.1 THE PRECEDE-PROCEED PLANNING MODEL

Logic models provide a useful means of visually depicting such project plans for systematic review. Typically arranged as flow charts, logic models require the planners to list the resources

available, what activities will utilize the resources, and the expected results from these activities. The resulting product can act as a "road map" that helps stakeholders and planners to identify a program's strengths and weaknesses and make necessary changes as the program develops (W.K. Kellogg Foundation, 2001). Gielen, McDonald, Gary, and Bone (2008) describe the PRECEDE-PROCEED model of program planning as a logic model, because it incorporates the phases of causal assessment, program planning, and subsequent evaluation into an encompassing framework.

This model consists of eight sequential phases, divided evenly into the PRECEDE and PROCEED components. Its first half, PRECEDE (Predisposing, Reinforcing, and Enabling Constructs in Educational/Ecological Diagnosis), involves a set of assessments that gather quantitative and qualitative data about the target population's health status and the factors that impact their health (Green & Kreuter, 2005). PROCEED (Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development) consists of the intervention itself and subsequent evaluations of the process, impact, and outcome (Gielen et al., 2008). Although the project team began the *Adventures in…*project with no formal plans, they nonetheless applied relevant concepts from many of this planning model's phases. Further, the author intends that future development of the project will be guided by the PRECEDE-PROCEED model.

3.1.1 Phase 1: Social Assessment

During the first phase, planners conduct various data collection activities (e.g. surveys and interviews) to gain understanding of the target population (Gielen et al., 2008). This assessment helps to communicate the various needs, desires, and perspectives of the community. Conducting a needs assessment (formally or informally) can help to determine the target population's

existing health knowledge and skills (Nelson & Parvanta, 2011) as well as which populations and ecological levels are affected by the health issue (Parvanta, 2011a). It therefore is necessary to consult with representatives and members of the target population when planning health communication efforts, as their feedback will help to merge evidence from the literature with the community's needs and desires (Parvanta, 2011a). Further, health communication planners must have flexibility so that their efforts can be adapted to meet the needs of the target population. The majority of health communication efforts in fact change from the planners' original designs based upon input from important stakeholders (Schiavo, 2007).

When seeking to implement their health communication project, the project team met with health educators and students at the University of Pittsburgh-Main Campus to assess whether the student population could benefit from health communication materials on safer sex practices. These stakeholders confirmed that such a need existed. With their assistance, the project team created a health communication item that conveyed important sexual health information. The students also suggested further relevant sexual health topics to cover in subsequent project materials.

3.1.2 Phase 2: Epidemiological, Behavioral, and Environmental Assessments

In the next phase, planners either conduct original research or do secondary analysis of existing regional data to identify pressing health issues and their behavioral and environmental components (Gielen et al., 2008). Besides gauging the target population's needs and desires, a strategic health communication effort will examine the environmental factors that could affect efforts to promote their health. Health communication planners can find such data with a SWOTE analysis, an assessment tool that encompasses the strengths, weaknesses, opportunities,

and threats within the environment, along with the ethical considerations that guide those in public health (Parvanta, 2011c). Strengths refers to either the attributes of the organization conducting the intervention (e.g. material resources and staff abilities) or of the intervention itself. Similarly, weaknesses can describe organizational gaps such as lack of material resources or low staff commitment, or the intervention's weaknesses (e.g. limited accessibility and production costs). Threats are the factors that could inhibit accomplishing the intervention's objectives, such as environmental issues, while opportunities include the environmental factors that could facilitate the intervention's efforts (Parvanta, 2011c).

Collaboration with community organizations offers a useful means of addressing weaknesses and accumulating strengths. Health communication planners can select partners based upon the resources, influence, and other support they can offer, but these partners should have experience with the community, share the health communication effort's vision, and be stakeholders within the community (Parvanta, 2011a). Community involvement likewise can impact the assessment of opportunities and threats. The community's health-based agencies, such as health departments, educators, and social service agencies, can identify existing communication resources for the target population (Nelson & Parvanta, 2011).

In the case of the *Adventures in…* project, collaboration occurred with health educators and students employed as peer health educators with the University of Pittsburgh Student Health Services. This partnership provided the project team with multiple opportunities to improve and circulate the health communication booklet. Potential threats, such as having the material mistaken for inaccurate sex-negative health communication, were likewise avoided thanks to the stakeholders' insight. These stakeholders also confirmed that the novelty of the interactive

booklet was a crucial strength of the intervention. Their input further helped the project team to ensure that the narrative did not unknowingly promote unhealthy behaviors.

Concern for the community is another crucial part of designing an intervention, and it aligns with bioethics, the branch of ethics relating to the health professions (Parvanta, 2011c). From the initial setting of goals to the evaluation planning, the health communication planners must consider the following: avoiding harm in the pursuit of good, respect for individuals' and communities' autonomy over life decisions, and maximizing the limited resources of health promotion efforts. Some specific considerations include ensuring that the community collaboration does not result in exploitation or appear coercive, that the messages do not engage in victim-blaming or imply that individuals with a health problem caused their trouble, and that the assessment process involves members of the target population (Parvanta, 2011c). Besides their ethical considerations, health communication planners should follow the SMART (Specific, Measurable, Achievable, Realistic, and Time-phased) criteria when setting change objectives. All objectives must specify what will be accomplished and by whom, as well as in what time frame they will be met or measured. Health communication planners also have to think realistically about whether they could achieve their objectives with the resources available to them, and if accomplishing these objectives would actually address the health issue of concern. Finally, the program objectives should be quantitatively measurable so that the program planners can determine if they were reached (CDC, 2009a).

Due to the *Adventures in…* project's serendipitous transition from class assignment to health communication effort, the project team did not begin with any set objectives. The project team would eventually form rudimentary objectives in terms of distribution and development. However, the SMART criteria were not taken into consideration. As will be discussed later,

better formed objectives would have benefited the project team's initial efforts and must be part of future actions taken by the *Adventures in…* project.

3.1.3 Phase 3: Educational and Ecological Assessment

Once the planners choose which factors to focus on, they determine in the third phase what factors are necessary to promote and maintain change. These factors can be categorized as *predisposing, reinforcing,* or *enabling*. Predisposing factors precede and motivate a behavior, and include beliefs, attitudes, and feelings of self-efficacy. Enabling factors likewise exist prior to behavior change and refer to factors that could facilitate behavior performance, like available resources and services. Reinforcing factors comprise matters such as peer influence and social support that incentivize continuing a behavior. Health interventions that seek individual- or community-level behavior change will address the identified predisposing, reinforcing, and enabling factors, so it is at this stage that behavior change theories become especially useful (Gielen et al., 2008).

As Perloff (2001) observes, "persuasion is self-persuasion" (p.11), because while health communicators may provide the impetus, it is ultimately individuals who change their behaviors. Most efforts to produce behavior modifications use at least one of the following theories: the Integrative Model, the Health Belief Model, and Social Cognitive Theory (Parvanta & Parvanta, 2011). The Integrative Model (IM) was developed from the Reasoned Action Approach, which encompasses both the Theory of Reasoned Action and the Theory of Planned Behavior (Fishbein, 2008). According to this model, one's intention to perform a health behavior best predicts if that behavior will occur.

Three types of beliefs determine behavior intentions. *Behavioral beliefs* refer to one's expectations of positive or negative outcomes that will result from the behavior, and *normative beliefs* are one's perceptions of what others think about the behavior. Normative beliefs further includes one's desire to comply with what others think should be done. These two types of beliefs together form *perceived normative pressure* (Parvanta & Parvanta, 2011); that is, the level of social pressure one feels in relation to performing a behavior (Fishbein, 2008). Finally, *control beliefs* describe one's perceived facilitators and barriers to doing a behavior (Parvanta & Parvanta, 2011). While the IM names intention as the primary predictor of a behavior, it nonetheless acknowledges that intention may not translate to behavior if environmental factors pose barriers to that behavior or if one lacks the skills or abilities to do it (Fishbein, 2008).

The IM's constructs strongly relate to safer sex practices in the undergraduate population. Perceived normative pressure, the combination of behavioral and normative beliefs, holds particular importance due to the typical preoccupation that young adults have with their peers' opinions and practices. Downing-Matibag and Geisinger (2009) found that students could be discouraged from using condoms during oral sex out of concern that it was not normal for their population; one young man reported that the practice might instead be normal conduct for "porn stars." Many college students also worry that suggesting condom use will imply that they or their potential partner have an STI or are promiscuous (Perloff, 2001), further indicating that this population does not perceive consistent condom use as the normal practice. A 2005 study of college students' perceived norms and actual sexual practices by Scholly et al. confirmed the existence of such misperceptions. While the majority of sexually experienced students reported minimal rates of STIs and unintended pregnancies, they greatly overestimated those of their peers. These students also seriously underestimated any condom use in the last 30 days by their

peers, despite the fact that most students reported using a condom at least once in the last 30 days. Changing college students' social norms regarding condom use has in fact been suggested as a means of better promoting campus sexual health (Bontempi et al., 2009; Scholly et al., 2005).

While the IM focuses on intention as a predictor of health behaviors, the Health Belief Model (HBM) emphasizes the effects of perceived vulnerability to serious health risks. Developed by Godfrey Hochbaum (Champion & Skinner, 2008; Steckler, McLeroy, & Holtzman, 2010), this model asserts that to adopt a healthy behavior, individuals must realize their risk for a serious health issue, decide that the behavior's possible benefits supersede its potential consequences or barriers, and believe that they are capable of performing that behavior (Champion & Skinner, 2008). The HBM has six constructs: *perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action,* and *self-efficacy.* Perceived susceptibility refers to people's beliefs about how likely they are to develop or contract a health condition, while perceived severity involves their beliefs on the condition's seriousness, including the medical, clinical, and social consequences of contracting it or leaving it untreated. The combination of these two concepts is known as *perceived threat* (Champion & Skinner, 2008).

Numerous studies document college students' striking lack of perceived susceptibility to STIs. This disbelief that negative outcomes could happen to them, or *illusion of invulnerability,* arises partly from their assumption that being in a monogamous relationship ensures their safety (Perloff, 2001). However, so many young adults move from one monogamous relationship to another (the previously discussed practice of "serial monogamy") that unprotected sex poses serious health risks. Corbin and Fromme (2002) also found that 66% of participating college

students named someone a “regular partner” despite knowing the person for under six months. Despite often not knowing their partners for very long, many young women nevertheless regard their partners as “safe” without evidence from STI tests; they instead rely on subjective information like their partners’ assurances of being disease-free or answers to their vague questions regarding these partners’ sexual history (Civic, 2000; Bolton, McKay, & Schneider, 2010). Even in instances of casual sex, many college students will not insist on using a condom if the potential partner does not seem like “the type” of person who would have an STI, a practice that Downing-Matibag and Geisinger (2009) term *partner trust*. Sometimes young adults will even have unprotected sex because of *community trust*, the notion that HIV/AIDS and other STIs are not prominent in their geographic area (Downing-Matibag & Geisinger, 2009). Many young adults also do not realize that oral sex can transmit STIs (Royer & Zahner, 2009), further limiting their perceived susceptibility.

This lack of perceived susceptibility to STIs connects to the HBM’s constructs of *perceived benefits*, the estimated benefits of performing a recommended health behavior, and *perceived barriers*, the possible negative consequences of that health behavior (Champion & Skinner, 2008). For students who think they face few sexual health risks, condom use offers few perceived benefits (Perloff, 2001). The perceived barriers, meanwhile, are numerous. Besides concern that condoms decrease sexual pleasure (Civic, 2000; Downing-Matibag & Geisinger, 2009), many young adults worry that requesting condom use will insult their partner or imply that one of them is promiscuous (Perloff, 2001). Possible embarrassment during the purchase, use, or negotiation of condoms can also inhibit young adults’ safer sex practices (Helweg-Larsen & Collins, 1994).

Cues to action, strategies that initiate willingness and preparation to practice a healthy behavior, can be utilized to help young adults practice safer sex. Some cues to action include raising awareness and reminder methods (Champion & Skinner, 2008). However, the adoption of safer sex practices depends significantly on *self-efficacy* (Perloff, 2001; Champion & Skinner, 2008; Downing-Matibag & Geisinger, 2009). A key concept in Bandura's Social Cognitive Theory (SCT) (1986), self-efficacy refers to one's confidence in his or her ability to successfully perform a behavior and achieve a desired outcome (McAlister, Perry, & Parcel, 2008). According to SCT, people with high levels of self-efficacy will feel more confident discussing safer sex with their partners and be more likely to actually practice safer sex (Perloff, 2001). Consistent safer sex practice has in fact been associated with higher levels of self-efficacy regarding condom use (Peterson & Gabany, 2001), and improving young women's self-efficacy on condom use and negotiation can result in significant decreases in their risky sexual behaviors (Champion & Skinner, 2008). Self-efficacy can, however, depend upon the situation: many students who typically feel confident in discussing and using condoms become insecure in situations involving oral sex or sexual activity while intoxicated (Downing-Matibag & Geisinger, 2009).

Social Cognitive Theory asserts that individual behavior results from continuous interaction between one's internal perceptions and psychosocial characteristics and the external environment, a process labeled reciprocal determinism (Parvanta & Parvanta, 2011). This theory's five constructs (*psychological determinants, observational learning*, *environmental determinants of behavior, self-regulation,* and *moral disengagement*) (McAlister, Perry, & Parcel, 2008) reflect the interplay between the individual and the environment. Individual- and community-level interventions to bring about behavioral changes could effectively focus on

psychological determinants, *self-regulation*, and *observational learning*. Self-efficacy falls within the construct of *psychological determinants*. *Outcome expectations*, one's beliefs about the likelihood of results from a behavior and the value of those results, are another psychological determinant; in relation to sexual health, they can reflect beliefs about condoms' effects on sexual pleasure.

Self-regulation meanwhile pertains to self-controlling actions like setting goals toward behavior change and seeking social support (McAlister, Perry, & Parcel, 2008). Peer support of condom use has been associated with safer sex intention and practice in young adults (Kennedy, Nolen, Applewhite, Zhenfeng, Shamblen, & Vanderhoff, 2007). Individuals can also learn from examples set by peers (interpersonally or through media), the process of *observational learning* (McAlister, Perry, & Parcel, 2008). Role models can educate a target population by offering information to support change and modeling the change steps, such that they are very effective at enhancing self-efficacy for those similar to themselves. They can further adjust the audience's outcome expectations by demonstrating the beneficial effects of performing a health behavior (Parvanta, 2011e). Role modeling of safer sex behaviors has indeed proven to be an effective means of promoting young adults' sexual health, especially through the use of role model stories (Lauby, Smith, Stark, Person, & Adams, 2000), a topic that will be elaborated upon later.

This project's basis lay in the Health Belief Model, with particular emphasis placed on perceived susceptibility. The project team members strove to create a realistic and relevant health communication item that demonstrated how easily a young woman could find herself in an unsafe sexual scenario. They likewise attempted to address the model's other constructs by creating a supportive sex-positive tone and describing safer sex practices. As the author would

determine, such consideration resulted in applying relevant constructs from Social Cognitive Theory and the Integrative Model.

3.1.4 Phase 4: Administrative and Policy Assessment and Intervention Alignment

Once the needs assessment has finished, the next phase consists of determining the appropriate intervention to address the identified issues. Some of the strategies available to enacting changes in predisposing, reinforcing, and enabling factors include mass and small media. Designing such media comprises multiple considerations, including the target population's literacy levels, culture, and preferred media. A successful health communication campaign must have messages and materials that will garner the target population's attention. Attention to a message can be conceptualized along a continuum, with a passive, mindless response on one end and an active, mindful response on the other (Parrott, 1995).

Involvement with the message's topic impacts how greatly one will attend, such that engaged audience members will actively seek, attend, and process messages, while less involved ones will passively process the information (Petty & Cacioppo, 1986). However, fostering involvement with a message can be complicated by the audience's existing biases. People have the tendency to show confirmation bias; that is, they interpret messages as confirming their existing beliefs. There is also the issue of selective exposure, in which people favor information sources with which they already agree (Nelson, 2011). However, a health communication material's appearance and message can effectively overcome an audience's selective attention (Monahan, 1995).

Humans can process only a limited amount of information, and the presentation of the information affects what inferences they make (Nelson & Parvanta, 2011). According to Petty

and Cacioppo's (1986) Elaboration Likelihood Model, people already interested in an issue will attend to new information about it, while those with low personal involvement may have their attitudes affected by peripheral stimuli ("peripheral cues") such as endorsements from popular figures and appealing audio or visual effects. When health communication materials utilize artwork, music, or other effects to induce positive mood or imagery to "sell" a message, they rely on heuristic appeals; that is, indirect approaches to members of the target population when they lack the time, skill, or motivation to assess a message's attributes and benefits (Monahan, 1995).

3.1.4.1 Creating an appealing material

The attractiveness of a material depends greatly on factors such as the type of message sought and the target population's preferences. However, there are some guidelines to facilitate the design process. A visually appealing item will display colors with enough contrast to be vibrant but not clashing. When choosing color schemes, health communication designers must be aware that some colors do not translate well from designing software packages into print (especially depending upon the type of paper being used) (Thomas, 2009). Also, colors can convey different meanings across populations, such as the color white symbolizing "purity" in Western cultures while symbolizing "death" in Eastern cultures (Ambrose & Harris, 2006). Because certain color combinations may be culturally unacceptable depending on the target population, it is important to understand the target population before creating materials (Thomas, 2009).

Written materials need ample white space, clear margins, and space between paragraphs (Nelson & Parvanta, 2011). Health communication designers must judiciously choose font styles as well, using two different styles at most. The material's headers should be in sans serif style and the text in serif style (Thomas, 2009). The terms "sans serif" and "serif" refer to categories of typeface. Serif fonts contain small strokes or cross lines ("serifs") at the ends of the horizontal

and vertical components of a letter while sans serif fonts do not. Serifs improve a material's readability because they assist the eye in progressing to the next letter (Ambrose & Harris, 2006). Whatever typeface is chosen, the font used should remain consistent; a different font should appear only to present important information (Thomas, 2009).

Communication designers can also create internal and external requests for audience attention. External requests are overt statements in the message that instruct the audience to pay attention (e.g. "Listen to the message!"). Alternatively, health messages can produce physiological or psychological responses in the audience members that produce a self-command, or internal request, to pay attention (Parrott, 1995). Petty and Cacioppo (1986) report that audience members' attention to messages increases with the amount of personally relevant information. Simply using the term "you" in a message rather than a more general one like "people" can be enough to increase the personal relevance of a message (Parrott, 1995).

Such targeted word choice is an example of *Denotative Specificity*, the practice of using language that explicitly states the agent, object, and/or action in a message (Parrott, 1995). Other concepts likewise affect how directly a communication item relates to its audience. *Spatial Immediacy* refers to using demonstratives such as "this" and "these" to give the language greater immediacy while *Temporal Immediacy* involves using present tense verbs when discussing present events. *Qualifiers* are words or phrases that express uncertainty, such as "possibly," and "could be," and should be avoided (Parrott, 1995).

Although health communication designers want to create artistically appealing material, they foremost must focus on creating one that the target audience will understand. As Schiavo (2007) notes, "No matter how accurate, compelling, or graphically appealing information appears to be, the overall purpose of any materials or verbal communication is defeated if people

cannot understand it" (p.63). When creating written materials, care must be given to both literacy and health literacy. Literacy refers to one's ability to comprehend information, while health literacy goes beyond basic skills to include knowledge and the ability to use acquired information to make health decisions (Nelson & Parvanta, 2011). Low health literacy is a particular issue in the United States: the Institute of Medicine found in 2004 that approximately 90 million American adults had trouble understanding or utilizing health information (Schiavo, 2007).

Nelson and Parvanta (2011) recommend that health communication designers seeking to build a target population's health literacy should foremost keep all communication simple, structure the information into small portions, and create messages that will catch the audience's attention. Sentences should be concise, simple, and written in the active voice with everyday language (avoiding jargon) at between a 5th and 8th grade reading level. Numerical data should appear sparingly (one or two numbers at most) and be presented in context. A material's overall design and layout should likewise be easily understood (Nelson & Parvanta, 2011). A health message further must have clarity in that it clearly states what the target audience should do with the information provided (Parvanta, 2011b). Messages designed to invoke a sense of personal responsibility have been shown to motivate people to process issue-relevant arguments (Petty & Cacioppo, 1986; Parrott, 1995).

An effective health communication campaign will include community involvement in the creation of the health messages and materials. Pretesting of materials and messages is recommended (Nelson & Parvanta, 2011), and should occur with members of the target population and their gatekeepers (those with some power over the dissemination of the materials) to assess plausibility, clarity, and attractiveness (Parvanta, 2011b). Community involvement also

promotes the creation of culturally competent materials. Culture, "the socially transmitted shared system of knowledge" (Peoples & Bailey, 1988, p. 445), impacts individuals' preference for types of health information, who they will trust to provide this information, and how they will evaluate it (Nelson & Parvanta, 2011); it can also affect safer sex decisions and views of reality (Perloff, 2001). Cultural competence, defined by Schiavo (2007) as "the ability to relate to the unique characteristics of each population or ethnic group and to address them in an efficient way" (p. 58), thus plays a crucial role in strategically planning a health communication campaign. A culturally competent health communication campaign will take into account the target audience and whatever subpopulations it may contain. It will further respond to their values and create customized messages that utilize appropriate cultural references (Schiavo, 2007).

3.1.4.2 Selecting an appropriate message frame

Formative research would further help to determine what type of frame would most effectively reach members of the target audience (Parvanta & Parvanta, 2011). A health message's framing significantly impacts target audience response to the presented information. Framing means to place a message within a context or to suggest what interpretation to take from it. Gain-framed appeals emphasize the health advantages of taking a recommended action, while loss-framed appeals highlight the health disadvantages of not taking a recommended action (Parvanta & Parvanta, 2011). While individuals' varying levels of risk perception can moderate the effects of framed appeals (Parvanta & Parvanta, 2011), positive (gain-framed) appeals generally are more effective at promoting prevention activities like contraception while negative (loss-framed) appeals tend to better promote detection behaviors like self-breast exams (Nelson & Parvanta, 2011).

Fear appeals are a particularly prevalent form of loss-framed messages in health communication. Defined as "persuasive messages that emphasize the harmful physical or social consequences of failing to comply with message recommendations" (p. 65), fear appeals are widely present in the media (Hale & Dillard, 1995), and especially utilized to educate young populations. Most colleges' traditional health education efforts have such focus on the serious consequences of high-risk behaviors that the practice has been labeled "health terrorism" because of its efforts to "scare the health into people" (Scholly et al., 2005, p. 160). Although quite popular, fear appeals can often produce the opposite of their intended effects. If they appear banal or unrealistic, this kind of health message will go unheeded (Perloff, 2001). Focusing on some students' risk-taking could also send the message that many students actually engage in such unhealthy behaviors and so prompt young people to adopt them as a means of conformity (Scholly et al., 2005). Overexposure to fear appeals can likewise lessen their impact (Parvanta, 2011b), such as how exposure to AIDS prevention messages starting at young ages has caused young people to be desensitized to these messages (Perloff, 2001).

Even when they effectively produce fear in the audience, fear appeals may not yield behavior changes. Janis and Feshbach found that an inverse relationship existed between message compliance and the amount of fear used in the appeal (as cited in Witte, 1997, p. 424-425). Based on their results, these researchers argued that health messages should employ minimal levels of fear. Otherwise, the audience members could experience too much anxiety and respond with defensive avoidance, the inclination to discount or deny the negative outcomes portrayed in a message (as cited in Hale & Dillard, 1995, p. 67). Media coverage of heterosexual young people's HIV susceptibility in the 1980s provides a notable example of this phenomenon. The media created such bleak projections that many individuals responded by defensively

avoiding useful information and essentially denying that danger existed. Consequently, instead of acknowledging their health risk, many young adults instead chose to adhere to the illusion of invulnerability and believe that they were personally impervious to the threat (Perloff, 2001).

The aforementioned HIV-awareness campaign made a crucial mistake in that it did not equally emphasize the actions that the members of the target population could use to protect themselves (Perloff, 2001). Audiences can respond to message-induced fear with fear control (the need to decrease their frightened feelings), danger control (the need to lessen the message's depicted harmful outcomes), or both. While audiences might achieve fear control through distractions, denial, or avoidance, danger control could effectively yield compliance with the message (Hale & Dillard, 1995). According to Witte's (1997) Extended Parallel Process Model, what Perloff (2001) calls "the most comprehensive theory of fear appeals" (p.75), message compliance will occur only if the audience perceives a threat and feels capable of addressing that threat. Thus, health communication messages should have threat and efficacy elements. The threat element will convince the audience of their susceptibility to a severe threat, while the efficacy component will demonstrate that the recommended health behavior will prevent the threat (response efficacy) and that they themselves can perform such behaviors (self-efficacy) (Witte, 1997). Because it emphasizes both perceived threat and perceived efficacy, Perloff (2001) states that the Extended Parallel Process Model particularly relates to the Health Belief Model and Social Cognitive Theory.

Health communication materials that seek to persuade audiences and induce behavior change typically should utilize both gain- and loss-frames so that the audience's risk perceptions and resulting choices do not become biased (Nelson & Parvanta, 2011). Health campaigns have often relied on two main methods of persuading an audience: fear appeals and straightforward

presentations of fact. On the other hand, commercial advertising tends to avoid rational claims and negative affect and instead focuses on creating positive feelings, based upon consistent research findings that the arousal of positive emotions yields more positive opinions of a product and more intent to comply with a message (Monahan, 1995). Health communication campaigns aimed at college students must align with their unrestricted environment, one in which students may be sexually active (sometimes under the influence of alcohol), perceive little susceptibility to STIs, and do not want to discuss HIV because it brings up defensive feelings and does not seem to be prevalent on campus. To reach young audiences like college students, it is strategic to focus on perceived norms (such as how many young people would support condom use) rather than directly addressing illusions of invulnerability (Perloff, 2001).

Useful information could effectively reach this population by using humor to lower the tension surrounding the topics of safer sex (Perloff, 2001). Positive affect appeals may garner more attention because printed health messages are often straightforward and clinical (Parrott, 1995). Further, positive affect (especially through presenting humor or touching situations) may be useful for reaching audiences who already feel very familiar with a health campaign and consequently would not attend to new information. Health messages with positive affect that invoke feelings of empathy or compassion can help audience members to reframe issues as personally relevant or salient. For example, only empathic public service announcements about AIDS caused college students to have significant changes in their subjective probability ratings that they or someone they know could become infected with HIV (Monahan, 1995). Although potentially quite effective, humor appeals require much skill because what is considered funny varies widely across a population. The public's general sense of what is humorous also can

rapidly change (Parvanta, 2011b). Therefore, it is crucial that members of the target audience at least pretest the materials if they do not assist with the overall design and development.

3.1.4.3 Selecting an appropriate media channel

It is likewise crucial to understand the target population's preferred channels of communication when planning a health communication campaign (Schiavo, 2007). The United States population consumes vast amounts of both traditional media (e.g. television and print materials) and new media (e.g. social media websites such as Facebook) (Parvanta & Parvanta, 2011). These channels can play such a valuable role in a health communication campaign (Schiavo, 2007) that the CDC has initiated the creation of a Hollywood, Health, & Society (HHS) program (Parvanta, 2011e). This program conducts continuous methodical outreach to Hollywood producers and writers to direct how health messages are incorporated into storylines (Parvanta & Parvanta, 2011). The media can play such a significant role in health that interventions targeted to young populations about their risk behaviors commonly use Entertainment Education (EE) (Parvanta, 2011b), the process of designing and implementing educational and entertaining messages that promote behavioral or social change (Parvanta et al., 2011).

EE can employ many theoretical constructs. The use of images and music can act as the peripheral cues described by the Elaboration Likelihood Model. Audience members' perceived normative pressure, a concept in the Integrative Model, can be altered by EE through norming, a process in which the message calls "attention to actual normative behavior versus perception of minority behavior as norm" (Parvanta, 2011e, p. 186). EE especially applies to Social Cognitive Theory's observational learning construct, because dramatic entertainment such as narratives can present models of healthy behavior (Parvanta, 2011e). Role model stories, in which members of the target population discuss their actions toward health behavior change for others to imitate

(CDC, 2007), have served multiple initiatives to promote safer sex practices (Corby, Enguidanos, & Kay, 1996; Rietmeijer, et al., 1996; Terry et al., 1999), resulting in increased rates of condom use (Rietmeijer, et al., 1996; Lauby et al., 2000). Role models can adjust people's perceptions of a behavior's benefits and barriers, effectively enhance the self-efficacy of the audience, and show how to consider a problem, cope with setbacks, and accomplish a goal (Parvanta, 2011e).

Narratives meanwhile can emotionally engage readers in a way that limits their ability to discount health messages and gives them a more positive overall opinion of the story (Kreuter et al., 2010). Further, experts in disciplines spanning from cognitive and social psychology to literary studies argue that thought takes a narrative form such that humans code information into storylines, characters, and scenes (Parvanta, 2011e). Because most people process information in story form starting at young ages, they may remember information better when it is contained in narratives (Kreuter et al., 2010). Audiences can attend to and remember health information presented in soap operas and situation comedies (Parrott, 1995), and narrative videos about breast cancer have performed better than didactic videos at increasing intention and reducing perceived barriers to mammography (Kreuter et al., 2010).

Written narratives (besides role model stories) have similarly affected the target audience's health behaviors, such as the media campaign of Project SAFE (Stay AIDS Free through Education) (Perloff, 2001). The project distributed comic books that graphically covered drug users' AIDS risks, along with brochures and condoms, resulting in increased awareness of AIDS as a serious health issue, publicizing Project SAFE itself, and motivating phone calls to its hotline (Perloff, 2001). Nonetheless, although traditional stories and drama can impart lessons, the reader plays a passive role (Marsella, Johnson, & LaBore, 2003). Another approach, interactive fiction, may engage the reader as an active learner. Interactive fiction can refer to a

narrative that asks the reader to choose the character's actions and affect the story's plot (but for an opposing opinion, see Kaplan (2009)). Examples of this type of story include the *Choose Your Own Adventure*® and the *Scenarios*® series.

Although the recent *Scenarios*® book series utilizes interactive fiction as didactic outreach to affect young girls' decision-making (Barbour Publishing, Inc., 2008), searches of the current literature indicate that no interventions thus far have employed this form of narrative for health outreach or promotion. Interactive media, however, have been used successfully in multiple technology-based health interventions (see for instance Beard, Kumanan, Morra, & Keelan, 2009; Markham, Shegog, Leonard, Bui, & Paul, 2009; Drost, Cuijpers, & Schippers, 2010). Markham et al. (2009) developed "+Click" (Positive Click) to educate HIV+ youth on health topics such as delaying sexual activity and appropriate condom use. This Internet-based educational application took the form of a virtual two-dimensional shopping mall where informational videos, skill-building activities and other features on each health topic were available at different places in the "mall." Short-term outcomes of this intervention included significantly increased levels of self-efficacy for delaying future sexual activity and using condoms.

Computer-based simulations are a form of interactive media that allow users to play active roles and make thoughtful decisions in a responsive and safe environment. The experiential nature of simulation facilitates building both knowledge and skills, while having numerous chances to make decisions encourages knowledge acquisition (especially shorter simulations as the user may focus on the content) (Dumas, Szilas, Richle, & Boggini, 2010). Interactive Pedagogical Drama (IPD) refers to an educational tool in which the learner engages with realistic characters, controls a character's decisions, and see the results of those decisions

(Marsella, Johnson, & LaBore, 2003). Users of Carmen's Bright IDEAS, an IPD targeted to mothers of pediatric cancer patients to build their social problem-solving skills, reported that the simulation helped them to remember and understand the problem-solving skills presented in the materials. Several users also preferred to use the IPD rather than read a story or watch a video (Marsella, Johnson, & LaBore, 2003).

Virtual worlds created primarily for entertainment are also being utilized for health promotion (Beard et al., 2009; Parvanta & Parvanta, 2011). A review by Beard et al. (2009) found that numerous health-based organizations, such as the CDC, Ann Myers Medical Center, and University of Plymouth (UK), use the virtual world Second Life (where users create virtual selves ("avatars") to interact with others) to offer educational and skill-building activities on topics such as mammography, safer sex, and mental health conditions. Some of the results of outreach efforts in Second Life include users' increased empathy and awareness and reduced stigma toward the conditions Autism and Aspberger's Syndrome and greater understanding of schizophrenia and hallucinations (Beard et al., 2009). Other virtual simulations have shown favorable health promotion results. Parvanta and Parvanta (2011) discuss the CDC's collaboration with Whyville (a virtual world targeted to people ages eight to 12 years) to conduct a campaign for virtual vaccination against WhyFlu, a condition created by Whyville that produced red spots on the avatars' faces and sneezing as they chatted with other users. For the six week period that Whyville offered this condition, almost 9,000 users received the virtual vaccination, and 385,000 instances of virtual handwashing occurred (Parvanta & Parvanta, 2011). Evidence thus indicates that interactive entertainment media can effectively hold audience's interest and convey useful information.

Collaborative product development with stakeholders and members of the target audience at the University of Pittsburgh allowed the project team to create an appealing and effective interactive fiction narrative. As will be thoroughly covered in the Development and Discussion sections, the project team expounded much effort to ensure that the narrative included realistic scenarios and story details and had greater appeal than traditional materials like pamphlets and brochures. Multiple adaptations to the story and booklet were necessary to align with the stakeholders' suggestions, but the resulting product met with favorable response during its limited circulation. Present project efforts now include movement toward other media popular with the target population.

3.1.5 Phases 5-8: Implementation and Evaluation

The PROCEED portion of this planning model begins with the program's implementation, to be followed by process, outcome, and impact evaluations (Gielen et al., 2008). Social marketing provides a useful, systematic process of designing health interventions that the target population most likely will embrace (Parvanta & Parvanta, 2011). As cited in Butler (2001), Kotler defines social marketing as "the design, implementation, and control of programs seeking to increase the acceptability of a social idea or practice" (p.336). Social marketing utilizes commercial marketing principles to persuade the target population to adopt behavior change (Butler, 2001). This process stresses the four "Ps" of marketing: Product, Price, Place, and Promotion (Parvanta, 2011a). It comprises the critical components of audience segmentation, targeting, barriers, benefits, and competition (Parvanta & Parvanta, 2011).

Health communication efforts often try to convince the audience to replace its current practices (the competition) (Parvanta & Parvanta, 2011) for those that will yield often-intangible

benefits such as absence of disease (Butler, 2001). Planners of such efforts must therefore understand the target population's perspective of their "product" (the recommended health behavior), because its benefits must surpass the barriers to its use for the target population to accept it. Barriers and benefits meanwhile tend to be in the consumers' minds; in numerous instances, a behavior's greatest "price" is not its actual cost but psychological matters such as perceived social norms or existing attitudes (Parvanta & Parvanta, 2011). The places in which the target audience receives the product can likewise impact processing of the message and information. For example, situations where the target population may be stressed or sick (e.g. doctors' waiting rooms) may inhibit how they attend to health communication material (Nelson & Parvanta, 2011).

A useful means of reaching audiences is through segmentation, the process of dividing a population into smaller audiences, which can be effective at reaching and engaging a specific subgroup of people. This process facilitates targeting, the practice of focusing on a small subpopulation that shares important features. Health communication designers who decide to pursue targeting will utilize factors such as culture or demographics to appeal to the specific audience. Although sometimes used interchangeably, this term differs from tailoring, which is directing material toward a specific individual based upon data collected from that person (Parvanta & Parvanta, 2011). While they strive to design appealing messages and promotion activities, health communication designers must also ensure that they do not employ exploitative or misleading tactics, as commercial advertisers may sometimes do (Butler, 2001).

Circumstances that would arise during the project halted any efforts for evaluation. The author will discuss the necessity of soon evaluating the booklet's overall appeal as well as its didactic capability. However, the project team was able to employ many of the tenets of social

marketing. Application of the four “Ps” was particularly successful, though the project team also utilized other tactics such as audience segmentation.

4.0 THE PROJECT'S DEVELOPMENT

4.1 THE BEGINNING ASSIGNMENT

The *Adventures in…* project began in the 2009 spring semester as the final assignment for the University of Pittsburgh Graduate School of Public Health class BCHS 2504: Overview of Health Communication. This assignment required the creation of a "creative" item that utilized a less traditional method of communication. Classmates Anna Vitriol, Molly Ferguson, Meghan Talmadge, and Gina Londino formed a group to complete the assignment and decided that their project would focus on STI prevention through promoting safer sex practices. At Vitriol's suggestion, the group decided to create an interactive fiction item. Because decision-making plays a significant role in sexual health, a material in which the reader chose the character's decisions could effectively communicate relevant sexual health information. The group members chose to target the undergraduate student population for two reasons: an interactive booklet seemed more appropriate for younger audiences, and the prevalence of abstinence-only sex education programs in secondary schools leaves many young adults unprepared to practice safer sex when attending college.

In order for the story to be accurate and believable, the group decided that it should be told from the perspective of a Caucasian, heterosexual, female undergraduate student from a middle-class socioeconomic background, as those characteristics applied to all of the group

members. The main character would be a student at University of Pittsburgh-Main Campus because three of the group members had attended the institution for undergraduate study and so could use their own experiences to create the story. Consequently, the story would begin at a party in South Oakland, where the main character sees her "crush," a young man from her Freshman Studies class. South Oakland parties are a popular social experience for new (primarily freshman) students; they are also a common situation in which students find themselves making important sexual health decisions. The first page of the story would end with the main character agreeing to leave the party with the young man. A reader then could decide whether the couple went to The Original Hot Dog Shoppe (a local eatery called "The O" in the booklet) or to his room in the residence hall Litchfield Tower C (referred to as "Tower C"). Regardless of the reader's decisions, the story would always have the same ending: the main character meets her friends for breakfast at Pamela's Restaurant (a popular local restaurant) the next morning to discuss the previous night's events and the importance of being prepared for safer sex. The characters also briefly describe the sexual health resources available to University of Pittsburgh students, with the adjacent page listing additional information.

Figure 4 (see Appendix B) displays the various plot choices and storylines for the original narrative. As shown, the main character could still go home with her crush after eating at The O, or else decide to go home with some female friends to watch episodes of *Sex and the City* after her date. This rather mild plot choice was inserted both to balance the other, more intense storylines and to show the reader that young women can choose whether or not to engage in sexual activity. To further emphasize this point, the group mates presented the option for the main character to not have sex with her crush after she has gone to his room.

The storylines then showed two possible ways for the crush to react to her decision: positively (he respects and agrees with it) or negatively (he feels misled by the main character). While the group members wanted the story to present a scenario in which the crush is unhappy about not having sex, they did not want it to include a date-rape or other kind of sexual assault. They felt that such situations contradicted the material's sex-positive standpoint and could be misconstrued as unrealistic scare tactics or defamatory images of all young men as potential criminals. By having the crush just feeling misled and upset, the story would present both a realistic "negative" response to a refusal of sex and effective ways to manage such a response.

All possible storylines were written in the second person and began with the same scenario. Storyline options appeared at the bottom of the page, with instructions to turn to a specific page based on the desired plot choice. Vitriol, who designed the booklet's layout and color scheme, decided to use the page-turning instructions to inject some humor. Consequently, the reader had options such as "To revel in some sausage and eggs, turn to page 10."

Vitriol likewise designed the booklet to have greater visual appeal than most health education pamphlets. Its layout comprised colorful backgrounds, multiple font styles, and vibrant background shapes and borders. Figures 5 and 6 (see Appendix B) show the original booklet's front cover and beginning page, respectively. The group members called the booklet *Choose Your Own SEX Adventure* to gain readers' attention and somewhat parody the *Choose Your Own Adventure*® book series that inspired its creation. Several pages featured images that coupled illustrations imitative of the *Fun with Dick and Jane* children's book with suggestive subtitles or word balloons. This booklet would also be smaller than typical publications so that it resembled a "zine," a type of printed material typically outside of mainstream media.

Production of this health communication item posed several challenges. Vitriol had to arrange the booklet's pages within a Microsoft Word document such that they would fall in the appropriate order when folded and put together. The printing service also spent considerable time converting and reducing the Adobe PDF file of the booklet so it would be an accurate size for a "zine" once printed and cut. Finally, the booklet's colorful backgrounds and pictures made its printing time-consuming.

The group presented this booklet at the poster session for the final class session of Overview of Health Communication. They discussed the project's theoretical basis in the Health Belief Model (Champion & Skinner, 2008), primarily because the booklet demonstrated the various situations that a female student could encounter (perceived susceptibility) and modeled actions for female University of Pittsburgh students to promote their health (self-efficacy). If actually implemented, the group would develop booklets for other segments of the University of Pittsburgh student population, including heterosexual male students and the GLBT community. *Choose Your Own Sex Adventure* received overwhelmingly positive feedback from the course instructor, Tammy Thomas, MSW, MPH and the other students in the class.

4.2 TRANSITIONING FROM THE CLASSROOM TO THE CAMPUS

Colleagues outside the Overview of Health Communication class also appreciated the booklet's unique potential, which initiated the project's transition from a class assignment to a sexual health communication campaign. Rob Wilson, a Residence Director at the University of Pittsburgh, expressed interest in circulating the booklet to students living in the residence halls. Vitriol, Ferguson, and Londino agreed to develop the booklet into a health communication

project. Talmadge was no longer involved because she graduated in the 2009 spring semester. Wilson put the project team in contact with Jaime Sidani, PhD, MPH, CHES, a Health Educator at the University of Pittsburgh Student Health Services, to discuss a collaboration to improve the booklet and develop the project. Dr. Sidani offered to connect them to PantherWELL, a group of undergraduate peer health educators employed by the University of Pittsburgh that she supervised. PantherWELL could act as an advisory board to ensure the quality and accuracy of the storyline and booklet.

Dr. Sidani also advised changes to be made to the booklet prior to meeting with PantherWELL. Foremost, the project team had to completely change the booklet's back cover (which specifically reference University of Pittsburgh) because this project could not be officially connected to the institution. Dr. Sidani further requested that the pictures parodying *Fun with Dick and Jane* be removed, as they were copyrighted. She likewise observed that the title *Choose Your Own SEX Adventure* was too similar to the trademarked *Choose Your Own Adventure* title.

Dr. Sidani also pointed out a potentially serious issue with the booklet's front cover. In the 2008-2009 school year, a pro-life, pro-abstinence campaign distributed literature throughout the University of Pittsburgh campus that emphasized the many possible consequences of premarital sexual activity and contained inaccurate reproductive health information. The cover of this literature displayed images of broken hearts that were apparently quite similar to the one in Figure 5 (see Appendix B), the booklet's original front cover. This literature had been distributed at places frequented by undergraduate students such as the William Pitt Union, but none of the four original group members had seen it.

Because they did not want the booklet to be misconstrued as sex-negative or purveying inaccurate health information, the project team decided to change the front cover. They also did want to inadvertently promote unhealthy practices and so agreed to remove a joke about "pregaming" in the final part of the story. The term "pregaming" refers to "a risky drinking behavior that occurs when students drink before a primary social gathering or event" (Zamboanga, Schwartz, Ham, Borsari, & Van Tyne, 2010, p. 124). Although intended to add comic relief, this joke could potentially downplay the serious consequences of alcohol abuse. The story's other references to underage drinking were, however, acceptable since they emphasized the risky aspects of alcohol use, most notably when the main character simultaneously experiences a hangover and anxiety over having had unprotected sex.

The PantherWELL students likewise gave useful advice to make the story both realistic and to promote healthy behaviors. They pointed out that the main character did not demonstrate effective conflict management when she reacts to pressure from her crush to have sex. Originally, the main character angrily reprimands him for trying to convince her to have unprotected sex (promising to "pull out") and then storms out of his room shortly afterward. PantherWELL agreed that the main character should not have unprotected sex to appease her crush but felt that she "got mad too fast" and so appeared hostile and unstable rather than assertive and conscientious. Besides negatively portraying someone who acted responsibly, the scene just seemed unrealistic to the students. They agreed, however, that a scenario in which the crush becomes upset with the main character's decision to refuse sex was believable and necessary.

PantherWELL pointed out other "reality checks" for the story's details. Foremost, they thought that the story's beginning should provide more background on how the main character

knows her crush so that they could understand why she leaves the party with him. Many of the story's details also needed to be updated; for example, students typically did not frequent The O anymore. The booklet also needed changes to its layout and wording. Dr. Sidani pointed out that readers with limited literacy might not understand what it meant for the main character to "chat amiably" with her crush. The PantherWELL students meanwhile reported confusion at the writing style and also confirmed the project team's concerns that the pages with dark font against a darker background were difficult to read.

Ultimately, the PantherWELL students felt that the project would appeal to an undergraduate audience and help them to recognize the potential consequences of certain health decisions. They suggested adding information on some specific services (e.g. HIV oral rapid tests) offered at the Student Health Services and the price and availability of Emergency Contraception. Instructions on condom use likewise seemed appropriate to this booklet, and could replace the copyrighted pictures. The students further expressed interest in future stories written from other perspectives (e.g. that of a heterosexual male) and on other topics like the warning signs of date rape and the use of female condoms.

Feedback from Dr. Sidani and the PantherWELL students guided changes made to the booklet in August 2009. The project team first adjusted the color scheme so that the pages all consisted of white font against a dark background, or vice-versa. The patterns and color schemes on the front and back covers likewise became more subdued, though still visually appealing. Next, the story's writing style was simplified; for example, the couple chatted together "warmly" rather than "amiably." They then began to make the story details more realistic by referencing media and eateries that PantherWELL confirmed as popular with the target population. The

booklet's beginning page would also describe the main character's multiple platonic encounters with her crush prior to the party.

They next altered the storyline so that the characters modeled healthy behaviors when appropriate. The joke about "pregaming" was replaced with another one. When the main character's crush tries to convince her to have unprotected sex, she calmly responds that she does not feel comfortable doing so and will not be pressured into changing her mind. She becomes angry and storms out only after he implies that she "owes" him since she went home with him. Other changes presented opportunities to promote health education within the booklet. Following PantherWELL's advice, the project team replaced the copyrighted *Fun with Dick and Jane*-style pictures with step-by-step instructions on proper condom use. To maintain the booklet's humor element, these instructions were written from the perspective of the condom and appeared in word balloons alongside corresponding illustrations obtained from a health promotion website.

Changing the booklet's title to *Adventures in…SEX* allowed the project team to consider a series of booklets that covered various health topics relevant to the undergraduate student population (e.g. *Adventures in…ALCOHOL*). Figure 7 (see Appendix B) displays the new cover with its original "broken heart" symbol replaced by a shape that better resembles a story "bursting open," and a simpler (yet still appealing) color scheme. While the booklet's title change was an opportunity to expand health topics covered by the project, changes to its back cover helped the project team to increase the project's overall visibility and cultural relevance. In response to the undergraduate community's growing online presence, the project team decided to create an email account for the *Adventures in…* project (adventuresin.pitt@gmail.com) and a "Page" on the social networking website Facebook. The back cover instructed readers with a Facebook account to visit the project's Page to learn more about the project. This Page also listed

student events where the project team would distribute the booklets. Facebook users could also endorse the project by becoming Fans of its Page, and post their questions, comments and suggestions to the Discussion Board. Thus, both the email account and the Facebook Page gave the target population opportunity to communicate directly with the project team.

Because of its focus on STI and pregnancy prevention, the *Adventures in…* project became one of the projects of the Center for Maternal and Child Health Leadership in Public Health Social Work, for which Vitriol and Londino were Graduate Student Assistants (GSAs). They could consequently dedicate significant time each week to develop the booklet and prepare for its circulation. The first distribution occurred in late September 2009 at a health fair sponsored by University of Pittsburgh Student Health Services. Numerous male and female undergraduates took the black-and-white versions of the booklet (printed by the project team at the University computer labs), several students expressed interest in the interactive format, and a few male students asked for a story from a male perspective. The communication campaign's beginning thus appeared successful.

Vitriol met with PantherWELL several weeks following the health fair to discuss the current booklet and to consider potential storylines for future booklets. In that meeting, peer educators pointed out another potentially harmful practice in the story: unhealthy use of food. Although the original page-turning instructions (Ex. "To empower yourself with a peanut butter and banana sandwich, turn to page 10") had been intended to add humor to the story, the students pointed out that the main character using food (especially calorie-laden breakfast items) as a means of empowerment or reward did not demonstrate healthy nutrition practices. They suggested that the characters should instead meet for coffee so that the story's ending involved less food. As for future stories, they confirmed that the next one should be from a male

perspective and that subsequent stories should better emphasize the link between alcohol use and sexual health risks.

The project team again altered the booklet to fit PantherWELL's suggestions. An unnamed coffee shop replaced Pamela's Restaurant as the story's final meeting place so that the page-turning remained humorous (ie. "To revel in gossip and caffeine, turn to Page 10") while encouraging healthier behaviors. Figure 8 (see Appendix B) displays a diagram of the revised storyline. With the booklet finalized, the project team began planning with Dr. Sidani to recruit male undergraduate students to help write the next story. They also discussed potential grants to fund color printing of the booklets, as without financial backing the project team could offer the target population only black-and-white copies of the booklet (which strained the project team's student printing quotas and was an arduous process for the campus printers). Because of the approaching end to the semester, they decided to postpone any further project development until January 2010.

4.3 NEW DIRECTIONS FOR THE PROJECT

The 2010 spring semester presented several new challenges to the *Adventures in.*..project. Foremost, circumstances arose that limited the time that the project team could dedicate to its development. Ferguson, who had graduated the previous semester and relocated to another city, could no longer assist with creation or circulation. Meanwhile, grant renewal considerations caused the Center for Maternal and Child Health Leadership in Public Health Social Work to forego this project for those that more directly addressed maternal and child health. Vitriol and

Londino consequently had to set new objectives for that semester, as their GSA hours could not be used for any project-related activities.

They decided to focus on distribution of the current booklet, pursuing a copyright of the *Adventures in…* series, and planning preliminary project evaluation. Londino, who planned to use the project as her master's thesis topic, began to take greater responsibility over the project. She investigated the copyright process and the best means of evaluation, while Vitriol scheduled booklet circulation at two outreach events: a Student Health Services fair and the Campus Women's Organization's annual performance of *The Vagina Monologues*. Both events were scheduled during Sexual Responsibility Week, The BACCHUS Network's annual campaign to promote campus sexual health during the week of Valentine's Day.

Although inclement weather conditions caused the health fair to be cancelled and the performance rescheduled for March, the spring semester distribution proved successful. Numerous female students accepted the booklets. Further, several students recalled the project from the fall semester, indicating that the target audience indeed found the booklet memorable and interesting. Londino's literature review for the evaluation plan likewise indicated the project's uniqueness: while previous health interventions had utilized either narratives or interactive simulations, the *Adventures in…* project appeared to be the first to combine the two concepts specifically for health pedagogy.

Despite the project's unique nature, pursuing a copyright presented a challenge for the project team. The condom use illustrations used in the booklet were copyrighted images obtained from a website on public health services. Although these images could legally be used for a health communication campaign according to the Fair Use guidelines, the owners had to allow their use in another copyrighted material. Londino contacted the website proprietors in May 2010

and obtained permission to use the images. However, this approval was insufficient for the University of Pittsburgh because Londino planned to write her master's thesis on the *Adventures in…* project.

Consequently, Londino adapted the booklet again by replacing the condom application instructions with "An Interview with a Condom." This feature utilized word balloons to simulate a dialogue between an interviewer and a male condom that addressed the benefits and appropriate use of condoms. As shown in Figure 9 of Appendix B, "An Interview with a Condom" included a photograph of a condom (with a superimposed smiling face) along with the mock dialogue to maintain the *Adventures in…* project's practice of using humor to impart health information while also appealing to the target audience. Further, the project team could devise new "Interviews" to fit other stories and health topics.

Londino then researched United States copyright laws to ensure that the use of interactive fiction itself was not subject to copyright, as the continuation of the *Adventures in…* project depended largely on the ability to use that form of narrative. Because copyrights cannot extend to processes, ideas, and concepts (U.S. Copyright Office, 2008), Londino confirmed that her revised booklet aligned with copyright regulations. She then sent the revised material to the PantherWELL students for their review and critique. Many of the PantherWELL students were new peer educators who had not seen the booklet in the previous year. The material again received positive response, especially the "Interview with a Condom" feature, and was finalized in July 2010.

With Vitriol employed as a Health Educator at University of Pittsburgh Student Health Services, Londino expected to increase the booklets' circulation and outreach. However, administrative changes at Student Health Services caused most upcoming student programs and

health fairs to focus upon substance abuse issues rather than on sexual health topics. These program changes and her new work responsibilities caused Vitriol to continuously limit her role in the *Adventures in…* project such that by November 2010 Londino formally acquired full control over its development and direction. Although this situation delayed the project's development of new stories, formative research, and evaluation, it facilitated Londino's efforts to convert the project to one entirely Internet-based.

She had found ample evidence in the literature regarding the growing trend of seeking health information and support online (especially among young adults) and had further observed that undergraduate students now opted for website information rather than printed materials. By eliminating the need for printing, the project would become more environmentally and economically sustainable. Further, the conversion would amplify its potential reach, as numerous people could access a website link through media such as Facebook or emails. In September 2010, Londino used Google Sites to create a preliminary (i.e. "working model") website for the *Adventures in…* project. When the project began its online transition, its official website would offer the same content and follow the same structure as that presented through Google Sites.

The next month she met with a colleague and webpage designer to discuss the process and considerations for a full online conversion. Once Vitriol granted her permission to make the project Internet-based (granted in the form of full project control), Londino arranged with her webpage-designing colleague to build a better website and purchase a domain name in the 2011 spring semester. She also began contacting other student organizations and health educators at the University of Pittsburgh to expand the health topics covered and determine how to best market the website to the undergraduate student population. As the 2010 fall semester ended, preparations had been set to begin the next phase of the *Adventures in…*project.

5.0 DISCUSSION

5.1 APPLIED THEORIES AND PRINCIPLES

Health communication campaigns comprise multiple components such as message and material design, community collaboration, and strategic planning. While these components may overlap somewhat more in terms of similar action steps and theoretical considerations, they also can pull from wholly different models and require different inputs. Health communication designers and planners thus may have varying degrees of success in following best practices for each phase and effort in their overall project. The *Adventures in…* project experienced such variability, in that the design of the message and material demonstrated more successful application of principles than did the planning of the overall health communication effort.

5.1.1 Applied Health Education Theory Constructs

The booklet's storyline (the campaign's actual health message) significantly incorporated constructs from the Health Belief Model, Social Cognitive Theory, and the Integrative Model. It most strongly employed those of the Health Belief Model (its theoretical basis) and Social Cognitive Theory (from which the HBM derives one of its core constructs). Foremost, this material focused on addressing the target population's perceived susceptibility to the consequences of unsafe sex. Both PantherWELL and students in Londino's subsequent product

development sessions confirmed that the story featured realistic storylines and details. One female student even noted that the story's progression through a series of decisions demonstrated how quickly young women in college could find themselves in a compromising situation. Story details targeted to University of Pittsburgh-Main Campus students (e.g. Litchfield Tower C and the Freshman Studies class) further helped the readers to relate to the main character and see the storylines as situations that they themselves could encounter. The main character's anxiety in the scenario where she has unprotected sex also counters the issue of partner trust; although parts of the story portray the young man as highly desirable (and so not what young adults may consider "the type" to have an STI), she nonetheless recognizes the health risks associated with her unsafe sexual encounter.

The main character's feelings following unprotected sex also address the target population's concepts of the perceived severity of unsafe sex practices. Young populations tend to show greater concern for more immediate consequences (Nelson & Parvanta, 2011). An unprotected sexual encounter can result in negative feelings such as worry and regret, that is, serious potential psychological consequences which Richard, De Vries, and Van Der Plight (1998) call *anticipated regret*. Their study of young college students found that anticipated regret had significant influence on the participants' anticipated contraceptive uses during casual sex. Readers may further process the main character's regret because the story ends before she learns the results of her STI and pregnancy tests. Hoeken and van Vliet (2000) assert that unknown story outcomes can build a narrative's suspense. Besides concern for her health, the main character arguably experiences embarrassment over her poor decision since her hurried exit without waking the young man exemplifies "the walk of shame." Desire to avoid sexually-based

shame can be so potent that young adults will reference it to dissuade peers from risky behavior (Menegatos, Lederman, & Hess, 2010).

When the main character practices safer sex or decides to abstain, she benefits by avoiding these negative feelings. No consequences ensue when she decides to go home with friends after her date (such as the young man becoming upset at her departure), and she spends an enjoyable night with her girl friends. Using a condom in the "safer sex" scenario allows for the couple to focus on having a pleasurable experience. When the young man respects her decision to not have sex, they still spend an intimate time together. In the scenario where he becomes upset (which had to be included for purposes of skill-building and realism), the main character realizes that he is not so desirable after all. She further empowers herself by not succumbing to his pressure and also receives social support from her friends.

Her positive experience when practicing safer sex counters the notion that condom use diminishes sexual pleasure and "ruins the mood," two major perceived barriers of condom use. The main character likewise never feels embarrassment when requesting condom use or buying condoms. Purchasing sexual health products like condoms and Emergency Contraception actually becomes an activity that she does with her friends at the end of the story. Addressing the potential barrier of no social support thus also involves the Integrative Model's construct of perceived normative pressure, as the story portrays safer sex practices as the norm and ideal. Neither the main character's friends nor her crush try to dissuade her from safer sex. Indeed, when she requests that the young man use a condom, he willingly complies. Even in the scenario where the main character's crush becomes upset, his negative feelings are toward her refusal of sex, not her desire to use a condom.

The booklet also addresses the barrier of cost by listing multiple local resources that offer free or low-cost sexual health services both in the narrative and on its last page. It further counters potential psychological costs like embarrassment by describing sources of confidential STI testing and obtaining contraceptives without a prescription from a family doctor. These condom purchasing scenes can act as cues to action, since the main character stores her condoms in her purse so that she will always be prepared. Her actions to promote her sexual health throughout the story also build readers' self-efficacy through the principle of observational learning. Although not an actual role model story due to its fictional basis, characters similar to the target population nonetheless model positive behaviors. Even when the main character has made a poor sexual health decision by not using protection, she subsequently demonstrates healthy practices by scheduling STI tests and receiving Emergency Contraception. The story also builds positive outcome expectancies by showing the benefits of using condoms and of following one's preference to abstain. Finally, the main character practices self-regulation by setting sexual health goals (e.g. to buy Emergency Contraception and be more prepared in the future) and enlisting the social support of her friends.

5.1.2 Applied Principles of Health Communication Message and Material Design

The use of narrative conferred further benefit by creating a more appealing message than one found in a traditional didactic brochure. Through pretesting and collaboration with target audience members and other stakeholders, the project team created a realistic and culturally competent form of Entertainment Education that acknowledged and incorporated the accepted cultural mores and practices of the undergraduate young adult population. No attempts were made to dissuade the reader from casual sex or from attending parties, although the story did try

to subtly point out the potential sexual consequences of alcohol consumption. Through these targeted storylines and plot details, readers could better relate their own experiences to those of the main character.

Because of the interactive nature of this story, the readers essentially had responsibility for the main character's experiences and so had greater engagement than they would with traditional narratives. The use of present tense written in second person (temporal specificity and denotative specificity, respectively) created language immediacy that further held audience attention. This narrative also does not utilize qualifiers in its messages on sexual health. When the main character practices safer sex or chooses to abstain, she does not "maybe" benefit. She simply benefits. Similarly, in the scenario where she chooses unprotected sex, she definitely experiences anxiety and other negative feelings when she realizes her potential health risks.

The message thus used both gain-framed appeals (e.g. pleasure with condom use, empowerment from not succumbing to pressure for sex) to promote prevention behaviors and loss-framed appeals (e.g. anxiety over potential pregnancy and STIs) to promote STI screening. Its loss-framed component aligned with the Extended Parallel Process Model (Witte, 1997). A scenario that focused on emotional consequences like anxiety used minimal fear inducement to create a threat element. The main character then adds strong response efficacy and self-efficacy elements by recognizing her mistake, pursuing health screenings and Emergency Contraception, and acting to prevent future risky behaviors by purchasing condoms. Thus, the story overall maintained a positive and upbeat tone, with moderate humorous elements injected to create further appeal.

The booklet itself also followed the principles of creating effective and visually-appealing health communication materials. As indicated by feedback from the PantherWELL

peer educators and students who accepted distributed copies, it effectively utilized heuristic appeals and acceptable color schemes. Distributing black and white print versions of course diminished the booklet's visual appeal. However, the illustrations and color contrasts remained interesting. It likewise had a simple layout with appropriate margins, white space, and separation between paragraphs. All of the text was in sans serif font, adding to the booklet's "zine" style, as sans serif fonts are more modern (Ambrose & Harris, 2006). Although some wording and sentence structure needed revision, the story ultimately maintained a simple reading level. Information was also presented concisely, using vernacular terms like "birth control" and "Morning After Pill" rather than jargon like "oral contraceptives" and "Emergency Contraception." Further, no numerical data was presented except for the prices of sexual health services and resources. Table 1 (see Appendix C) lists how the *Adventures in…* project successfully applied best practices for designing health communication messages and materials.

5.1.3 Application of Planning Principles

Creating a story booklet that would have greater appeal than traditional health communication materials utilized many social marketing principles, especially the "4 Ps." Segmentation of the target population to focus on female students living on campus and beginning their undergraduate careers enabled the project team to use story details and situations that targeted the audience in a relevant and realistic manner. The project team wanted an honest presentation of "the product" (safer sex practices) and so showed both the benefits and costs of practicing safer sex; that is, insisting on safer sex can upset potential partners. However, experiencing such conflict to promote one's health was not portrayed as too great an emotional "price," but worrying about the consequences of unsafe sex was. Listing sources of low-cost sexual health

services and resources in a booklet distributed for free also emphasized the affordability of the product. The *Adventures in…* project also adhered to the concept of "place" by distributing at venues with a focus on sexual health or women's wellness. Finally, the project team actively sought "promotion" through its Facebook Page, which students and other Facebook users could utilize to learn about and endorse the project.

The project team applied several principles of strategic program planning. Although no written plans or objectives were created, except as part of the formal transition from project with the Center for Maternal and Child Health Leadership in Public Health Social Work to one done independently, the project team did have goals that it wanted to achieve. Specifically, the project team wanted to circulate the booklets at diverse student venues, create a booklet from the heterosexual young male perspective, and address other sexual health topics through further stories. To accomplish these desired outcomes, the project team members informally applied SWOTE considerations. They recognized the project's "weaknesses" in terms of no funding source and the limited time that each member could devote, and so tried to maximize available "strengths," which included their printing quotas as University of Pittsburgh students, free online promotion through Facebook, and their desire to develop the project. The unique potential of this type of communication effort was another perceived strength, and so the project team members sought out opportunities for new circulation venues and grant funding. They likewise took altered the materials to guard against threats to the project, such as having the material appear linked to a movement that did not favor comprehensive and sex-positive sex education.

They likewise wanted to maintain ethical outreach at all times, and so sought collaboration with stakeholders like Student Health Services and the Campus Women's Organization. Permission was obtained to circulate booklets at their events. Further, because the

booklet and overall project had the purpose of emphasizing personal autonomy while promoting healthy behavior, the project team willingly adapted the original booklet's storyline and content in response to stakeholder feedback. If necessary, the *Adventures in…* project would adapt its focus from sexual health topics to subject matter that better suited the perceived needs of the target population. However, both the literature and the stakeholders indicated a strong need for greater prevalence of safer sex practices on college campuses, so the original health focus seemed appropriate. Table 2 (see Appendix C) lists how the *Adventures in…* project successfully applied best practices for planning health communication efforts.

5.2 LESSONS LEARNED

The development of the *Adventures in…* project demonstrates the importance of flexibility in terms of both the health communication materials and the activities involved in the overall health communication effort. Greater strategic planning, though, could have perhaps circumvented some of the adjustments made throughout the project. This project's basis was a graduate class assignment which emphasized creation of a unique health communication material and gave a secondary focus to planning a program for the material's distribution. Consequently, when the project team had an opportunity to introduce its project to the target audience, there were no set objectives or any plans for its circulation or evaluation. They instead started the project with short-term plans for initial booklet improvement and distribution and intended to form more detailed long-term plans after gauging the target population's reaction to the material. The challenges that arose to the project in the 2010 spring semester do suggest that delaying their

development and outreach efforts to set more formal plans might have caused the *Adventures in…* project to never move beyond the original class assignment.

However, conducting an initial SWOTE analysis and creating more long-range plans would arguably have benefited the *Adventures in…* project. Analyzing the environment in terms of strengths, weaknesses, opportunities, and threats would have required the project team to recognize and plan responses for several issues that did arise, including the project team members' post-graduate commitment to the project and the impact of university-level administrative changes. They almost certainly would have made greater efforts to seek collaboration with other health-based organizations and student groups to increase the potential project development and sustainability. Lack of diverse stakeholder involvement definitely was another area of improvement, as partnering with other student groups (such as those with a health focus) would almost certainly have resulted in amplified outreach. Greater feedback and input could also have guided the project team in terms of what stories and health topics would interest the target population and promote their health and wellness.

Indeed, for the project team members to have followed best practices of health communication program planning, they should have conducted some degree of formative research. The PantherWELL students' significant health knowledge and positions with the University made them a non-representative sample of the University of Pittsburgh-Main Campus student population. Consequently, their assessment of the booklet's storyline and necessary health content may not reflect the desires of the target audience. Although the literature indicates strong evidence of the need for better sexual health education for the young female undergraduate population, the target population may have preferred materials focusing on other health topics, like avoiding unsafe alcohol use (though these two issues are strongly linked). The

project team would then have had the responsibility of responding to these expressed health concerns.

Formative research would have likely indicated the decreasing appeal of booklets and other paper-based communication within the target population. According to Parvanta and Parvanta (2011), communication and marketing endeavors must now utilize new technology-based media to appeal to audiences, especially young populations as they use multiple forms of these new media daily, including social networking websites, virtual reality, and mobile cellular phones and their applications or "apps." Subsequent project development conducted by Londino in the 2011 spring semester found that students prefer educators to "save the paper" and instead tell the students what website to visit. People in Generation Y (those between the ages of 18 and 28 years in 2008) and those in the younger generation, the Millenials, are currently the primary users of Internet media and other new media, despite accounting for about 70 million Americans (only 20% of the entire U.S. population) (Parvanta & Parvanta, 2011). In 2009, 93% of both of these generations utilized the Internet in some capacity (Lenhart, Purcell, Smith, & Zickuhr, 2010). Had the project team been aware of such preferences, it could have begun the online conversion much sooner and perhaps avoided the trouble of producing so many paper copies. An online format would also have provided a much less expensive means of presenting the material with color and other graphics to retain the visual appeal.

Evidence also suggests that a transfer to online format would increase the project's reach (see for instance Meier, Lyons, Frydman, Forlenza, & Rimer, 2007; Drost, Cuijpers, & Schippers, 2010; Parvanta & Parvanta, 2011). Once online, the *Adventures in…* project has the potential to gain publicity through viral marketing, the practice of encouraging people to send along advantageous or gripping information obtained from a hypermedia environment. The

presence and prevalence of instant communication methods such as email and text messaging make viral marketing of health messages promising. This form of marketing has already proven itself capable in the private sector, such as by rallying audiences to demand that the low-budget film *Paranormal Activity* be offered in more theaters (Parvanta & Parvanta, 2011). The Internet can also act as a crucial health resource, such that in 2005 approximately 80% of Internet users sought health information online (Meier et al., 2007). Young people have also demonstrated that they will utilize Internet-based health outreach (Markham et al., 2009; Drost, Cuijpers, & Schippers, 2010; Parvanta & Parvanta, 2011). For example, the website Survivalkid (located at the address www.Survivalkid.nl) targeted the adolescent children of mental health disorder patients to provide them with peer support, the chance to speak to a professional, and education on specific topics like domestic violence. Between June 2006 and June 2008, this website had 10,000 visits, a monthly average of 600 visits, and 397 adolescents at one point logged in (Drost, Cuijpers, & Schippers, 2010).

Technology-based forms of outreach also provide more privacy to the user. Some members of the target population may not have felt comfortable taking a paper booklet entitled *Adventure in…SEX* because of possible negative reactions from their peers. For example, during the first booklet distribution at the OHEP Kick-off, members of the project team observed one female student remarking that someone she knew would like the booklets because “she’s a slut.” Accessing online health information meanwhile can be done anonymously, especially now that some cellular phones (“smart phones”) offer Internet access. The confidentiality offered by online resources has been shown to facilitate health promotion (Markham et al., 2009; Beard et al., 2009; Drost, Cuijpers, & Schippers, 2010). Several regular users of Survivalkid reported that they appreciated how the website gave them opportunity to receive information and support

anonymously (Drost, Cuijpers, & Schippers, 2010). Participants in the "+Click" intervention likewise favored the "non-threatening" environment it created to obtain information about sensitive topics like condoms and contraception, and they reported having greater ability to discuss these topics with health professionals (Markham et al., 2009). Some health promotion activities can even be done totally in the virtual world: Accelerated Recovery Centers in Atlanta hosted an alcoholism recovery program entirely in Second Life that served over 100 people battling alcohol addiction (Beard et al., 2009). Thus, online resources present great opportunity for confidential and comprehensive health education and promotion.

6.0 CONCLUSIONS

6.1 THESIS SUMMARY

For many young adults, the transition from high school to college presents new freedom and opportunities to become sexually active (Lindgren et al., 2009b). The majority of U.S. college students engage in some form of sexual activity and many of these sexually active students do not consistently practice safer sex, with female students particularly vulnerable to such risk-taking (American College Health Association, 2010). Many factors encourage such risky sexual behaviors. The prevalence of Abstinence-only sex education (AOSE) curricula in schools has not delayed sexual activity in youth (Advocates for Youth, 2009) and instead seems to have just resulted in the students being less likely to utilize contraception and seek STI screening and treatment (Bearman & Brückner, 2001).

The college and young adult cultures also foster unhealthy sexual behaviors. “Serial monogamy” and the growing acceptance of casual sexual encounters result in young adults accumulating multiple sexual partners in relatively short time frames. These relationships also tend to not involve consistent condom use. Alcohol abuse, regarded by many students as an inherent part of college life (Menegatos, Lederman, & Hess, 2010), is strongly associated with risk-taking like unprotected sex (Corbin & Fromme, 2002) and casual sexual encounters (Downing-Matibag & Geisinger, 2009; Fielder & Carey, 2010), as well as the incidence of

coerced or unwanted sexual activity (Downing-Matibag & Geisinger, 2009; Novik, Howard, & Boekeloo, 2010). Mainstream mass media likewise encourage sexual activity without sexual responsibility (Brown et al., 2006), and often contain degrading images of women (Martino et al., 2006; Kim et al., 2007; Behm-Morawitz & Mastro, 2009; Yao, Mahood, & Linz, 2010). Exposure to such media has been linked to greater sexual activity in adolescents (Martino et al., 2006), poorer opinions of women's cognitive abilities (Behm-Morawitz & Mastro, 2009), and increases in young men's perceived likelihood of making inappropriate sexual advances (Yao, Mahood, & Linz, 2010).

Because of these unsafe sex practices, young adults and especially young women face serious risk of STIs and unplanned pregnancies. STIs and unplanned pregnancies (whether terminated or carried to term) present a range of physical ailments (Jones & Lopez, 2006; Heffner & Schust, 2010; Planned Parenthood Federation of America, 2011), financial burdens (Eshbaugh & Gute, 2008; Yeh, Hook, & Goldie, 2003; Jones & Lopez, 2006), and emotional consequences such as embarrassment and depression (Shrier, Harris, & Beardslee, 2002; Roberts, 2005; Royer & Zahner, 2009; Cheng et al., 2009; Charles et al., 2008; Hamama et al., 2010). However, unplanned and risky sexual activity can produce mental health issues like shame, regret, and emotional distress even when no physical consequences ensue (Eshbaugh & Gute, 2008; Fielder & Carey, 2010). Finally, practices in the college culture such as the emotional disconnect with casual sex and mixing alcohol with sexual encounters create an environment conducive for coerced sex and sexual assault (Downing-Matibag & Geissinger, 2009; Novik, Howard, & Boekeloo, 2010).

Young female college students thus face a myriad of physically and emotionally harmful sexual and reproductive health consequences. Strategically planned and conducted health

communication efforts may be an effective means to achieve the increased sexual health knowledge and improved attitudes toward safer sex needed to address these issues. Health communication pulls from various fields, including health education, mass communication, and program planning. A strong health communication campaign will have a solid basis in health education theory, a foundation in research, appealing and effective messages and materials, and strategic and organized action and evaluation plans.

To achieve these components, the health communication process should consist of several subplans, including the macro plan, strategic health communication plan, and implementation plan. Depicting these plans in a logic model can assist the organization and systematic review of a program (W.K. Kellogg Foundation, 2001). The PRECEDE-PROCEED model of program planning, with its individual phases targeted to assessment, intervention, and evaluation, can be particularly useful for planning health communication efforts (Gielen et al., 2008). Divided into eight phases, this model begins with assessing the target population's health needs, desires, knowledge, and skills (Gielen et al., 2008), preferably through collaborating with community members and stakeholders (Parvanta, 2011a).

Health communication planners should then conduct original or secondary research to determine key health issues and what environmental and behavioral factors impact them (Gielen et al., 2008). These environmental factors can be identified through conducting a SWOTE analysis. Community collaboration can assist in identifying strengths and weaknesses, avoiding threats, seizing opportunities, and ensuring that public health efforts are conducted in an ethical manner (Parvanta, 2011c). When planning these efforts, objectives should be set that follow SMART criteria (CDC, 2009a).

After setting their objectives, health communication planners next can decide what predisposing, reinforcing, or enabling factors to target. Health interventions that address these factors seek individual- or community-level behavior change and so could utilize constructs from behavior change theories. Many prominent theories in health behavior and health education closely relate to young adults' sexual health practices, especially the Integrative Model, Health Belief Model, and Social Cognitive Theory. Once the relevant theories have been identified, the health communication planners can select an appropriate intervention. These efforts often include small and mass media, which should be attractive with a convincing message. Visually appealing written materials will display vibrant, culturally acceptable color schemes, have ample white space, and use readable fonts (Ambrose & Harris, 2006; Thomas, 2009; Nelson & Parvanta, 2011). These materials will also take into account the target population's literacy and health literacy levels, and so utilize simple language that connects to the audience members and clearly instructs them on how to use the provided information (Parrott, 1995; Nelson & Parvanta, 2011; Parvanta, 2011b).

Health communication messages and materials should further be pretested with members of the target audience (Nelson & Parvanta, 2011; Parvanta, 2011b) to ensure that they are culturally competent, as culture has great impact on safer sex practices (Perloff, 2001; Schiavo, 2007). Formative research with the target population can also determine if the message and materials invoke the appropriate emotional responses to be convincing. Although fear appeals can be effective if they convince the audience members both that a threat exists and that they are capable of managing that threat, incorrectly designed fear appeals may be unsuccessful or even counterproductive (Hale & Dillard, 1995; Perloff, 2001; Parvanta, 2011b). Messages that

meanwhile establish positive affect, such as through humor or empathic responses, can also be effective at educating young adults about safer sex (Monahan, 1995; Perloff, 2001).

Besides creating an appropriate message, strategically conducted health communication efforts will deliver messages through media channels that appeal to the target audience (Schiavo, 2007). Because of the effect that mass media has on young adults' sexual health, many interventions addressing their risky behaviors employ Entertainment Education (EE) (Parvanta, 2011b). Entertaining narratives like role model stories and comic books have shown success at raising awareness of HIV/AIDS (Perloff, 2001; Lauby et al., 2000). Traditional narratives, though, have the audience play passive roles (Marsella, Johnson, & LaBore, 2003), while interactive fiction requires greater cognitive involvement from the reader. Technology-based interactive materials, such as Interactive Pedagogical Drama and other virtual world simulations, have had greater appeal to audiences than other forms of communication and successfully conveyed health information and promoted healthy behaviors (Marsella, Johnson, & LaBore, 2003; Beard et al., 2009; Parvanta & Parvanta, 2011).

Once the intervention is selected, it must be implemented. Social marketing, the application of commercial marketing principles to promote healthy behaviors, offers a useful strategy for implementing a health communication program (Butler, 2001). This process emphasizes the four "Ps" of marketing: Product, Price, Place, and Promotion as well as tactics such as audience segmentation and targeting (Parvanta, 2011a). Evaluations of the program's process, outcomes, and impact would then follow the implementation (Gielen et al., 2008).

The *Adventures in…* project began with a class assignment where four graduate students composed a health-based interactive fiction narrative in an attractive booklet as a novel means to educate young female college students about their sexual health risks and resources. Through

collaboration with stakeholders at the University of Pittsburgh-Main Campus, this booklet was adapted to be more culturally competent, fit the audience's literacy levels, and remain visually appealing without violating institutional policies or infringing on copyright. Pilot circulations to the target population were conducted and the booklets received positive initial responses and feedback. Administrative changes and other issues delayed further circulation, story creation, and project development, but also provided impetus to begin a full conversion to an Internet-based format.

This project's planning and designing team had varying levels of success at applying best practices to the health communication efforts. The booklet's storyline applied constructs from the Integrative Model, Health Belief Model, and Social Cognitive Theory. Its use of realistic and culturally relevant material in an interactive format facilitated audience engagement, and it maintained a positive tone even when covering scenarios with negative topics such as unprotected sex. The sentence structure and wording suited the target population's literacy levels, and the color scheme was readable and visually appealing even when printed in black and white.

Creating an appealing item facilitated using social marketing's "4 Ps." The project team offered an attractive product at no price in places where people interested in sexual health education would be. It further utilized opportunities like Facebook for product promotion to the target population. Although the project team set no formal objectives or plans nor conducted any detailed assessments, it nonetheless sought to amplify available program strengths and seize opportunities while addressing weaknesses and avoiding threats. Collaborating with community stakeholders helped the project team to avoid conflicts, identify opportunities for increased circulation, and follow ethical guidelines (e.g. creating an item that met target audience needs).

The *Adventures in…* project would however have benefited from the project team setting formal plans for program implementation and assessment. Events in the 2010 spring semester suggest that delaying the project's development and outreach efforts might have prevented it from ever moving beyond the original class assignment; nevertheless, creating detailed plans and objectives would almost certainly have caused the project team to prepare for some of the challenges that arose. More in-depth planning would probably have resulted in greater collaboration building too, which in turn could have increased outreach. Greater community involvement would further have provided more guidance on the health topics of interest to members of the target population and on the media channels that they prefer. Subsequent discussions with other University of Pittsburgh students and literature searches indicate the growing prominence of technology-based health communication and promotion, especially among the young adult population. Online features also offer better opportunity to confidentially present information and assistance and have greater overall reach.

6.2 PROJECT LIMITATIONS

Several limitations face the current *Adventures in…* project. By being targeted to the students at one urban university, the booklet may not match the interests and health concerns and needs of other undergraduate female populations, even after removing all details specific to the University of Pittsburgh-Main Campus. The small scope of the pilot circulation (due to limited partnership and stakeholder involvement) likewise calls into question the appeal of this booklet to the general female undergraduate population at University of Pittsburgh-Main Campus. Without appropriate levels of formative research, it is uncertain whether such materials would actually

appeal to the wider target audience. Similarly, the *Adventures in…* project must eventually include evaluation of the story's didactic capabilities, as an attractive health communication material still falls short if it does not raise awareness or increase knowledge.

As a paper-based narrative, the booklet itself presents inherent outreach challenges. The reach of paper materials is limited both by the number of copies available and whether people in need of the messages will be at one of the circulation venues. Such materials can contain only a moderate amount of information while remaining a manageable size. Sexual health outreach to the undergraduate population, meanwhile, involves multiple topics. Indeed, the current storyline did not touch upon a number of relevant health topics, including condom negotiation, STI transmission during oral sex, and the issue of serially monogamous relationships. Health narratives in any format are essentially limited by length constraints. Further, presenting relevant information such as STI severity and prevalence in the young adult population in a realistic and entertaining manner can be quite challenging. The story has to impart the seriousness of the condition without seeming like the scare tactics used in "health terrorism."

A narrative, that is, a material utilizing observational learning, may not be sufficient for behavioral change. The target population may require more direct help such as through skills training or being given resources like free condoms. Similarly, individual-level interventions can produce a finite level of results. Behavior change efforts can be inhibited by institutional policies or other external forces that are not conducive to the adoption of these healthy behaviors (e.g. restrictions on the sale of condoms and other contraceptives).

6.3 RECOMMENDATIONS

The *Adventures in…* project's continued development requires covering more health topics and expanded outreach to the target population. To cover more health topics, new stories should be created, as a series of small entertaining narratives, each covering a different health topic will facilitate the reader's ability to attend to the message. New features, such as additional "interviews" with other health-related materials, could accompany these stories to further build reader skills and raise awareness. Because of the link between other health concerns and sexual health (e.g. drugs and alcohol and self-esteem issues), the project should focus on expanding beyond sexual health. Expanding the topics covered would also likely draw in more members of the target audience, as those who do not perceive need of sexual health information may instead seek the project's materials covering other topics that interest them. These individuals may then view the sexual health-related stories out of curiosity, or at least seek it out when they do perceive a need for it. Similarly, any project that strives to improve undergraduate sexual health cannot adequately do so without targeting the entire population. Therefore, the project team must write stories from the perspectives of other undergraduate subpopulations (e.g. heterosexual male students and students in the GLBTQ community). Outreach must also occur with other undergraduate student populations besides those of the University of Pittsburgh.

Such increased outreach necessitates greater stakeholder involvement and more collaboration with other relevant organizations. The project team should pursue partnerships with stakeholders such as other student groups, other university personnel, and health- and community-based agencies to facilitate the development and formative evaluation of culturally competent materials that respond to the target population's needs and interests. Besides seeking the relevant health topics, the formative research should also examine the format in which the

target population would prefer to receive health communication. While the literature and feedback from students aiding in project development provide support for the *Adventures in…* project's conversion to online format, feedback from representative target population samples should echo this sentiment.

An online format however offers multiple advantages for this project. Foremost, eliminating paper materials makes the project more sustainable economically, as the price to maintain a website is typically much less than the cost of mass-producing booklets and other handouts. New interactive stories, features, and other health-related information can be added quickly to a website and existing project materials can have their information and story details updated, all at no additional cost. Outdated paper materials meanwhile must be replaced with updated versions, a process that could quickly deplete both financial and environmental resources. Online communication can also be viewed by anyone with access to the Internet, a population rapidly growing thanks to the advent of smart phone technology. A project website can further contain links to the websites of other health resources, accelerating the process of target population members obtaining needed information and other assistance.

Besides amplifying the project's potential outreach, an online format could also promote its evaluation. Monitoring visits to the website can be a useful means of assessing its appeal to the target population. Responses to an anonymous quality-control survey posted on the website likewise could indicate the project's level of appeal. The narratives' didactic capabilities could also be assessed with this online format. Research participants could be assigned usernames and passwords to log into the website, respond to a pre-test on their existing attitudes and practices regarding safer sex, and then complete follow-up post-tests on these subjects after visiting the website and viewing its stories and other features.

The health communication efforts also need to be strategically planned in order to be successfully implemented and evaluated. Based on the needs of this project, the PRECEDE-PROCEED model (Gielen et al., 2008) offers a useful means of program planning. While formative research occurs with the health communication materials, the project team can perform a SWOTE assessment of possible outreach sites. With the information they gather on the positive and negative factors facing the outreach efforts, they must set objectives that adhere to the SMART criteria. For example, a reasonable objective (depending on the SWOTE assessment) could be to distribute project materials at five student events in one semester.

The project team should organize all desired actions and existing resources into a logic model to determine that they have the resources to achieve these objectives. Figure 10 (see Appendix D) shows a potential logic model for some of the *Adventures in*…project's outreach efforts. Such a model would facilitate program evaluations that must be a part of any health communication effort. Consequently, once the project has expanded its outreach and covered more topics, the project team must assess its process and outcomes. The process evaluation can be a straightforward examination of the project's visible efforts, such as whether it reached the desired number of audience members and covered the set health topics. Outcome evaluation, meanwhile, will require assessing whether the narrative has any effect on the target population's existing health attitudes and behaviors. An impact evaluation however would not be possible, as so many factors affect undergraduate health (especially their sexual health) that to attribute any changes specifically to the project's efforts would be inappropriate.

To achieve its desired outcomes and impact, a health communication effort must have adequate resources. Collaboration with other groups and agencies could provide the project with financial resources that would fund project activities like the development of new narratives,

outreach efforts, and distribution of materials conducive to healthy behaviors (e.g. free condoms). Their support could also lend credibility to the project as a trustworthy source of information. However, project sustainability requires that the *Adventures in…* project seek its own resources and build its own reputation, either through grant funding or support from a private institution, nonprofit or commercial. Given the growing popularity of simulation and health promotion materials in the commercial sector, there could be opportunity for the project to gain such investment.

6.4 FINAL THOUGHTS

Young undergraduate female students frequently engage in unsafe sexual practices that can result in significant repercussions to their physical and mental health and also impede their education and quality of life. Some of these poor decisions arise from social practices in the student culture that promote multiple sexual partners in short time spans, unprotected sex, and other risky behaviors. However, other factors lie beyond these students' personal control. Inadequate sex education in schools arises from policymakers' political and moral agendas, while economic interests spur the mass media's continuous peddling of misinformation regarding sex and sexual health and responsibility. All of these factors merge to create an environment in which young women suffer significant morbidity from STIs, unplanned pregnancies, and psychological detriments.

These issues pose serious implications for maternal and child health and for overall societal welfare. Therefore, sexual health education and awareness-raising for this population must be enhanced. These efforts can face difficulties such as the target population's disinterest

and desensitization to warnings of health consequences. Novel and entertaining forms of health communication may be a key means of overcoming these barriers. Adolescents already utilize popular media to garner information about sex and other topics, and the growing prominence of video games and other simulations demonstrates this population's preference for control. Interactive fiction, in which the reader simultaneously affects the storyline and observes the main character's actions, melds the active cognitive process of simulation with the practice of observational learning to create a mental status amenable to health learning. If available in a format visually appealing and easily obtainable, interactive health fiction narratives could quite possibly change the target population's attitudes, raise their awareness, and increase their health knowledge.

The *Adventures in…* project thus should continue its outreach efforts to the undergraduate female student population while also seeking further development to appeal to a larger audience and cover further topics. Undergraduate students are adults with unique preferences and desires who are capable of making their own health and life decisions. To effectively reach this population, health communication efforts must recognize and respect their autonomy and try to appeal to them on their terms. Through such efforts, young undergraduate women may be empowered to make decisions toward better physical and emotional health for the present and future.

APPENDIX A

UNDERGRADUATE SEXUAL HEALTH STATISTICS

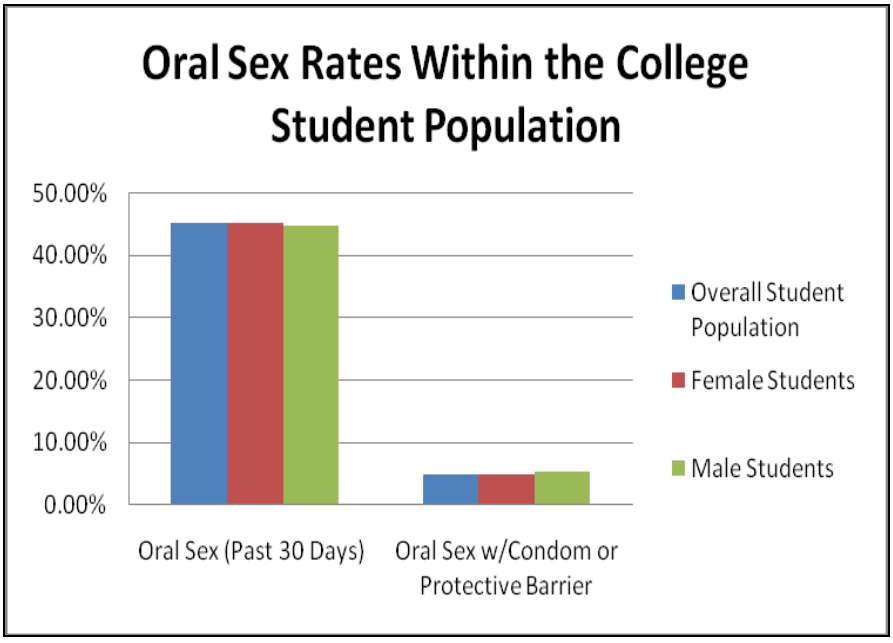

Figure 1. Oral Sex Rates Within the College Student Population (American College Health Association, 2010).

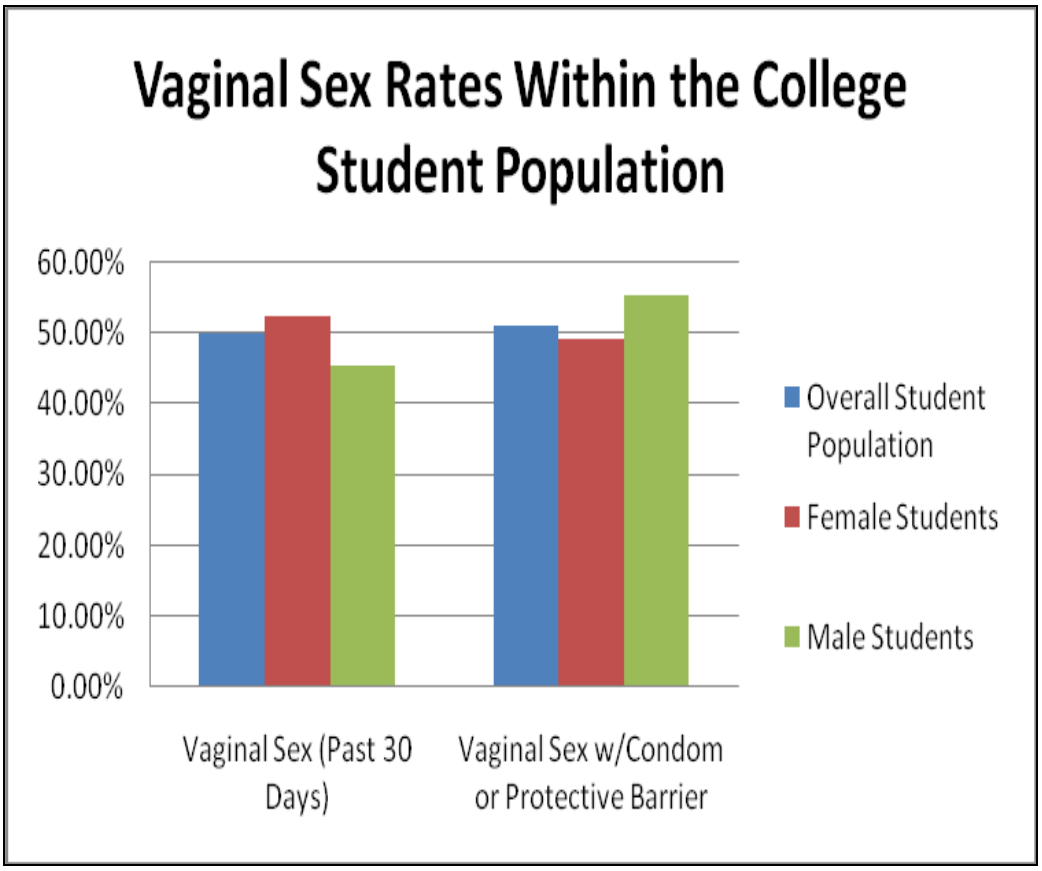

Figure 2. Vaginal Sex Rates Within the College Student Population (American College Health Association, 2010)

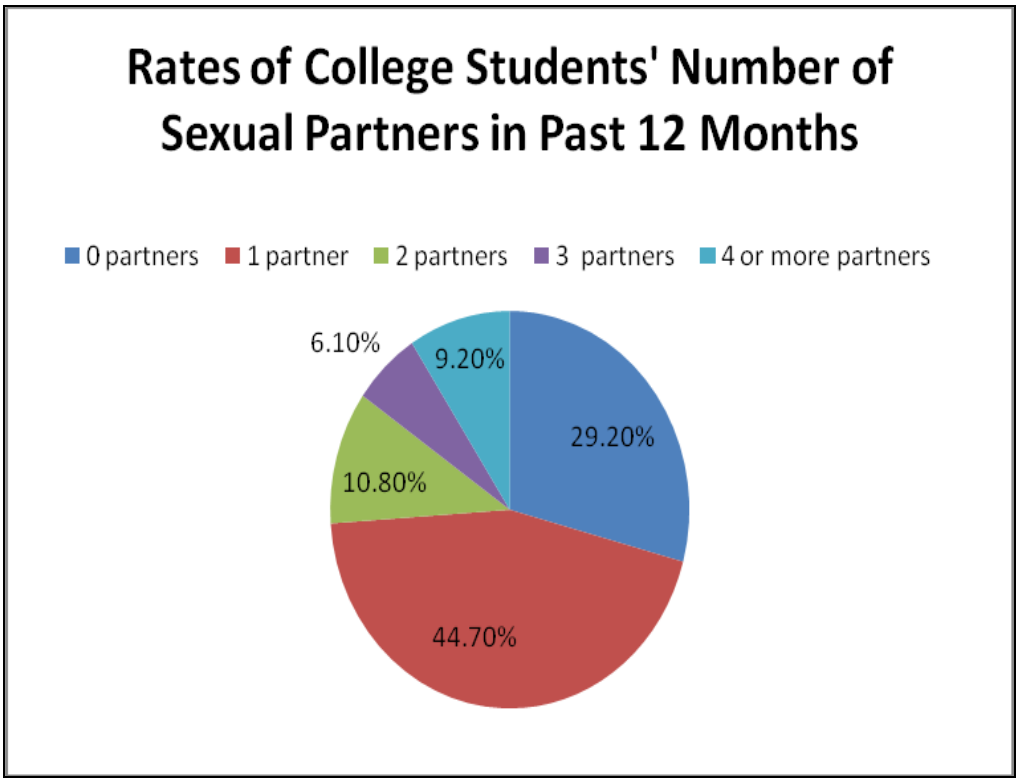

Figure 3. Rates of College Students' Number of Sexual Partners in Past 12 Months (American College Health Association, 2010)

APPENDIX B

PROJECT DEVELOPMENT FIGURES

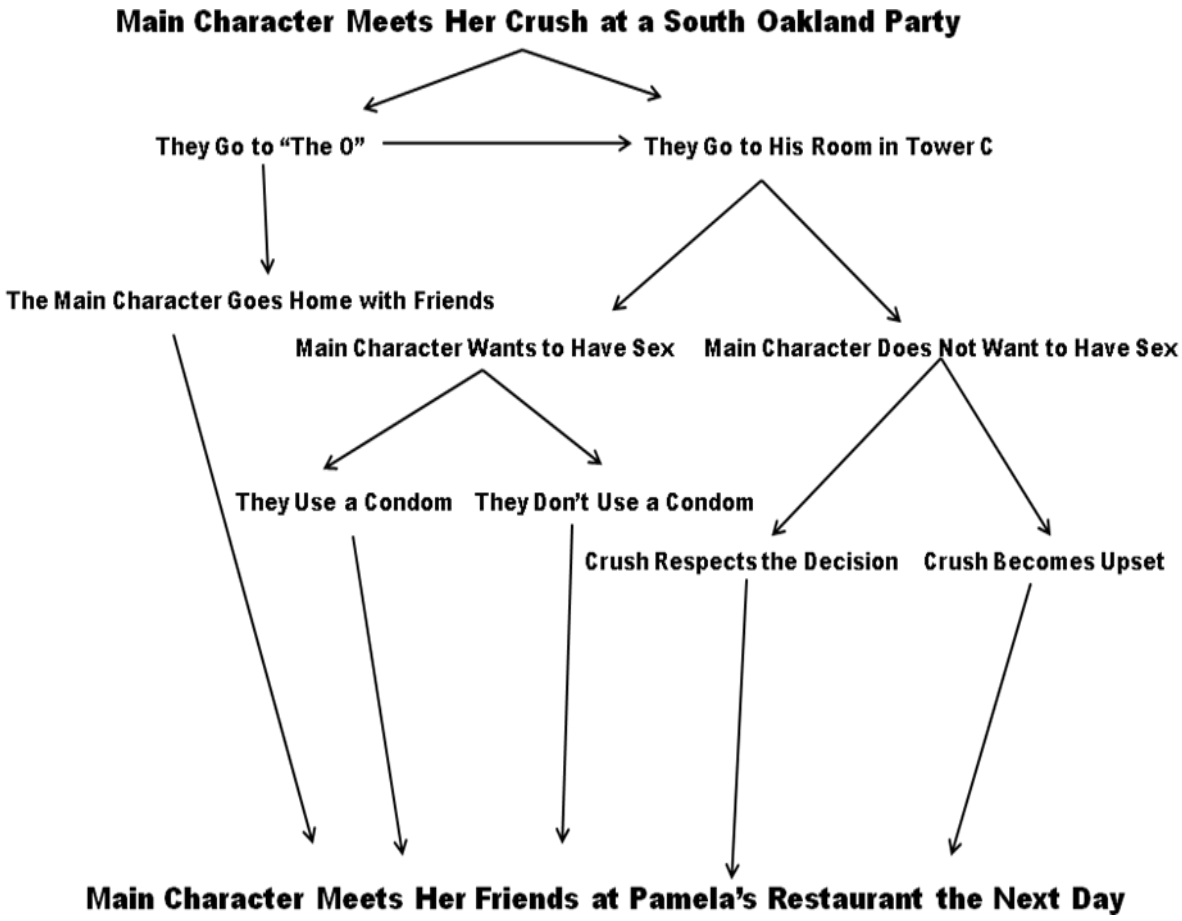

Figure 4. Outline of the Booklet's Original Plot Choices and Storylines

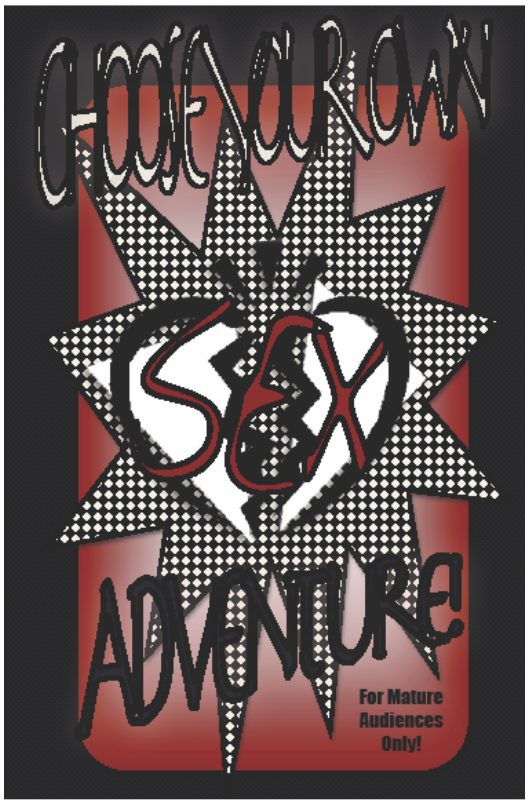

Figure 5. Front Cover of the Original Booklet

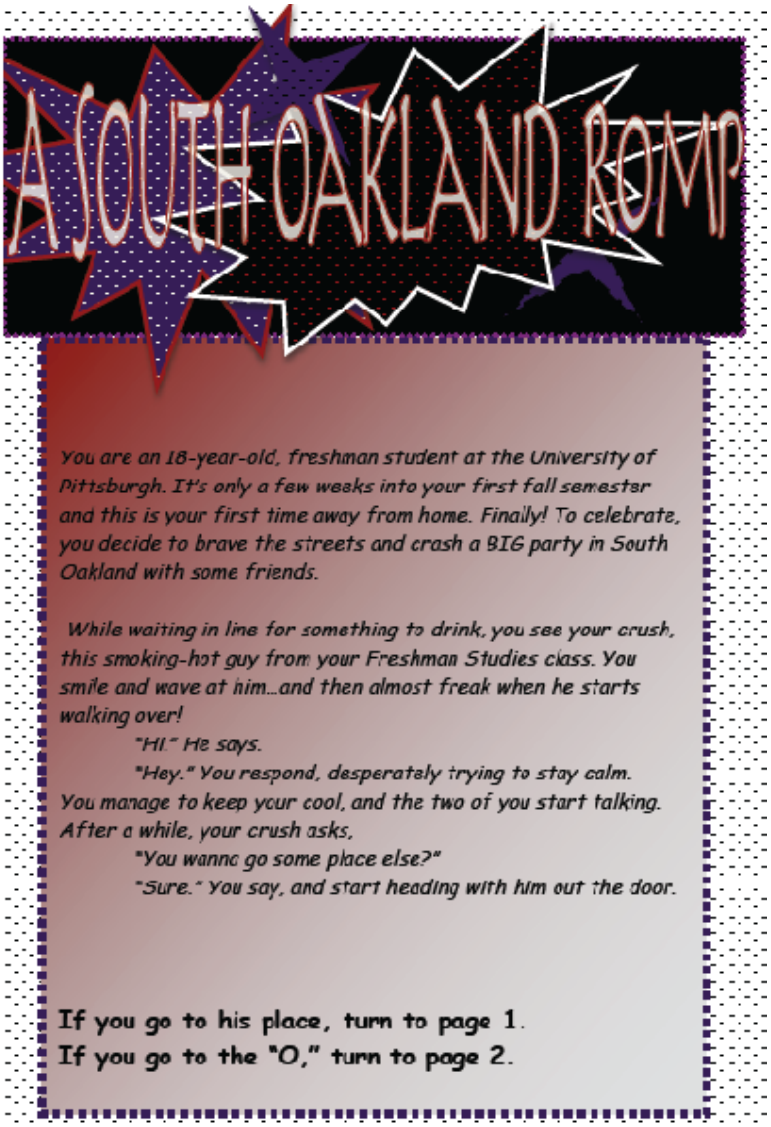

Figure 6. Beginning Page of the Original Booklet

Figure 7. Revised Booklet Cover with New Title

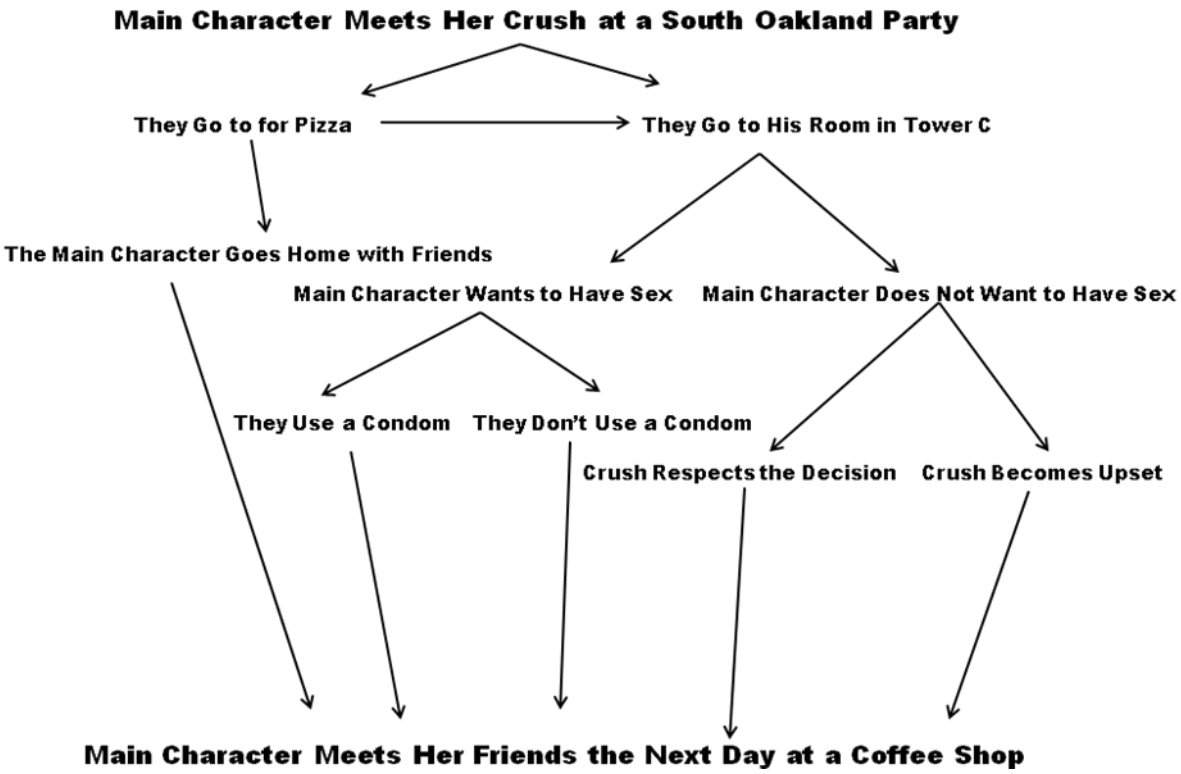

Figure 8. Outline of the Booklet's Revised Plot Choices and Storylines

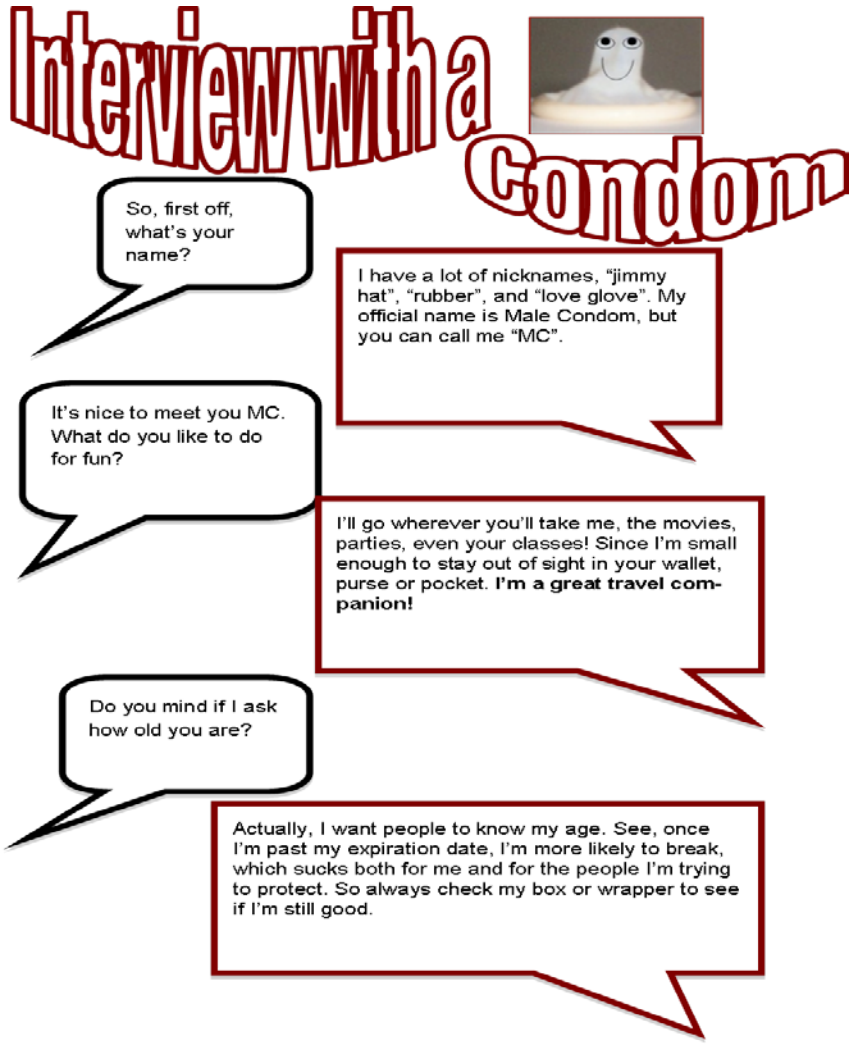

Figure 9. Portion of "Interview with a Condom"

APPENDIX C

HEALTH COMMUNICATION DESIGN AND PLANNING TABLES

Table 1. Project Application of Health Communication Best Practices for Product Design

Health Communication Best Practices for Product Design	**Project Application**
Employ health education theory in the design	**Health Belief Model constructs:** perceived susceptibility (story had realistic scenarios) perceived severity (presented relevant consequences like regret, shame, and anxiety) perceived benefits (safer sex practices prevent negative consequences and are supported) perceived barriers (condom use does not inhibit pleasure or offend the partner; affordable and confidential resources are listed) cues to action (condoms stored in purse for future preparation) **Social Cognitive Theory constructs:** self-efficacy (characters similar to the audience practice safer sex) self-regulation (main character sets safer sex goals and enlists social support) outcome expectancies (safer sex practices yield positive results) observational learning (characters model appropriate behaviors) **Integrative Model constructs:** perceived normative pressure (main character never discouraged from practicing safer sex)

Table 1 Continued

Garner audience attention	Offered an entertaining, interactive story narrative Written to create language immediacy
Demonstrate cultural competence	Narrative included typical college practices such as casual sex and attending parties
Employ gain-framed and loss-framed appeals	Gain-Framed: Pleasure with condom use; empowerment from avoiding unsafe sex Loss-Framed: Anxiety over potential pregnancy and STIs; The embarrassing "walk of shame"
Include efficacy elements with threat elements in fear appeals	Unprotected sex scenario included: response efficacy (obtaining Emergency Contraception) self-efficacy (main character pursues screening and treatment and prepares to practice safer sex in the future)
Mind audience's literacy levels	Contained simple wording and sentence structures Avoided jargon (Morning After Pill rather than Emergency Contraception) Offered minimal numerical data (Prices of sexual health services and resources) Material had appropriate layout (Margins, white space, and separation between paragraphs)
Create a positive affect	Storyline maintained an overall upbeat tone (Story ends with a pleasant time with friends) Included humorous features (Amusing page-turning instructions; Interview with a Condom)
Present visually-appealing materials	Utilized heuristic appeals (vibrant graphics) Maintained an acceptable color scheme

Table 2. Project Application of Health Program Planning Best Practices

Health Program Planning Best Practices	**Project Application**
Employ social marketing principles	**Utilized the four "Ps:"** Product (Created an appealing material; the benefits and costs of safer sex were honestly portrayed) Price (Costs of safer sex did not appear serious; low-cost sexual health resources listed) Place (Materials distributed at venues relevant to sexual health and women's issues) Promotion (Utilized Facebook to increase its publicity and relevance) Audience segmentation (Focused on young heterosexual females in the undergraduate population) Targeting (Created a material specifically intended for the target population)
Have program objectives	**Created rudimentary objectives for development and distribution:** Development (Create stories on other sexual health topics; Write stories from other perspectives) Distribution (Circulate at as many student venues as possible)
Conduct a SWOTE analysis	**Project team informally identified strengths, weaknesses, opportunities, threats, and ethical considerations:** Strengths (Printing quotas; Desire to develop the project) Weaknesses (No funding source; Limited time for project development) Opportunities (Circulation venues; Grant funding opportunities) Threats (Potential confusion with sex-negative campaigns) Ethical Considerations (Ensured that the material did not promote unhealthy behaviors; Collaborated with community members and stakeholders)
Collaborate with community and key stakeholders	Obtained permission to circulate at venues Adapted the booklet per stakeholder feedback Focused on health topics relevant to stakeholders

APPENDIX D

FIGURES RELEVANT TO PROJECT RECOMMENDATIONS

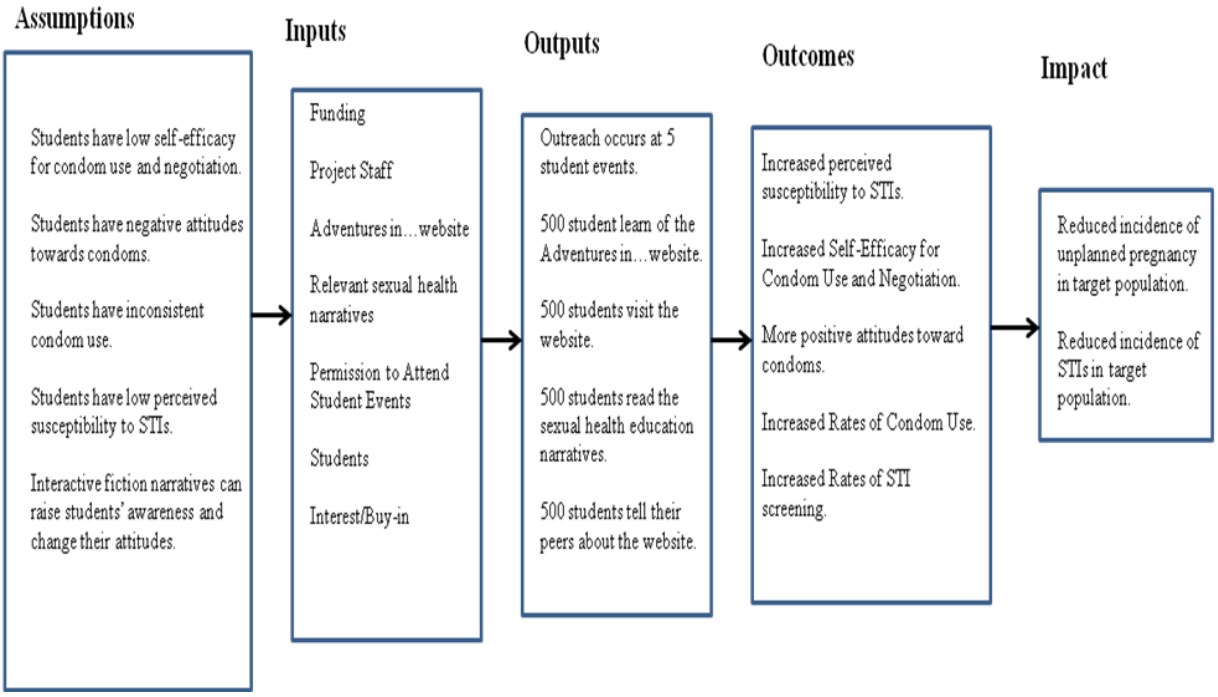

Figure 10. Possible Logic Model for Future Outreach

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