The Role of Mass Media Related Risk Factors in Predicting Sexually Risky Intentions and Behaviors Among Adolescents: A Model of Sexual Risk Taking

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THE ROLE OF MASS MEDIA RELATED RISK FACTORS IN PREDICTING SEXUALLY RISKY INTENTIONS AND BEHAVIORS AMONG ADOLESCENTS: A MODEL OF SEXUAL RISK TAKING

BY

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A Dissertation submitted to the Department of Computer Science in partial fulfillment of the requirements for the degree of Doctor of Philosophy

Degree Awarded: Spring Semester, 2011
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I dedicated this to my family.....
ACKNOWLEDGEMENTS

This dissertation was made possible through the use of the Teen Media Survey data and I express my gratitude to Dr. Jane Brown who directed me to the survey data.

I would like to thank Dr. Gary Heald whose patience and expertise helped me to overcome obstacles throughout my graduate studies and dissertation. This dissertation would not have been possible without him. His insight into interdisciplinary research and his exceptional teaching have challenged me to expand my understanding of communication theory and research methods. I am also grateful for the moral support and availability throughout the dissertation. Thank you for everything you have taught me about myself, school, career and life.

I would like to acknowledge Dr. Eberstein who helped me understand and recognize the importance of interdisciplinary research. He has challenged me to look at communication phenomenon as part of a larger web of variables explaining human behavior and his teaching has inspired me to look beyond what is apparent.

I would also like to thank my family (Ma, Baba, Tirtho) for their love and patience. A special thanks to Daniel for his love, humor and optimism. To you all, I dedicate this dissertation.
# TABLE OF CONTENTS

List of tables.......................................................................................................... vii
List of figures........................................................................................................... xi
Abstract................................................................................................................... x

## INTRODUCTION

General Considerations.......................................................................................... 1
Problem Statement.................................................................................................... 2
Purpose and Organization......................................................................................... 4
  Purpose of the Study.............................................................................................. 4
  Organization of the Study...................................................................................... 4

## LITERATURE REVIEW

Trends in Adolescent Risky Sexual Behavior, STIs and STDs................................. 7
  Risky sexual behaviors among adolescents......................................................... 7
  STIs and STDs trends among adolescents............................................................ 8
    Chlamydia............................................................................................................ 9
    Gonorrhea.......................................................................................................... 9
    Human Papillomavirus....................................................................................... 9
    Human Immunodeficiency Virus...................................................................... 10
  Summary.............................................................................................................. 10

Health-Related Theories and Models.................................................................... 12
  The health belief model...................................................................................... 12
  Protection motivation theory................................................................................ 13
  Theory of reasoned action and theory of planned behavior............................. 13
  Social cognitive theory........................................................................................ 14
  Multiple domain model....................................................................................... 14

Recurring Traditional Risk Factors in Health-Related Models............................ 15
  Risk-related attitudes........................................................................................ 15
  Perceived norms................................................................................................. 16
  Self efficacy......................................................................................................... 17
  Sensation seeking and impulsive decision making............................................ 18
  Summary............................................................................................................. 19

Media Theories and Review of Media Related Risk Factors............................... 20
  Overview of mass media theories and research............................................... 20
    Cultivation theory............................................................................................. 21
    Social cognitive theory...................................................................................... 21
    Disinhibition theory......................................................................................... 22
    Super-peer theory............................................................................................ 22
  Media-related risk factors.................................................................................. 23
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Television availability and adolescent usage</td>
<td>24</td>
</tr>
<tr>
<td>Television contents</td>
<td>25</td>
</tr>
<tr>
<td>Television exposure effects on adolescents</td>
<td>26</td>
</tr>
<tr>
<td>Movies availability and adolescent usage</td>
<td>26</td>
</tr>
<tr>
<td>Movie contents</td>
<td>27</td>
</tr>
<tr>
<td>Movies exposure effects on adolescents</td>
<td>27</td>
</tr>
<tr>
<td>Internet availability and adolescent usage</td>
<td>28</td>
</tr>
<tr>
<td>Internet contents</td>
<td>28</td>
</tr>
<tr>
<td>Internet effects on adolescents</td>
<td>29</td>
</tr>
<tr>
<td>Music availability and adolescent usage</td>
<td>29</td>
</tr>
<tr>
<td>Music content</td>
<td>29</td>
</tr>
<tr>
<td>Music effects on adolescents</td>
<td>30</td>
</tr>
<tr>
<td>Music videos availability and adolescent usage</td>
<td>30</td>
</tr>
<tr>
<td>Music video contents</td>
<td>30</td>
</tr>
<tr>
<td>Music video exposure effects on adolescents</td>
<td>31</td>
</tr>
<tr>
<td>Perceptions of mass media messages</td>
<td>32</td>
</tr>
<tr>
<td>Summary</td>
<td>33</td>
</tr>
<tr>
<td>Co-occurrence of Media Related Factors and Established Risk Factors</td>
<td>35</td>
</tr>
<tr>
<td>Media exposure and risk related sexual attitudes</td>
<td>35</td>
</tr>
<tr>
<td>Media exposure and perceived sexual norms</td>
<td>35</td>
</tr>
<tr>
<td>Media exposure and sexual self efficacy</td>
<td>36</td>
</tr>
<tr>
<td>Sensation seeking and media exposure</td>
<td>36</td>
</tr>
<tr>
<td>Sensation seeking and perception of media messages</td>
<td>37</td>
</tr>
<tr>
<td>Intentions and actual behaviors</td>
<td>37</td>
</tr>
<tr>
<td>Summary and conclusions</td>
<td>39</td>
</tr>
<tr>
<td>Study Hypotheses and Proposed Model</td>
<td>40</td>
</tr>
<tr>
<td>METHODOLOGY</td>
<td>44</td>
</tr>
<tr>
<td>Background</td>
<td>44</td>
</tr>
<tr>
<td>Sampling Frame and Data Collection</td>
<td>44</td>
</tr>
<tr>
<td>Measurement of Variables</td>
<td>45</td>
</tr>
<tr>
<td>Impulsive decision making</td>
<td>46</td>
</tr>
<tr>
<td>Sensation seeking</td>
<td>47</td>
</tr>
<tr>
<td>Mass media exposure</td>
<td>47</td>
</tr>
<tr>
<td>Perceptions that media messages encourage sexual behavior</td>
<td>49</td>
</tr>
<tr>
<td>Permissive attitudes regarding sex</td>
<td>49</td>
</tr>
<tr>
<td>Perceptions of peer norms that are risky</td>
<td>50</td>
</tr>
<tr>
<td>Sexual self efficacy</td>
<td>51</td>
</tr>
<tr>
<td>Sexual intentions that are risky</td>
<td>52</td>
</tr>
<tr>
<td>Sexual behaviors that are risky</td>
<td>52</td>
</tr>
<tr>
<td>Statistical Procedures</td>
<td>53</td>
</tr>
</tbody>
</table>
RESULTS .................................................................................................................. 57
Sample Demographics of Survey Respondents .............................................. 57
Descriptive Analysis of Study Indices .............................................................. 58
Fit Indices and Hypothesis Testing ................................................................. 59
  Fit indices ........................................................................................................ 59
  Hypothesis testing .......................................................................................... 62
    Proposition 1 ............................................................................................... 66
    Proposition 2 ............................................................................................... 66
    Proposition 3 ............................................................................................... 67
    Proposition 4 ............................................................................................... 67
    Proposition 5 ............................................................................................... 68
    Proposition 6 ............................................................................................... 69
    Proposition 7 ............................................................................................... 69
Exploratory Analysis: Gender Differences ...................................................... 72
  Descriptive analysis of study indices by gender subsample ....................... 72
  Fit indices between the gender subsamples ................................................. 76

DISCUSSION .......................................................................................................... 79
Overview of the Study ....................................................................................... 79
Implications for Interventions ......................................................................... 82
Limitations of the Study and Directions for Future Research ...................... 83

APPENDICES .......................................................................................................... 86
Appendix A- Questionnaire Items ................................................................. 86
Appendix B- Human Subjects Approval ......................................................... 97
LIST OF TABLES

Table 1 Teen Media Health Survey: Baseline and Follow-up Demographics for Sample Respondents Used to Test the Risky Sexual Behavior Model 57

Table 2 Chronbach’s Alpha Reliability Measures for Predictor and Predicted Indices in the Risky Sexual Behavior Model 58

Table 3 Descriptive Statistics for Predictor and Predicted Indices in the Risky Sexual Behavior Model 59

Table 4 Pearson’s Correlation Coefficients for Predictor and Predicted Indices in the Risky Sexual Behavior Model 60

Table 5 Goodness of Fit Indices for the Original and the Revised Risky Sexual Behavior Model 62

Table 6 Unstandardized (B) Path Analysis Coefficients and (Standard Errors) for the Original Hypothesized Risky Sexual Behavior Model 63

Table 7 Unstandardized (B) Path Analysis Coefficients and (Standard Errors) for the Final Revised Hypothesized Risky Sexual Behavior Model 64

Table 8 Standardized (β) Path Analysis Coefficients and (Standard Errors) for the Final Revised Risky Sexual Behavior Model 65

Table 9a Descriptive Statistics for Predictor and Predicted Indices in the Risky Sexual Behavior Model, Subsample Males 73

Table 9b Descriptive Statistics for Predictor and Predicted Indices in the Risky Sexual Behavior Model, Subsample Females 73

Table 10a Pearson’s Correlation Coefficients for Predictor and Predicted Indices in the Risky Sexual Behavior Model, Subsample Males 75

Table 10b Pearson’s Correlation Coefficients for Predictor and Predicted Indices in the Risky Sexual Behavior Model, Subsample Females 75

Table 11 Goodness of Fit Indices for Revised Risky Sexual Behavior Model Comparing Subsamples, Males vs. Females 76

Table 12 Standardized (β) Path Analysis Coefficients and (Standard Errors) for the Risky Sexual Behavior Model, Subsample Males vs. Females 78
LIST OF FIGURES

Figure 1  Hypothesized risky sexual behavior model: Influence of media related risk factors and other established risk factors on sexually risky behaviors………  43

Figure 2  Revised risky sexual behavior model: Unstandardized (B) coefficients for overall sample………………………………………………………………  70

Figure 3  Revised risky sexual behavior model: Standardized (β) coefficients for overall sample…………………………………………………………………  71
ABSTRACT

Although a number of studies have demonstrated the effects of mass media on various behaviors the systematic process of examining media related risk factors in sexual health behavior models has not been fully explored. This study offers a rationale, and several propositions and hypotheses for a more inclusive model of sexual risk taking integrating two mass media-related variables with five traditional health risks factors that appear in the current literature. The study also explores gender differences among the proposed relationships in the model.

The study tests the proposed integrated model using a secondary analysis via structural equation statistical methods applied to the Teen Media and Health Survey data. The final model supported relationships that were hypothesized based on a rationale linking several mass communication and health-related behavior theories. Findings from this study suggest that sexual intentions that are risky are strong predictor of self-reported sexual behaviors that are risky. In addition, permissive attitudes regarding sex, perceptions of peer norms that are risky, and sexual self efficacy also predict sexual intentions that are risky. This results from the study futher support the utility of impulsive decision making and sensation seeking when predicting sexual risks.

The current model and study results indicate that overall exposure to mass media was a significant antecedent of adolescents’ perceptions that media messages encourage sexual behaviors. Perceptions that media messages encourage sexual behaviors is also succesfully used to predict adolescent’s permissive attitudes regarding sex, their perceptions of peer norms that are risky, and the adolescents’ perceptions of sexual self efficacy.
The overall model is also tested in separate male/female models to examine the potential generality of the model across gender subgroups. The results indicate more similarities than differences in sexual risk taking among males and females. One notable difference is the path from mass media exposure to perceptions that media messages encourage sexual behaviors, which is appreciably stronger among females than among males. Another notable difference is that the pathway from sexual intentions that are risky to sexual behaviors that are risky, which again is stronger among females than among males.

There are several implications for interventions that arise from this study. Media exposure and perceptions of sexuality through media play an important role in adolescents’ attitudes, norms and perceptions of self efficacy. Parents, educators, health practitioners should discuss with adolescents the content of popular mass media, along with the ways that the popular media influence young audiences. Parents, teachers and health practitioners need to pay particular attention to creating messages that can combat the information that adolescent receive from mass media about sex and sexual behaviors. The most important implication may be that adults in U.S. society should take children’s exposure to media seriously, pay attention to what their children are viewing and to become active in their communities advocating for more socially responsible media. A concerted effort can be made to reduce sexual innuendos, images and portrayals in the media.
CHAPTER 1
INTRODUCTION

General Considerations

It is becoming apparent to researchers that much of the burden of illness in adults can be traced to patterns of modifiable problem behaviors that begin in adolescence (Conner & Norman, 2005; Rogers & Ginzberg, 1992). Researchers have examined the proximal and distal factors of problem behaviors based on the assumptions that in industrialized countries a substantial proportion of the morbidities and early mortalities arise from modifiable health compromising actions (Conner & Norman, 2005). Consequently, a considerable body of research has examined the role of various protective and risk factors in predicting both healthy behaviors and behaviors that pose threats to an individual’s wellbeing. Identification of these factors, especially among adolescents, has increasingly become a focus of research in health-related disciplines (Conner & Norman, 2005, Norman, Abraham & Conner, 2000).

Various approaches have been taken to better understand risk factors associated with unhealthy behaviors among adolescents. Much of the prior research has been focused on social, psychological and environmental factors. These factors included social support, socio-demographics, personality traits, parental models and, in recent times, media-related variables (Brown & L’Engle, 2009, Rogers & Ginzberg, 1992, Steinberg, 2007). A number of studies have demonstrated the importance of these factors as predictors of detrimental youth behaviors such as smoking, alcohol abuse and sexual risk taking (Adler & Mathews, 1994; Brown & L’Engle, 2009; Conner & Norman, 2005; Osch, Beenackers, Reubsaet, Lechner, Candel, & Vries, 2009; Rosenstock, 1974; Taylor, 1991). The risk factors have also been used in theoretical models
predicting health behaviors. These models include the health belief model (HBM), the theory of planned behavior (TPB) and, more recently, the multiple domain model (MDM).

**Problem Statement**

Risky sexual behaviors, in particular, have been a focus of several studies among adolescents in the United States (Buhi & Goodson, 2007; Conner & Norman, 2005; Romer, 2003). Some researchers argue that studies of adolescent sexual behaviors are key to reducing the incidence of sexually transmitted infections and diseases (Fenton, Johnson, McManus & Erens, 2001). Sexually transmitted infections (STIs) and diseases (STDs) contracted during adolescence can have adverse consequences for immediate and long term reproductive health. They can result in pelvic inflammatory diseases, infertility, ectopic pregnancies, preterm births and fetal abnormalities (Kaestle, Halpern, Miller & Ford 2005). Moreover, current estimates indicate that risky sexual behaviors resulting in STIs and STDs are among the leading causes of morbidity and early mortality among both youth and adults in the United States (Center for Disease Control, 2010).

There are a number of theoretical social, psychological, and environmental risk factors that are positively associated with unhealthy sexual behaviors. These traditional factors include a) permissive attitudes regarding sex, b) perceptions of peer norms that are risky [i.e. peers condone risky sexual behaviors], c) low perceptions of sexual self efficacy, d) high sensation seeking and high impulsive decision making, and e) behavioral intentions that are immediate antecedents of sexual behaviors that are risky (Ajzen, 1991; Armitage & Conner, 2000; Buhi & Goodson, 2007; Carvajal & Estrada, 2005; Donohew, Zimmerman, Cupp, Novak, Colon, & Abell, 2000; Fortenberry, 2003; Holden & Nitz, 1995; Institute of Medicine, 2001; Kirby, 2003; Santelli & Beilenson, 1992; Stevens-Simon & McAnarney, 1995; Tremblay & Frigon, 2004; Zimmerman, Noar, Price, Dekthar, Cupp, Anderman & Lock, 2007). In addition to the traditional
threats, recent studies have further examined adolescent exposure to mass media and the sexual messages appearing in popular mass media as potential health risk factors (Brown & L’Engle, 2009; Brown & Witherspoon, 2002; Giles & Maltby, 2004). Strasburger (2010) specifically argues that mass media in the United States are increasingly becoming sex educators for adolescents. Current estimates indicate that American children and teenagers spend more than 7 hours per day with a variety of popular media, many of which are filled with sexual messages and images that are unrealistic and potentially risky (Strasburger, 2010).

Media exposure and media content been discussed for a number of years as contributing to adolescents’ notions of sex and sexuality (Delaney, 2003; Igra & Irwin, 1995; Ward, 2003). However, theoretically based investigations are still rare that document the effects of mass media exposure, and perceptions of media messages on adolescents’ sexual intentions (Escobar-Chaves, Tortolero, Markham, Low, Eitel & Thickstun, 2005; Ray & Jat, 2010). In particular, health behavior theories and models have rarely incorporated mass media related variables as predictors of sexual health. This absence is notable, since numerous studies have demonstrated that exposure to mass media and exposure to the ubiquitous sexual content across media are positively correlated with a variety of sexually risky behaviors (Brown & L’Engle, 2009; Brown, L’Engle, Pardun, Guo, Kenneavy & Jackson, 2006; Escobar-Chaves et.al, 2005; Strasburger, 2010).
Purpose and Organization

Purpose of the Study

This study has three primary objectives. Following a review of the theoretical and empirical literature, this study's initial objective is to offer a rationale, propositions and specific hypotheses for an inclusive theoretical health model that integrates two mass media-related variables with five traditional health risk factors. This model, specifically, is used to predict adolescents’ intentions to engage in risky sexual behaviors, and their actual sexual behaviors that are risky.

Next, this study’s objective is to test the proposed integrated model using structural equation statistical methods. These statistical techniques will provide a test of the hypothesized relationships (paths) and the model, overall. The structural equation model (SEM) will be tested using data collected as a part of the Teen Media and Health Survey (L’Engle, Pardun & Brown, 2004). The Teen Media and Health Survey (TMHS) was a five-year project, funded by the National Institute of Child Health and Human Development. The final objective is to use the study results to provide insights into potential applied interventions to reduce adolescent sexual behavior risks and suggestions for future theory-based research addressing sexual risks.

Organization of the Study

The literature review in Chapter 2 examines trends in risky sexual behaviors among adolescents and presents current prevalence and incidence rates of STIs and STDs among the study population. It also reviews the research on five traditional risk factors reported in various health related models that have been used to examine sexually risky behaviors. These traditional risk factors are (a) permissive attitudes regarding sex, (b) perceptions of peer norms that are risky [i.e., peers condone risky sexual behaviors], (c) low perceptions of sexual self efficacy, (d) high
sensation seeking and high impulsive decision making, and (e) behavioral intentions that are immediate antecedents of sexual behaviors that are risky. This chapter introduces two media-related variables that also represent potential risk factors. Chapter 2 further examines the health and media literature for co-occurring relationships between the traditional and new risk factors. Finally, based on the review, the chapter provides a theoretical risky sexual behavior model and concurrent propositions resulting in specific hypotheses.

Chapter 3 focuses on the methodology used to test the proposed risky sexual behavior model. The study features a secondary analysis of repeated sample data in the Teen Media Health Survey. This chapter includes an examination of (a) the sampling frame and data collection, (b) the conceptual and operational characteristics of the indices constructed from items in the TMHS and (c) the statistical procedures used to analyze the study model and hypotheses.

The data analysis results are discussed in Chapter 4. The chapter provides a summary of descriptive measures for the baseline and follow-up sample results found in the TMHS. Descriptive statistics and reliability measures and are reported for each of the predictor and predicted indices in the risky sexual behavior model. A Pearson product moment correlation matrix summarizes the relationships among the predictor and predicted indices. This chapter also features structural equation analysis including fit indices, plus unstandardized and standardized path coefficients for an original and a revised hypothesized risky sexual behavior model. The structural equation procedures are repeated in an exploratory analysis for the risky sexual behavior model comparing male versus female subsamples.

Chapter 5 provides an overview of the study and a discussion of the survey results. This discussion elaborates on the theoretical and applied aspects of the revised risky sexual behavior
model. Particular attention is devoted to the study’s potential contributions future theory-based research, and theory building. Limitations of the study are also reviewed. This chapter ends with a discussion of the implication of the research results for applied health interventions and directions for future research.
CHAPTER 2
LITERATURE REVIEW

Risks in Adolescents’ Risky Sexual Behaviors, STIs and STDs

Risky Sexual Behaviors Among Adolescents

Current data from the U.S. Center for Disease Control (CDC, 2010) provide the following profile of adolescent sexual behaviors: (a) 46 percent of high school students report that they have had sexual intercourse, (b) 5.9 percent had sexual intercourse for the first time before age 13, (c) 13.8 percent of high school students have had intercourse with four or more persons and, (d) 34.2 percent have had intercourse with at least one person within the last three months. In addition, 38.9 percent of the survey sample adolescents report that they did not use a condom during their last sexual intercourse. This finding supported previous research by Terry and Manlove (2000) who reported that 60 percent of sexually active respondents in their study did not use a condom during their most recent sexual intercourse. More notably, Terry and Manlove emphasized that while there was an increase in condom use among females for initial sexual experiences, there was a significant decline in condom usage for subsequent and recent sexual behaviors for both females and males.

Investigations of adolescent risk taking by Zenilman, Weisman, Rompalo, Ellish, Upchurch, Hook et.al (1995) and Salazar, Crosby, DiClemente, WingoodRose, McDermott et.al (2009) have established a causal relationship between risky lack of condom usage, multiple sex partners and incidences of STIs and STDs. In a longitudinal study of condom usage among 598 adolescents, Zenilman et.al (1995) reported that 59 percent of respondents did not use condoms during their most recent sexual encounters. In the follow up study, 21 percent of the respondents
had new incidences of gonorrhea, chlamydia or syphilis. Similarly, Salazar et.al (2009) found that female adolescents who have had four or more lifetime sex partners were 1.61 times more likely to get an STI. In addition, adolescents who have had two or more sexual partners in the last 60 days and also engaged in different types of sex (e.g. oral, anal and vaginal sex) were almost three times more likely to acquire an STI.

**STIs and STDs Trends Among Adolescents**

Summary reports by Seidman and Reider (1994) and Dariotis, Sonenstein, Gates, Capps, Astone, Pleck, et.al. (2008) note the consistency of results from a number of national surveys, including the Youth Risk Behavioral Surveys (YRBS, 2005 to 2008). These results indicate that risky sexual activities among American adolescents have been an increasing health problem. These health problems largely involve morbidities related to transmissions of sexual infections and diseases. The Kaiser Family Foundation (2005) estimated that approximately one in four sexually active teens had contracted an STD (i.e, Chlamydia, gonorrhea, HPV and HIV/AIDS). More recently, the CDC (2008) reported similar estimates.

Data from the National Center for Health Statistics indicates the prevalence of sexually transmitted diseases and infections among adolescents (Birkel, 2009; Doherty, 2010; Healthy People 2010). CDC (2010) reports an estimated 9.1 million cases of sexually transmitted diseases among adolescents and young adults aged 15-24. The most common of these diseases are chlamydia, gonorrhea, and human papillomavirus (HPV). In addition to these STDs, current estimates indicate that approximately 350,482 U.S. adolescents and young adults (13-29 years) have human immunodeficiency virus (HIV) infections, and an estimated 6,610 new HIV cases are reported annually among young individuals, ages 15 - 24 (CDC, 2010). The following
section reviews the incidence and prevalence patterns for four major STIs (i.e., Chlamydia, gonorrhea, HPV and HIV).

**Chlamydia.** Increasing numbers of Chlamydia infections have made it the most widespread STD among adolescents in the United States (CDC, 2007). From 2006 to 2007, chlamydia prevalence rates for 15- to 19-year-old women increased 6.4 percent. Chlamydia increased from 2,824 per 100,000 females in 2006 to 3,004.7 per 100,000 females in 2007. The disease also increased 14.3 percent among 15-19 year old males (from 537.9 per 100,000 in 2006 to 615.0 per 100,000 in 2007) Chlamydia rates for 2005 to 2009 likewise increased by 25 percent among youth (15-24 years) in the 50 most populous metropolitan areas (CDC, 2010). Most recently, from 2008 to 2009, incidences of chlamydia increased by 3.3 percent for women and 6.1 percent for males (CDC, 2010). In 2008 the total number of chlamydia cases was 1,210,523, representing 1401.3 cases per 100,000 population (CDC, 2009).

**Gonorrhea.** Similarly, between 2006 and 2007, the incidence of gonorrhea infections among youth 15 to 19 years of age was 2.1 percent, an increase of 0.7 percent (CDC, 2007). In addition, 15- to 19-year-old females had the highest prevalence rate of gonorrhea (647.9 per 100,000 population) compared to any other age/sex group (CDC, 2007). Among males, the prevalence rate for gonorrhea was 487.8 per 100,000. Notably, the incidence rates for 15- to 19-year-old men increased 3.8 percent during the 2006-2007 time period (CDC, 2007). In 2009, a total of 301,174 cases of gonorrhea were reported in the United States (CDC, 2010).

**Human Papillomavirus (HPV).** Approximately 20 million men and women in the U.S. are currently infected with human papillomavirus (HPV) and another 6 million are newly infected each year (CDC, 2009). HPV is so common that at least 50% of sexually active men and women get it at some point in their lives (CDC, 2009; Winer, Lee, Hughes, Adam, Kiviat &
Koutsky 2003). In addition, modeling studies suggest that up to 80 percent of sexually active women will be infected with HPV by age 50 (Saslow, Castle, Cox, Davey, Einstein, Ferris et.al 2007). Human papillomavirus has now been one of the leading causes of cervical cancer among women in the United States.

**Human Immunodeficiency Virus (HIV).** Finally, young people, 13-24 years of age in the United States, are at persistent risks for HIV infection. The risks are especially notable for youth of minority races and ethnicities (CDC, 2008). CDC (2008) also estimates that approximately 7,761 young people are currently living with AIDS - a 42% increase since 2000. In addition, Sill, Constantine, Wilson and Peralta (2010) report that among young adults living with HIV, most contract the disease in adolescence.

**Summary**

Sexually transmitted infections and diseases continue to be relatively serious health problems among U.S. adolescents. The most common of these are chlamydia, gonorrhea, and HPV. Though less common, HIV among youth continues to be an especially severe health concern. STIs and STDs are public health problems that lack easy solutions because they are often rooted in widespread, maladaptive human behaviors (CDC, 2010). Given the trends of STIs and STDs among adolescents and the subsequent burden of illness, it is important to examine the relevant determinants of these behaviors.

The next section discusses some of the major health related theories and models. It provides a theoretical and empirical review of five traditional risk factors associated with sexually unhealthy behaviors i.e. (a) permissive attitudes regarding sex, (b) perceptions of peer norms that are risky [i.e. risky sexual behaviors], (c) low perceptions of sexual self efficacy, (d) high sensation seeking and high impulsive decision making, and (e) behavioral intentions that are
immediate antecedents of sexual behaviors that are risky. Specifically, this section demonstrates
the consistency and utility of these risk factors across major health theories and models. It further
examines the empirical literature concerning (a) mass media exposure and (b) perceptions of
media messages and adolescent sexually risky behaviors. Finally, this section provides a
hypothetical model through which mass media related factors can be integrated with established
risk factors to predict sexually risky behaviors. This is an extension of the current literature.
Health-related Theories and Models

Various theories and models have been used to predict adolescent sexual activities (Albarracin, Kumkale & Johnson, 2004; Janz, Champion & Strecher, 2002; O’Leary, Wolitski, Remien, Woods, Parsons, Moss et.al, 2005). The most popular include the health belief model (HBM; Rosenstock, 1966), the protection motivation theory (PMT; Rogers, 1975), the theory of reasoned action (TRA; Fishbein & Ajzen, 1975) along with the theory of planned behavior (TPB; Ajzen, 1991), social cognitive theory (SCT; Bandura, 1986), and the multiple domain model (MDM; Zimmerman, Noar, Price, Dekthar, Cupp, Anderman et.al, 2007). These theories and models provide an organized guide to better understand factors underlying maladaptive behaviors such as sexual risk taking. They can also aid in presenting a mechanism through which the effects of newer factors such as mass media exposure and perceptions of mass media can be systematically studied.

The health belief model. The HBM focuses on two aspects of individuals’ representations of health and health behavior: threat perception and behavioral evaluation (Abraham & Sheeran, 2005). Threat perception is construed as two key beliefs (a) perceived susceptibility to illness and health problems and, (b) the anticipated severity of the consequences of illnesses. Behavioral evaluation also consists of two sets of beliefs, (a) those concerning the benefits or efficacy of a recommended health behavior and, (b) those concerning the costs of enacting the behavior. In addition, the model proposes that cues to actions such as individual perceptions or social influence can activate behaviors when appropriate beliefs are held (Abraham & Sheeran, 2005).
**Protection motivation theory.** Similar to the health belief model, PMT emphasizes cognitive processes that predict and mediate behaviors and outline the cognitive responses resulting from fear appeals (Norman, Boer & Seydel, 2005). PMT suggests that various environmental and intrapersonal sources of information can initiate two independent appraisal processes: threat appraisal and coping appraisal. The appraisal of the health threat and the appraisal of the coping responses result in the intention to perform adaptive responses (protection motivation) or may lead to maladaptive responses. Maladaptive responses are those that place an individual at health risk and include behaviors that lead to negative consequences such as unsafe sexual behaviors. The protection motivation theory proposes that the intention to protect oneself depends upon four factors (a) the perceived severity of a threatened event, (b) the perceived probability of the occurrence, (c) the perceived response efficacy and (d) the perceived self efficacy.

**Theory of reasoned action and theory planned behavior.** In a review of TRA, Conner and Sparks (2005) argue that TRA explains the relationships between beliefs [attitudes], norms and behaviors, and interposes behavior intention between the predictor variables and actual behaviors. The TRA suggests that the proximal determinant of volitional behavior is one’s behavioral intention to engage in that behavior. Beliefs concerning specific behaviors and perceived norms directly impact behavioral intentions. Beliefs and attitudes in TRA feature anticipated behavioral outcomes, while norms represent the perceived social expectations and pressures from others to perform the targeted behaviors. Thus, personal attitudes and norms help shape intentions, which in turn shape volitional behaviors. Derived directly from the theory of reasoned action, the theory of planned behavior (TPB) was developed to broaden the applicability of the TRA by incorporating perceived behavior control as an additional predictor.
of behavior (Conner & Sparks, 2005). The concept of perceived behavioral control has been acknowledge to be comparable to self efficacy (Fishbein & Capella, 2006).

**Social cognitive theory.** According to SCT, human actions and motivations are regulated by forethought (Luszczynaka & Schwarzer, 2005). The theory outlines a number of crucial factors that influence behaviors. The first factor is perceived self efficacy, which is concerned with people’s beliefs in their capabilities to perform specific actions required to attain a desired outcome. The theory proposes that the motivation to act on a certain behavior is made possible by a personal sense of control. Outcome expectancies are the other core construct of SCT which are concerned with people’s beliefs about the possible consequences of their actions. Bandura (1977) also suggests that vicarious experience can be a source of self efficacy. When a ‘model person,’ that is similar to the individual, successfully masters a difficult situation, a social comparison processes can enhance self efficacy beliefs. In addition, self efficacy can influence other cognitions, motivations and affective processes (Luszczynaka & Schwarzer, 2005). SCT also includes perceived impediments, perceived opportunities and goals as major determinants of behavior (Luszczynaka & Schwarzer, 2005).

**Multiple domain model.** The MDM is an integrative model that “goes beyond traditional social psychological models for a broader understanding of condom use in adolescents” (Zimmerman, et. al, 2007, p.380). The domains of the proposed model include social structural variables (gender, race, age, socio-economic status), personality and individual differences (sensation seeking, impulsivity), environmental variables (educational aspirations, parent child communication, parental monitoring), psychological variables (sexual attitudes, norms, self efficacy) and situational/contextual variables (contraceptive use, substance use) (Zimmerman et.al, 2007). The proposed model of condom use hypothesizes that these domains
can be theoretically ordered from most proximal to most distal. MDM suggests that while intentions can be most proximal to behavior, personality differences and environmental variables are the most distal variables to behavior (Zimmerman et.al, 2007).

**Recurring Traditional Risk Factors in Health-Related Models**

A comparison of these theories suggests that at least six theoretical constructs have been repeatedly useful in predicting and understanding behaviors (Fishbein, 2000; Fishbein, Triandis, Kanfer, Becker, Middlestadt & Eichler, 2001). These constructs include (a) beliefs/attitudes, (b) norms, (c) perceptions of self efficacy /behavioral control, (d) sensation seeking, (e) impulsive decision making, and (f) behavioral intentions. Building on key elements of these health-related models, and the MDM model in particular, the following discussion (a) merges aspects of the different theoretical perspectives, and integrates both (b) exposure to the ubiquitous sexual content in popular mass media and (c) perceptions that media messages encourage sexual behaviors as potential risk variables.

Various authors note the sizeable overlap between the traditional constructs in the health-related theories and models that were previously reviewed (Armitage & Conner, 2000; Igra & Irwin, 1995; Norman & Conner, 2005). Norman and Conner (2005), moreover, argue that the distinctions that appear in the alternative models often represent variations in labeling rather than meaningful differences in the underlying constructs. In addition, previous studies have successfully employed similar constructs with differences in measurement (c.f., Maurer & Pierce, 1998; Whitley, 1997; Zimmerman et.al, 2007). The subsequent section reviews the traditional risk constructs.

**Risk-related attitudes.** A range of theoretical models feature attitudes as predictors of intentions and behaviors (c.f., the TRA, TPB and MDM). Using a variety of measures, empirical
studies of these theories and models have demonstrated the utility of attitudes as predictors of both safe and unsafe (risky) health-related behaviors (Austin, Ahmad, McNally & Stewart, 2002; Carvajal & Estrada, 2005; Jackson & Aiken, 2000). For instance, in an examination of a psychosocial model of sun protection behaviors, Jackson and Aiken (2000) found that beliefs about photo-aging and skin cancer correlated positively with both intentions to use sun protection and with actual sun-protective behaviors. In another study of dangerous driving, Iversen (2004) noted that drivers with more positive (risk-taking) attitudes toward rule violations and speeding were more frequently engaged in actual risky driving behaviors.

Regarding safe and risky sexual behaviors, Carvajal and Estrada (2005), in a longitudinal study among Latino males, documented that safe sex attitudes were positively correlated with intentions to use condoms for “new” sex partners. In addition, positive or permissive attitudes toward sex have been positively associated with actual intercourse during the last year (Whitbeck, Yoder, Hoyt & Conger, 1999), early sexual initiations (Meier, 2003; O’Donnell, Myint, O’Donnell & Stueve 2003), and intentions to have sex (Sieverding, Adler, Witt & Ellen 2005). In a similar fashion, Zimmerman et.al (2007) found that overall, favorable condom attitudes positively predict intentions to use condoms in sexual situations.

Perceived Norms. Theoretical models such as the TRA, TPB and MDM further suggest that social influences, particularly subjective or perceived norms, are important predictors of health-related activities including sexually risky behaviors (Armitage & Conner, 2001; Branstrom, Ullen & Brandberg, 2004; Buhi & Goodson, 2007; Zimmerman et.al, 2007). For example, Jessor, Turbin and Costa (1998) found that among adolescents a positive correlation exists between perceptions that best friends/parents are constructive, healthy role models and self-reported health enhancing behaviors. Conversely, Branstrom, Ullen and Brandberg (2004),
in examining protection against ultra violet radiation, documented that respondents who replied positively to the single item “most people I know sunbathe frequently” were more likely to not use sun protection.

Concerning adolescent sexual behaviors, Busse, Fishbein, Bleakley and Hennessy (2010) document that adolescents who believe that most of their friends have had sex are more likely to intend to have sex in the near future. A meta-analysis by Buhi and Goodson (2007) notes that adolescents who perceived their friends to hold less favorable views towards sex were less likely to have intentions to have sex and were more likely to be sexually abstinent. While norms have been found to be independently predictive of intentions (Beck & Ajzen, 1991; Busse et.al, 2010; Conner, Martin, Silverdale & Grogan, 1996), several authors have argued that subjective/perceived norms are not very useful components of psychosocial, behavioral models. Previous meta-analyses of the TRA by Sheppard, Hatwick and Warshaw (1988) and Van den Putte (1991) found that the subjective norms component was the weakest predictor of intentions. In response to these small effect size findings, Armitage and Conner (2001) have argued that the most likely explanation for the weak correlation is not due to construct, but rather to unreliable measurement issues where authors have used single items, as opposed to multi-item indices to measure perceived norms.

**Self Efficacy.** Self efficacy is another recurring construct that has been featured in HBM, PMT, SCT, TPB, and MDM. Within SCT, high self efficacy positively predicted adoptions of valued health behaviors and changes in unhealthy behaviors (Schwarzer and Fuchs, 1996). In an examination of SCT, high self efficacy has been found to be positively related to adherence of treatments for different chronic health problems (Luszczyńska & Schwarzer, 2005). Similarly, a self efficacy-related variable, perceived behavioral control, has been included in the TPB to
successfully predict behavioral intentions in a variety of studies (Ajzen, 1985; 1988). Empirical studies of self efficacy have correlated high self efficacy with decreases in problem behaviors such as aggression, truancy, and use of alcohol and drugs (Bandura, Barbanelli, Caprara, & Pastorelli, 2001).

In the area of sexual risk taking, Reitman, St. Lawrence, Jefferson, Brasfield, and Shirley (1996) reported that adolescents who believed that they could take effective precautionary actions to avoid HIV had fewer sexual partners and reported more condom usage during sexual contacts. Similarly, Lewis, Ross and Mirowsky (1999) demonstrated that young women who had lower levels of self-efficacy were less likely to practice safe sexual behaviors and were more likely to experience non-marital pregnancies. Among sexually active adolescents, those who expressed confidence in their ability to put on a condom as well as refuse intercourse with a sexual partner were more likely to use condoms consistently (Dilorio, Dudley, Kelly, Soet, Mbwara & Potter, 2001). Finally, teenage women with high rates of intercourse have been found to use contraceptives more effectively if they believed they could exercise control over their sexual activities (Wang, Wang & Hsu, 2003).

**Sensation Seeking and Impulsive Decision Making.** Zuckerman (1979, 1990, 1994), Palmgreen, Donohew, Lorch, Hoyle and Stephenson (2001) and Zimmerman et al. (2007) argue that the personality traits of sensation seeking and impulsive decision making can be risk factors influencing health-related behaviors. Zimmerman et al., in particular, offer the Multiple Domain Model which uses sensation seeking and impulsive decision making to predict health-related norms, attitudes and self efficacy. High sensation seekers, when compared to low sensation seekers, have been posited to be individuals who have greater needs for novel, exciting, unusual and thrilling experiences (Zuckerman, 1979). A number of studies have previously found high
levels of sensation seeking to be positively linked to increased adolescent drug use (Palmgreen et.al, 2001; Sheer & Cline, 1994; Zuckerman, Ball & Black, 1990), alcohol and tobacco use (Comeau, Stewart & Loba, 2001) and risky sexual behaviors (Donohew et.al, 2000; Zuckerman, 1994).

Impulsive decision makers (IDM) are posited to be individuals who have a tendency to make decisions without a great deal of thought. Compared to rational decision makers, impulsive decision makers were less likely to plan ahead and were more likely to act on whims (Donohew et.al, 2000). Individuals with the IDM trait were also more likely to abuse alcohol, to have dangerous driving habits, to participate in violent crimes and to have unsafe sex (Caspi, Harrington, Dickson, Begg, Langley, Moffi, & Silva, 1997). A recent study by Reyna and Farley (2006) also link the personality trait to poorer social relations and poorer health outcomes.

With regards to sexual risk taking, Donohew et. al (2000) in their analysis of adolescents in 17 high schools, reported that individuals who were high sensation seekers and impulsive decision makers were more likely to engage in risky behaviors, use alcohol before sex, use marijuana before sex, never refuse unsafe sex, and have five or more sex partners in their lifetime. Conversely, using a sample of college students, Arnold, Fletcher and Farrow (2002) reported that low sensation seekers were more likely to actually use condoms during sexual encounters. Most recently, Zimmerman et.al (2007) note that high sensation seekers have more negative condom norms. The study further notes that impulsive decision makers had more negative condom-related attitudes, more negative norms and lower self efficacy.

Summary

In the past decade, there has been a growing recognition of the usefulness of several recurring theoretical constructs in modifying health-related behaviors. These constructs and their
relationship with behavioral intentions have provided a framework to help identify the predictors of behaviors and have been an “essential first step in the development of successful interventions…” (Fishbein & Cappella, 2006, p.51). An important question for this study is to what extent can media related risk factors be incorporated with the traditional constructs to predict health behaviors. Various theories have previously demonstrated the utility of media related factors in predicting behaviors. The next section reviews these theories as well as empirical studies on the two potential media related risk factors.

**Media Theories and Review of Media Related Risk Factors**

Few health-related theories and theoretical models have included mass media constructs as potential risk factors (c.f., Igra & Irwin, 1995; L’Engle, Brown, & Kenneavy, 2006). Even though most predictive models of adolescent sexual behaviors do not include effects of mass media exposure on adolescents (Irwin & Millstein, 1986; Jessor & Jessor, 1977), a number of empirical studies have found mass media exposure to predict sexual risk taking behaviors. Specifically, a substantial amount of research has indicated that heavy users of television and other popular media, have often been exposed to sexual themes cutting across content and media (Aubrey, 2007; Brown & L’Engle, 2009; Signorielli, 1986; Timmerman, Allen, Jorgensen, Herrett-Skjellum, Kramer, & Ryan, 2008). This general exposure has been further linked to sexual risk taking behaviors (Brown and Witherspoon, 2002; Polacek, Rojas, Levitt, & Mika, 2006; Strasburger, 2004).

**Overview of Mass Media Theories and Research**

Escobar-Chaves et.al (2005) in their review of mass media theories argue that, over time, messages recurring across media content can change psychological and behavioral functions among audiences. The media theories they reference supporting this argument include (a)
cultivation theory (Gerbner & Gross, 1976), (b) social learning theory (Bandura, 1986), (c) disinhibition theory (Berkowitz, 1989), and (d) super-peer theory (Strasburger & Wilson, 2002).

**Cultivation Theory.** Previous mass media research indicates that high levels of television media exposure can alter audiences’ perceptions of the “real world,” and can “prime” their expectations concerning actual behaviors and events (Gerbner & Gross, 1976; Morgan & Signorielli, 1990; Potter, 1986). Cultivation theory postulates that heavy exposure to mass media messages can create beliefs in social characteristics that are more consistent with media-directed versions of reality than with reality itself (Gerbner, Gross, Morgan & Signorielli, 1994). Escobar-Chaves et.al (2005) emphasize that media messages and portrayals can affect adolescent behaviors over time by influencing their expectations and offering examples of behaviors that the youth have not personally experienced. In particular, this can occur when “a child’s expectation about the outcome of certain behaviors are altered through identification with the character portraying or providing the stimuli, by raising or lowering behavioral inhibitions, by modifying the potential for environmental cues to foster certain behaviors or by linking specific meanings to a behavior” (Escobar-Chaves et.al, 2005, p. 304).

**Social Cognitive Theory.** Bandura’s (2001) social cognitive theory of mass communication argues that a vast amount of information about human values, beliefs and behavior patterns are gained from the modeling of characters and events occurring in mass media. With regards to vicarious learning, Bandura posits that:

“During the course of their daily lives, people have direct contact with only a small sector of the physical and social environment. They work in the same setting, travel the same routes, visit the same places, and see the same set of friends and associates. Consequently, their conceptions of social reality are greatly influenced by vicarious experiences—by what they see, hear, and read— without direct experiential correctives. To a large extent, people act on their images of reality. The more people’s images of reality depend upon the media’s symbolic environment, the greater is its social impact” (Bandura, 2001, p.271).
Furthermore, in their early research, Bandura, Ross and Ross (1963) and Bandura (1997) noted that children’s learning from media is more likely to be translated into their own actions when the media role model is similar to the viewer and the media behavior is positively enforced. Bandura (1977, 1997) similarly proposed that through the process of “priming,” adolescents who view other adolescents in the media enjoying sexual behavior with no negative consequences have an increased probability of observational learning and behavioral imitation. This proposition has also been supported in research reported by Ward (2003), Eggermont (2004), Martino, Collins, Elliot, Strachman, Kanouse, and Berry (2006) and Ward and Friedman (2006).

**Disinhibition theory.** Berkowitz’s disinhibition theory (1989) postulates that continued exposure to mass media (especially television) can reduce viewers’ inhibitions and make them more accepting of behaviors portrayed on mass media. Gunter (2008) found that in the media violence literature disinhibition theory posits that media violence can influence aggressiveness in the audience. In addition, media portrayals can trigger nonimitative aggression in viewers by justifying the use of violence and reducing socially conditioned inhibitions against behaving aggressively (Gunter, 2008).

**Super-peer theory.** The super-peer theory advanced by Strasburger (1997) proposes that media represent a potent source of information for teens as to what are normative behaviors and the media influence can exceed the influence of an adolescent’s more traditional peer group. Mass media takes advantage of children and teens’ attractions to characters perceived to be “peers,” and who they long to be like. Such characters and their media activities provide templates for youths’ “aspirational” behaviors (Escobar-Chaves et.al, 2005).
In summary, adolescents, who may or may not have first hand sexual experiences, can learn and make inferences about sex related beliefs, norms and behaviors from images and portrayals in mass media. Various media theories indicate that mass media character portrayals involving sexual values and activities can provide normative guidance for adolescents. Some researchers further support the notion that mass media characters can act as peers that are especially influential among young audiences (Bown, Halpern & L’Engle, 2005). The following discussion reviews the content of media that are popular among adolescents and summarize research on youth exposure to mass media in the United States. This discussion additionally provides a rationale for viewing exposure to mass media and adolescents’ perceptions of media messages as risk factors potentially influencing unhealthy sexual behaviors.

**Media-Related Risk Factors**

There is ample evidence suggesting that there are, and historically have been, a large number of sexual images and sexual portrayals in U.S. mass media (Brown and L’Engle, 2009; Escobar-Chaves, et.al, 2005; Kunkel, Biely, Eyal, Cope-Farrar, Donnerstein, & Fandrich, 2003; Kunkel, Eyal, Finnerty, Biely & Donnerstein, 2005). These images moreover, cut across media and content (Brown & Witherspoon, 2002; Strasburger, 2004). Early empirical studies specifically reported that overall exposure to mass media was a significant factor in increasing sexual risk taking among youth (Brown, Greenberg & Buerkel-Rothfuss, 1993; Brown & Newcomer, 1991). Two national, longitudinal studies specifically generated data demonstrating that exposure to mass media was positively related to adolescent coital activities (Chandra, Martino, Collins, Elliot, Berry, Kanouse, et al. 2008; Collins, Elliott, Berry, Kanouse, Kunkel, Hunter et.al, 2004). More recently, research by Pardun, L’Engle and Brown (2005) and Escobar-Chaves and Anderson (2008) have illustrated that exposures to sexual messages on television, in
magazines and in electronic media are positively correlated with increases in risky sexual behaviors and with sexual initiations at early ages.

A national study by Sutton, Brown, Wilson, and Klein (2002) further documented that in comparison to parents, religious leaders, therapist and counselors, teens aged 13–18 ranked television, movies, and magazines as more useful sources of information for how to talk about sex. In more current studies, mass media, including television, movies, music and the internet have been documented to serve as key sources of information for teens about sexuality and adolescents themselves acknowledge that they turn to the mass media for information about sexual activities (Wright, 2009).

In addition to overall exposure, perceptions of media messages can play a role in adolescent socialization. Empirical research by Larson (1996) and Brown and Witherspoon (2002) specifically suggest that adolescents’ perceptions of mass media messages can have an impact on their sexual beliefs and attitudes. The socializing impact of the media has been particularly potent in areas where adolescents’ personal experiences are limited (Huston, Donnerstein, Fairchild, Feshbach, Katz, Murray et al., 1992) and can be especially influential when young teens have little or no personal experience with sex (Brown, Walsh-Childers & Waszak, 1990). L'Engle, Brown and Kenneavy (2006) compared influences of mass media on adolescents’ sexual intentions and behaviors. The study demonstrates that after controlling for age, gender, race and socioeconomic status, exposure to mass media accounted for 13 percent of the variance in intentions to have sexual intercourse in the near future, 10 percent of the variance in actual light sexual activities and eight percent of the variance in actual heavy sexual activities.

**Television availability and adolescent usage.** While other forms of mass media (such as the internet) are taking on an increasing role in the American youths’ media experiences,
traditional television consumption has also continued to grow (Nielsen Report, 2009). Brown, L'Engle, Guo, Kenneavy, and Jackson, (2006) note that even though young consumers have driven the development of new media platforms, their television exposure has actually increased over the years. A recent report to The Kaiser Family Foundation by Rideout, Foehr and Roberts (2010) estimates that from 2004 to 2009, television viewing among adolescents aged 8-18 increased from 3 hours and 51 minutes to 4 hours and 29 minutes per day.

**Television contents.** Current research suggests that sexual images, portrayals and messages across television programs have similarly increased over the past two decades (Escobar-Chaves et.al, 2005; Kunkel et.al, 2003). Sexual images on television have become ubiquitous. An American teenager on average watches nearly 14,000 sexual messages per year (Kunkel et.al, 2005). These messages include sexual innuendos, sexual jokes and depictions of sexual behaviors. The messages, in addition, rarely offer cautions concerning sex. Brown and L'Engle (2009) report that while 83 percent of the top 20 teen shows have 6.7 sexual scenes per hour, only 15 percent of these shows contain any mention of the risk and responsibility involved in having sex.

It is also notable that explicit depictions of sexual intimacy on television in the U.S. have been reported to be eight times more common between unmarried partners as compared to married partners (Strasburger, 2004). Moreover, roughly four million American teenagers have been regular viewers of daytime television whose soap operas and talk shows containing high levels of sexual images, portrayals and innuendos (Greenberg & Busselle, 1996, Kunkel et.al, 2003). According to Kunkel et.al (2003), television watched by adolescents has had “unusually high” amounts of sexual content- overall 80 percent of the programs popular with teens had sexual content and 20 percent contained explicit or implicit intercourse. Finally, recent research
indicates that even in family hour programming, almost half of the family hour shows have had sexual content (Jensen & Jensen, 2007).

**Television exposure effects on adolescents.** As early as the 1990s, researchers found that those adolescents who viewed more television with sexual content were also more likely to have begun intercourse (Brown & Newcomer, 1991). For females in particular, a positive relationship has been detected between exposure to music videos (on television) and premarital sex (Brown & Newcomer, 1991). Collins et.al (2004) likewise observed that teens with high television exposure are more likely to begin intercourse at a younger age and exposure to popular television programming doubles the risk of early initiation of sexual intercourse. Adolescents who watch two or more hours of overall television per day are 1.5 times more likely than their counterparts to initiate sex within one year (Ashby, Arcar, & Edmonson, 2006). More importantly, Strasburger (2005) notes that missing from adolescent and teens’ television diet are the “healthier aspects of human sexuality, such as answers to questions about what it means to be a man or a woman, when is sexual activity appropriate, what a healthy body self-image is, and how pregnancy and sexually transmitted disease can be prevented” (p.270). Most recently, Chandra et.al (2008) have documented that youth who see more sexual content on television are also youth who watch more television overall, establishing a link between overall hours exposed to television in general and increased television experiences with sexual content.

**Movies availability and adolescent usage.** Although research on media exposure and adolescent sexual behaviors, especially risky sexual behavior, has focused mainly on television, there have been similar studies of popular movies (Escobar-Chaves et.al, 2005). Adolescents are a key demographic audience for the film industry. Escobar-Chaves et.al (2005) estimate that 20 percent of 12-17 year olds go to the movies two to three times a month. The Media Literacy
Clearinghouse (MLC; 2010) currently estimates that U.S. teens spend an average of 1.8 hours a week at the movies.

**Movie contents.** Relatively few studies have assessed the sexual images in movies viewed by adolescents (Escobar-Chaves et.al, 2005). A 1993 study by Brown et.al found that in 16 popular R-rated films seen by 14 and 15 year olds, there were typically 10 instances of nudity per film and roughly 17.5 scenes per film with acts that included visual or verbal references to sexual activity, long kisses, petting, and portrayals of intercourse. Strasburger (2005) indicates that since the 1980s, virtually every R-rated teen movie has featured at least one nude scene and some contain up to 15 instances of sexual intercourse. A study by Dempsey and Reichert (2000) on movie rentals by adolescents reported that among the movies rented, only 15 percent depict scenes of sexual intimacy among married characters compared to 85 percent among unmarried characters. Movies like “American Pie” have been based on the premise that one needs to lose their virginity in high school and before going to college (Escobar-Chaves et.al, 2005).

**Movies exposure effects on adolescents.** A few studies have assessed the effects of exposure to movies on adolescent sexual behaviors. Previous research by Wingood, DiClemente, Harrington, Davies, Hook, and Oh (2001) indicated that sexually active black female adolescents (14-18 years of age) who were exposed to X-rated movies were more likely to have a) multiple sexual partners, b) to have sex more frequently, c) less likely to regularly use contraceptives. These sexually active adolescents were also more likely to test positive for chlamydia.

One of the greatest challenges to understanding the effects of movie exposure on adolescents centers on the merger of the movie and television industries. For over a decade it has been estimated that as many as 80 percent of movies find their way onto network or cable TV (Kunkel, Cope, Farinola, Biely, Rollin, & Donnerstein, 1999, MLC, 2010). It is increasingly
difficult, therefore, to distinguish between young audiences’ exposure to theatre movies versus their exposure to movies on television.

**Internet availability and adolescent usage.** The American Academy of Pediatrics (2001) estimated that 9 to 17 year olds used the internet four days per week and spend almost two hours online at a time. The Pew Research Center (2005) conducted a study of online teenage access and habits and found that (a) overall, 87 percent of teens accessed the Internet at home, 78 percent used it at school and 74 percent had access to the Internet “somewhere else”. This study further indicated that (b) girls were more likely to be social surfers, whereas boys tend towards entertainment surfing. The Nielsen Report (2009) documents that, compared to young adults 18 and older, adolescents consume more online video streams and spend more time watching online videos from home. Younger adolescents aged 2-11 years view an average of 51 streams and 118 minutes of online video during a typical month. Older adolescents aged 12-17 years view an average of 74 streams and 132 minutes of online video. Youth over 18 view an average of 44 streams and 99 minutes of online video (Nielsen Report, 2009).

**Internet contents.** The Internet is an easily accessible medium for adolescents where they can actively view or passively discover a variety of adult oriented websites (Escobar-Chaves et al., 2005). According to a national survey of young people (10-17 years old) who regularly used the Internet, one out of four adolescents had encountered unwanted pornography, and one out of five had been exposed to unwanted sexual solicitations or approaches through the Internet (Finkelhor, Mitchell, & Wolak, 2000). Potter and Potter (2001) indicated that 44 percent of adolescent respondents in their survey had seen X-rated content on the Internet. Moreover, 73 percent of these exposures occurred while the individuals were surfing the Internet and 27 percent occurred while they were opening emails or clicking on links in emails or instant
messages (Potter & Potter, 2001). About 62 percent of adolescents reported that their parents knew little or nothing about the Web sites they visited (Potter & Potter, 2001). Similarly, a study by Strasburger and Donnerstein, (2000) reported that 14 percent of the adolescents admitted watching Internet images they wouldn’t want their parents to know about. More recently, Cameron, Salazar, Bernhart, Whitman, Wingood, and DiClemente (2005) noted that 70 percent of all 15-17 year olds admitted to having stumbled across pornography online.

**Internet effects on adolescents.** Although most teens have access to the Internet for well over a decade, Escobar-Chaves et.al, (2005) reported that there were no studies examining the effects of Internet usage on adolescent sexual attitudes and behaviors. This paucity of research appears to continue to this date.

**Music availability and adolescent usage.** In some ways music is a special entertainment and social phenomenon. Music can be both the content of popular media (e.g., radio, television, movies, videos, CDs, and the Internet) and it can be a medium for social and personal expression. Music clearly plays an important role in the social and personal lives of adolescents (Delsing, Bogt, Engels & Meeus, 2008). Some of the dominant music genres among middle and high school students have included rap/hip hop and rock/alternative rock music (Klein, Brown, Childers, Oliveri, Porter, & Dykers, 1993; Selfhout, Branje, Bogt & Meeus, 2009). Current estimates indicate that adolescents aged 8 to 18 spent on average, 2.5 hours a day listening to music (MLC, 2010).

**Music content.** Music has historically been linked to adolescent angst and rebellion against authority and in any given time period the music that adolescents listen to has often been labeled as risqué by adults (King, 1988; Weidinger & Demi, 1991). Hendren and Strasburger (1993) reported that about 75 percent of popular song lyrics referred to love and sex. Previous
research on music lyrics has indicated that adolescents can and do understand the lyrics, themes and sexual messages imbedded in popular songs (Brown et.al, 1993). A 1999 study by Gentile of the 10 top selling music albums found that of the 159 songs analyzed, 42 percent contained sexual content and 41 percent were either, “pretty explicit” or “very explicit”.

**Music effects on adolescents.** A number of investigators have found links between music and adolescent deviant behaviors. In the 1980s and 1990s, heavy metal music was determined to be a marker for conduct disorders among youth (Klein et.al, 1993) and research by the Council of Communication and Media (2009) links popular music to increased sexual behavior among teenagers aged 14 to 19. However, there is a general scarcity of evidence linking exposure to music contents and adolescents’ sexual behaviors.

**Music videos availability and adolescent usage.** More and more adolescents are receiving their “music needs” from music videos which bring together the mediums of music and television. A study of 1,533 9th graders by Robinson, Chen and Killen (1998) noted that the respondents reported watching music videos for 10 hours per week. A 2005 study by Pew Research Center indicates that MTV has been the most popular TV network for young females and the fourth most popular for young males. More than half (53 percent) of respondents cite MTV as their preferred source for new music (Pew Research Center, 2005).

**Music videos contents.** Previous studies from the 1980s analyzing the content of music videos indicated that 75 percent of the videos showed sexual intimacy and sexual contact without commitment (Baxter, Riemer, Landidn, Leslie, & Singletary, 1985; Sherman & Dominick, 1986). Baxter et.al (1985) stated that music video content “relies on innuendo through clothing, suggestiveness and physical contact” and have a “decidedly adolescent orientation.” Research by
Brown and Witherspoon (2002) found that depending on the genre, one fifth to one half of music videos portrayed sexuality or eroticism.

**Music video exposure effects on adolescents.** Where there might be a paucity of evidence regarding the effect of listening to music on adolescents’ sexual behaviors, research has demonstrated that music videos have demarcated what is “cool” and “what’s out” for many adolescents (Roberts et.al, 1999). Early researchers have indicated that music videos were especially influential sources of sexual information because they combined the visual effects of adolescents’ favorite musicians with sexual visual elements (Brown et.al, 1993). Given their importance in a teenager’s life, Hansen and Hansen (2000) proposed that music videos can influence adolescents’ social judgments and can also prime their sexual views. In an experimental study, Greeson and Williams (1986) found that seventh- and ninth-grade adolescents who were exposed to less than an hour of music videos on MTV were more likely to approve of premarital sex than were adolescents who were not exposed to MTV. Similarly, Calfin, Carroll, and Schmidt (1993) found that college students who were exposed to a music video exhibited more liberal attitudes toward premarital sex than did unexposed students. Recent research also supports the results from previous studies. Zhang, Miller and Harrison (2008) indicate that viewing of music videos is positively related to permissive attitudes towards premarital sex.

Hansen and Hansen (2000) specifically documented that exposure to music videos leads to greater acceptance of antisocial behaviors. Correspondingly, various researchers have noted that greater exposure to music videos leads to increased acceptance of premarital sex for girls (Brown, et.al, 1993; Greeson & Williams, 1986; Hansen & Hansen, 2000). Focusing on rap videos, studies have indicated that girls who watched more rap videos were 2 to 3 times more
like to have had sex with multiple partners (Wingood, DiClemente, Bernhardt, Harrington, Davies, Robillard et.al, 2003). Wingood et.al (2003) found that compared to adolescents who had less exposure to rap music videos, adolescents who had greater exposure were twice as likely to have multiple sexual partners, and 1.6 times more likely to have acquired an STD.

**Perceptions of mass media messages.** Perceptions of mass media messages have not been routinely studied in the communication literature. However, there is preliminary evidence that perceptions of media messages can be important factors mediating the effects of exposure. For instance, Larson (1996) investigated adolescents’ perceptions of television messages concerning the consequences of single motherhood. This study found that among frequent soap opera viewers, marriage was not perceived to be “pleasant”. Moreover, single mothers were perceived to have an affluent lifestyle with an active social life and to have male friends who helped with child care.

Researchers have repeatedly noted the mass media have commonly provided glamorized, unrealistic portrayals of sex (Greenberg, 1994) and have portrayed sexual intercourse as a leisure activity (Arnett, 2002). According to a content analysis of the 15 most popular teen shows, 75% of characters who engaged in sexual activity commonly experienced positive outcomes (Kaiser Family Foundation, 2003b). This is notable since Brown and Steele (1995) reported that adolescents are more likely to emulate portrayed sexual behaviors when they perceive that TV characters do not suffer negative consequences. The researchers further emphasized that the perceived absence of negative consequences could lead adolescents to have more permissive attitudes towards sex and sexual norms.
A hundred years ago, the range of people who could exert an influence over adolescent sexual socialization was often limited to peers, relatives, neighbors, teachers, religious, and community leaders (Giles & Maltby, 2004). Today, this number has swelled with the appearance of a growing range of mass media and a seemingly inexhaustible supply of sexual media content. For over two decades there has been recurring evidence that popular U.S. mass media often feature sexual innuendos, images and portrayals (Strasburger, 2005).

Sexual images and portrayals available to adolescents commonly appear across multiple genres in television, movies, the Internet, music and music videos (Strasburger, 2005). Adolescents’ exposure to popular media in general, and their exposure to sexual contents in the mass media have been linked to risky sexual beliefs, attitudes, perceptions of social norms, and unhealthy sexual behaviors (Brown & L’Engle, 2009; Kunkel et.al, 2005; Straburger, 2005). A limited, though notable, number of studies have linked consumption of popular media with adolescents’ STIs and STDs (Wingood et.al, 2003).

The communication and social psychological literature offers several theoretical rationales that can explain the impact of popular media on youth. Cultivation theory (Gerbner & Gross, 1976) proposes that high levels of media exposure can influence young audiences’ perceptions of the “real world,” and can “prime” their expectations concerning actual behaviors and events. Social cognitive theory (Bandura, 2001) argues that mass communication provides a vast amount of information about human values, beliefs and behaviors. Through social learning, adolescents acquire perceptions and behavioral details that can encourage them to model characters and events portrayed in the popular media. Disinhibition theory (Berkowitz, 1989) similarly suggests that continued exposure to mass media can reduce viewers’ inhibitions and
make them more accepting of media character behaviors. Finally, super-peer theory (Strasburger, 2005) argues that media characters can represent a compelling source of information for teens concerning normative behaviors. For some youth, media characters’ influences can exceed the influence of traditional peer groups. The various theories and supportive research further indicate that the potential for social learning, priming and behavior effects from media exposure are particularly likely where adolescents’ personal experiences are limited, where youth identify with or aspire to be like the media characters, and where popular characters and their behaviors are rewarded, or at least unpunished. Finally, it is important to note that the U.S. mass media and readily available media content can be a private and comfortable way for adolescents to learn and develop perceptions about sex and sexual norms (Brown & L’Engle, 2009). Moreover, it can also reinforce sexual attitudes (Brown & L’Engle). Therefore, it is important to examine how the established risk factors and the potential media-related risk factors interrelate and ultimately influences risky sexual intentions and risky sexual behaviors.
Co-occurrence of Media Related Factors and Established Risk Factors

Although there is mounting evidence on the pervasive nature and effects of sexual imagery across mass media and media content, less is known about the relationships among exposure to sexual media content, perceptions of media content and other risk factors.

Media Exposure and Risk Related Sexual Attitudes

Mass media exposure has been shown to predict sexual beliefs and attitudes (Escobar et.al, 2005; Timmerman et.al, 2008). For example, Ward (1995) reported that adolescents who watched just one hour of MTV videos were more likely to report approval of premarital sex. Previous research by Greenson and Williams (1986) and more current research by Zhang et.al (2008) also observed that adolescents who viewed more music videos on television have more permissive attitudes towards premarital sex. Likewise, in a study of sexually active black female adolescents, aged 14 to 18, those who were exposed to X-rated movies were more likely to have negative attitudes towards using condoms (Wingood et.al, 2001). More recently, Peter and Valkenburg (2010) documented that adolescent perception of sexually explicit internet media result in more instrumental or permissive attitudes towards sex.

Media Exposure and Perceived Sexual Norms

Media exposure has also been useful in predicting social norms (Agha, 2003). Yanovitzky and Stryker (2001) suggested that mass media content reinforces social values and norms, and can further change values and norms. Using a framework of social learning and socialization, (Gerbner, Gross, Morgan and Signorielli (1986), argued that media content represents the boundaries of acceptability in society and serves as “a yardstick against which the individual can compare his or her own behavior” (Yanovitzky and Stryker, 2001, p.211). For example, Ward (2003) found that among young women, frequent viewing of primetime programs predicted a
weaker acceptance of “old-fashioned” courtship norms. Longitudinal analyses by Brown and L’Engle (2009) indicate that an increase in mass media exposure for males predict more permissive sexual norms.

In addition, greater exposure to sexually oriented mass media have also been linked to viewers’ assumptions and expectations about the prevalence of sex and of certain sexual behaviors frequently depicted on TV often creating the expectation that “everyone is doing it.” (Buerkel-Rothfuss & Strouse, 1993; Larson, 1996; Olson, 1994b; Potter & Chang, 1990; Ward, 2002).

**Media Exposure and Sexual Self Efficacy**

Though not extensively researched, exposure to mass media messages has been linked to self-efficacy. In a study of personal efficacy and condom self-efficacy, Agha (2003) found that exposure to positive/healthy mass media messages was associated with a) higher levels of personal self-efficacy, b) increased condom efficacy, c) a lower level of perceived difficulty in obtaining condoms, and d) reduced embarrassment in purchasing condoms. A current study by Bleakley, Hennessy, Fishbein and Jordan (2009) indicates that using media as sources of information about sex is also associated with increased self efficacy for having sex.

**Sensation Seeking and Media Exposure**

Relatively little is known about how sensation seeking relates to mass media exposure. Krcmar and Greene (1999) sampled adolescents in junior high school and college and found that sensation seeking was a positive predictor of adolescent exposure to arousing media content, in particular violent drama. In addition, sensation seeking was also found to be a positively associated with adolescent exposure to contact sports. Arnett (1995) further indicated that adolescents who scored high on sensation scales tended to dominate the audiences for the
arousing, novel media content found in rap and heavy metal music. A study by Aluja-Fabregat and Torrubia-Beltri (1998) similarly concluded that the sensation seeking trait might condition adolescent audiences’ interests in novel topics.

**Sensation Seeking and Perceptions of Media Messages**

While prior research has rarely considered perceived mass media messages, there is one notable study that has examined adolescent perceptions of violent adventure films and cartoons. Aluja-Fabregat and Torrubia-Beltri (1998) studied the relationship between sensation seeking, exposure to and interests in violent media episodes, and how adolescents perceived violent adventure films and cartoons. The researchers found statistically significant positive correlations between higher levels of sensation seeking and perceptions of violent cartoon as fun or thrilling. This pattern was found for both adolescents males and females (Aluja-Fabregat & Torrubia-Beltri, 1998).

**Intentions and Actual Behaviors**

Much of the research associated with health behavior models such as TRA, TPB and MDM employs intention as a dependent variable of interest in addition to actual behaviors. These models posit that intentions are typically good predictors of behaviors. In particular, these theories offer behavioral intentions as being both the immediate antecedent of actions and mediating the influences of other variables such as attitudes, norms and self efficacy (Sheeran, Abraham & Orwell, 1999; Sutton, 1998).

Models such as TPB and MDM have specified attitude towards behavior, subjective norm and perceived behavior control or self efficacy as being the three determinants of intention to perform a given behavior (Sutton, 1998). Meta analysis by Sutton (1998) indicated that predicting intentions from attitudes, subjective norms and self efficacy show reasonable
consistency across studies and explain 40 to 50 percent of the variance in intention. Similarly, in a relatively current meta analysis regarding adolescent sexual intentions, Buhi and Goodson (2007) found that twelve out of the twenty-four studies indicated that positive or permissive attitudes toward sex were positively associated with intention to have sex. Similarly, the twelve studies from Buhi and Goodson’s research indicated that adolescents who perceived that their friends held less favorable norms towards having sex also had weak intentions to have sex. The same studies reported that adolescents’ positive attitudes towards abstinence were associated with decreased intentions to have sex (Buhi & Goodson, 2007). Pertaining to self efficacy, Goh, Primavera and Bartalini (1996) found that self efficacy for contraceptive usage was positively related to adolescent intentions to engage in AIDS preventive behaviors including abstaining from sex and using condoms during intercourse.

Previous research has further indicated that intentions are an immediate determinant of behaviors. Azjen (1988) reported high positive correlations between intention and behavior for a variety of behaviors including marijuana usage and church attendance. A meta analysis of 87 studies by Sheppard, et.al (1988) found that the overall intention behavior relationship had a relatively large effect size. A meta analysis by Sutton (1998) also showed that intention, while being more variable, predicted 19 to 38 percent of the variance in behavior. Similarly, Sheeran (2002) further conducted a meta analysis of ten meta analyses on intention research and concluded that intentions had a large effect size when predicting behaviors, accounting for 28 percent of the variance in behaviors.

Regarding sexual behaviors, in a meta analysis of studies of condom use, Sheeran, Abraham and Orbell (1999) found that condom use intentions positively predicted condom use behavior. Meta analysis by Buhi and Goodson (2007) report that intention to have sex was
positively associated with sexual intercourse, intercourse initiation, participation in sexual behaviors and being involved in progressively riskier sexual situations. In addition, the researchers did not find any study that identified intention as being unrelated to adolescent sexual activity. Carvajal et.al (2005) further note that intention to use a condom to negatively predicts having unprotected sex.

**Summary and Conclusions**

The previous literature review presents a cumulative set of findings that support the following conclusions. First, adolescents in the United States are at risk for sexually transmitted infections and diseases. In some cases, these infections and risks represent both immediate and long term morbidities and in some cases early death. Second, sexually transmitted infections and diseases among adolescents can be linked to risk factors. A number of health-related theories and models offer shared predictor variables that can represent traditional risk factors, including risk associated with unhealthy attitudes, norms, perceptions of self efficacy [behavioral control], and behavioral intentions. The multiple domain model further offers sensation seeking and impulsive decision making as predictor variables that can represent risks among adolescents. Third, as previously emphasized, there is a high prevalence of sexual content across popular mass media. Communication theories and prior research findings indicate that adolescents’ recurring exposure to sexual content across multiple media outlets can cultivate and prime sexual perceptions and expectations, and can conceivably reduce sexual inhibitions. Through exposure to sexual media contents young audiences’ can also learn unhealthy sexual behaviors. In some cases the learning can result from adolescents viewing the media as a “super peer.” Fourth, in recent years researchers have found linkages among the traditional risk factors, plus impulsive decision making, sensation seeking, exposure to popular media and perceptions of media contents. Empirical studies have specifically shown linkages between:
(a) actual behaviors and behavioral intentions,
(b) behavioral intentions and attitudes, norms, and self efficacy,
(c) attitudes and impulsive decision making, and perceptions of media messages,
(d) perceived norms and impulsive decision making, sensation seeking, and perceptions of media messages,
(e) self efficacy and impulsive decision making and perceptions of media messages, and
(f) perceptions of media messages and mass media exposure and sensation seeking.

These theoretical and exploratory empirical studies have linked theories found in the health, social psychological and communication literatures. These linkages have special importance since numerous studies indicate that theory based health interventions are more likely to have a greater impact (Fisher & Fisher, 1992; Noar, 2007b). The more that researchers can learn about the determinants of health-related behaviors, such as sexual risk taking, the more likely it is that policy-makers and practitioners can better understand the phenomena, develop and implement effective interventions.

**Study Hypotheses and Proposed Model**

As indicated previously, a primary objective for this study is to offer a rationale for a more inclusive model integrating two mass media-related variables with five traditional health risks factors that currently appear in the literature. This study examines the effects of adolescent exposure to mass media and their perceptions of media messages within the context of other traditional factors associated with risky, unsafe sexual behaviors. Replicating and extending prior theoretical models, particularly the multiple domain model (Zimmerman, et al., 2007), the proposed model (Figure 1) integrates a number of theoretical perspectives. The general study propositions and the specific hypotheses generated from the propositions are as follows:

**Proposition 1:** Adolescents’ mass media exposure is a positive function of sensation seeking (c.f., Arnett, 1995; Krcmar & Greene, 1999).

**H1:** Adolescents who are high sensation seekers will be more likely to have high exposure to mass media.
Proposition 2: Adolescents’ perceptions that media messages encourage sexual behaviors are a positive function of (a) sensation seeking and (b) mass media exposure (c.f., Aluja-Fabregat & Torrubia-Beltri, 1998; Larson, 1996).

H2a: Adolescents who are high sensation seekers will be more likely to perceive that mass media messages encourage sexual behaviors.

H2b: Adolescents who have high mass media exposure will be more likely to perceive that mass media messages encourage sexual behaviors.

Proposition 3: Adolescents’ permissive attitudes regarding sex are a positive function of (a) impulsive decision making (c.f., Zimmerman et.al, 2007) and (b) perceptions that media messages encourage sexual behavior (c.f., Larson, 1996).

H3a: Adolescents who are impulsive decision makers will be more likely to have permissive attitudes regarding sex.

H3b: Adolescents who perceive that media messages encourage sexual behaviors will be more likely to have permissive attitudes regarding sex.

Proposition 4: Adolescent’s perceptions of peer norms that are risky are a positive function of (a) impulsive decision making, (b) sensation seeking and (c) perceptions that media messages encourage sexual behavior (c.f., Donohew, 2000; Zimmerman et.al, 2007).

H4a: Adolescents who are impulsive decision makers will be more likely to have perceptions of peer norms that are risky.

H4b: Adolescents who are high sensation seekers will be more likely to have perceptions of peer norms that are risky.

H4c: Adolescents who perceive that mass media messages encourage sexual behaviors will be more likely to have perceptions of peer norms that are risky.

Proposition 5: Adolescent’s perceptions of their sexual self efficacy are a negative function of (a) impulsive decision making (c.f., Zimmerman et.al, 2007), and (b) perceptions that media messages encourage sexual behavior.

H5a: Adolescents who are impulsive decision makers will be less likely to have high self efficacy.

H5b: Adolescents who perceive that mass media messages encourage sexual behaviors will be less likely to have high self efficacy.
Proposition 6: Adolescent sexual intentions that are risky are a positive function of (a) permissive attitudes regarding sex and (b) perceptions of peer norms that are risky, and a negative function of (c) sexual self efficacy (c.f., Azjen, 1985, 1988; Lewis, Ross & Mirowsky, 1999; Sheeran, Abraham & Orwell, 1999; Sutton, 1998).

H6a: Adolescents who have permissive attitudes regarding sex will be more likely to have sexual intentions that are risky.

H6b: Adolescents who have perceptions of peer norms that are risky will be more likely to have sexual intentions that are risky.

H6c: Adolescents who have high self efficacy will be less likely to have sexual intentions that are risky.

Proposition 7: Adolescent sexual behaviors that are risky are a positive function of sexual intentions that are risky (c.f., Azjen, 1988; Sheppard, et.al, 1988).

H7a: Adolescents who have sexual intentions that are risky will be more likely to have sexual behaviors that are risky.

Figure 1 summarizes the proposed research hypotheses. In addition to these specific hypotheses, an exploratory analysis will also be undertaken in order to determine whether there are any detectable gender differences in the overall model.
Figure 1: Hypothesized risky sexual behavior model: Influence of media related risk factors and other established risk factors on sexually risky behaviors.
CHAPTER 3
METHODOLOGY

Background

An important and accessible place to explore adolescent behaviors is by mining existing data sets (Fischhoff, Nightingale, & Iannotta, 2001). Therefore, this study examines the research propositions and hypotheses through a secondary data analysis of the Teen Media and Health Survey (L’Engle, Pardun & Brown, 2004). The Teen Media and Health Survey was a five-year project that has been funded by the National Institute of Child Health and Human Development examining the effects of a range of media on adolescents’ sexual health. Adolescents were first interviewed in the spring and summer of 7th or 8th grade. The study was initially approved by the Rand human subjects protection committee (Chandra et al., 2008). It was also reviewed and approved by the Florida State University human subjects committee on February 12, 2010.

Sampling Frame and Data Collection

Adolescents were initially recruited from 14 public middle schools in the Southeastern United States. Brief informational sessions inviting students to complete a media use survey were held at each school in fall 2001. Approximately 3,000 7th and 8th grade students returned the media survey with parental consent (Brown & L’Engle, 2009). From the initial 3,000 respondents, a balanced, stratified random sample of 1,200 students was selected to complete a detailed health survey in their homes. This balanced sample had approximately equal numbers of males/females and white/black students. The baseline sample contained 1,074 surveys completed in spring 2002. A follow-up survey was administered two years later, in spring 2004.
The follow-up data collection was also completed in respondents’ homes and resulted in 1,017 surveys.

Prior to completing the in home survey questionnaires, the parents/guardians and the sample adolescents signed consent forms guaranteeing their confidentiality. The questionnaires required approximately 45 minutes to complete. The sample adolescents completed the questionnaires using an Audio-Computer Assisted Self Interview (Audio-CASI) program. This program allowed participants to answer survey questions on a laptop computer while hearing questions through private earphones and then touching the computer screen to respond. Adolescents were paid 20 dollars for their participation (Brown & L’Engle, 2009).

Data for this secondary analysis came from respondents who participated in both health surveys, resulting in a final merged baseline/follow up data set. The merged sample data provided responses to seven predictor risk indices regarding (1) impulsive decision making, (2) sensation seeking, (3) mass media exposure, (4) perceptions that media messages encourage sexual behaviors, (5) permissive attitudes regarding sex, (6) perceptions of peer norms that are risky, and (7) sexual self efficacy. The sample data also provided two predicted indices - a predicted intervening measure of sexual intentions that are risky, and a final predicted outcome measure of sexual behaviors that are risky.

Following a listwise deletion procedure, the merged sample contained survey items completed by a total of 712 respondents. The final set of respondents represented a balanced sample, divided into approximately equal groups of males (n = 361) and females (n = 351). This sample was also balanced between white (n = 478) and black (n = 489) student respondents.

**Measurement of Variables**
The baseline and follow-up Teen Media Health Survey questionnaires comprised of over 300 items. This secondary analysis concentrated on a subset of the total TMHS survey questions. As indicated previously, a total of nine indices were created from the merged survey items to capture the predictor risk factors and predicted outcome measures. The items and indices in this secondary analysis follow the index construction techniques and indices used by Brown and L’Engle (2009) in their study of sexual attitudes and behaviors. The unidimensionality of the indices were confirmed by principal component analysis with a varimax rotation. Factor loadings for the items in the nine indices were in the 0.50 or higher range and were considered acceptable (Floyd & Widaman, 1995). The following section details the conceptual and operational measures of the predictor and predicted indices. The specific items in the questionnaire pertaining to the study can also be found in Appendix A.

Impulsive Decision Making

Impulsive decision making was measured in the baseline survey and has been conceptualized as a deficit in decision-making that results in a failure to delay gratifications and evaluate the outcomes of planned actions (c.f., Bechara, 2004). Impulsive decision makers tend to make a response before all the necessary information has been obtained and act without thinking (c.f., Evenden, 1999). This index was operationalized using four-point Likert type items (anchor points - - - never, sometimes, often, always):

1. “when I do something I think about all of my choices very carefully,”
2. “I do whatever is the most fun,”
3. “when I do something I consider if it will be good or bad for my future,” and
4. “I do whatever feels good.”
Items one and three were recoded in to a final summed and averaged index. These items and the summed index follow the impulsive decision making index were previously reported by Brown and L’Engle (2009).

**Sensation Seeking**

Sensation seeking was also measured in the baseline survey and has been conceptualized as a desire for intense and novel experiences (c.f., Zuckerman, 1994). The sensation seeking index in the Teen Media Health Survey is assessed by using three five-point Likert scale (anchor points - - - strongly disagree, disagree, no opinion, agree, strongly disagree). The items measuring the sensation seeking concept are:

1. “I prefer friends who are exciting and unpredictable;”
2. “I like to do scary things” and
3. “I like new and exciting experiences, even if I have to break the rules.”

Once again, these items and the summed index similarly follow the sensation seeking index previously used by Brown et.al (2006) and Brown and L’Engle (2009).

**Mass Media Exposure**

Mass media exposure was measured in the baseline survey. Several measures of media were included in the questionnaire.

Mass media exposure is typically viewed as a collective set of self-reported overt behaviors (c.f., Brown & L’Engle, 2009). For this study mass media exposure is analyzed using 11 Likert-type items. The first 3 items assess the respondents’ exposure to television, Internet and music during the school year using the following items (anchor points - - - never, once in a while, sometime, frequently, almost all the time while not in school):

1. “how often do you watch TV Mondays through Fridays during the school year,”
(2) “how often do you use the Internet Mondays through Fridays during the school year,”

(3) “how often do you listen to music Mondays through Fridays during the school year.”

The next 3 items assess respondents’ exposure to television, Internet and music on the weekends during the school year using Likert-type items (anchor points - - - never, once in a while but not every weekend, about one time during the weekend, about once of Saturday and once on Sunday, several time throughout the weekend, almost the whole weekend). The specific items are:

(4) “how often do you watch TV on Saturdays and Sundays during the school year,”

(5) “how often do you use the Internet on Saturdays and Sundays during the school year,”

(6) “how often do you listen to music on Saturdays and Sundays during the school year,”

The following 3 items further assess the respondent’s exposure to television, Internet and music during the summer months (anchor points - - - never, once a week, less than two or three times a week, almost every day, at least once every day, almost all the time). The specific items are:

(7) “how often do you watch TV throughout the week during the summer months,”

(8) “how often do you use the Internet throughout the week during the summer months,”

(9) “how often do you listen to music throughout the week during the summer months.”

The last two items assess the frequency of watching movies (anchor points - - - never, about once every other month or less, about once a month, a few times a month, about once a week or more). The specific items are:

(10) “how often do you watch movies on VCR, DVD or Pay per view,”

(11) “how often do you see movies in the movie theatre.”

These items have been used by Brown and Pardun (2004) and L’Engle, Jackson and Brown (2006) as a part of their adolescent media diet index.
Perceptions that Media Messages Encourage Sexual Behavior

Perceptions that media messages encourage sexual behavior was measured in the follow up survey. It was conceptualized as the extent to which adolescents perceive that media provides them with “permission” to have sex (Brown et.al, 2005). The index combines the following five-point Likert scale items (anchor points - - - strongly disagree, disagree, no opinion, agree, strongly agree):

(1) “the messages I get from TV are that it’s OK for people my age to have sex,”
(2) “the messages I get from movies are that it’s OK for people my age to have sex,”
(3) “the messages I get from Internet sites are that it’s OK for people my age to have sex,”
(4) “the messages I get from music artists are that it’s OK for people my age to have sex” and
(5) “the messages I get from the media are that I should use condoms if I have sex.”

Item 5 was recoded, the items were then summed and averaged. These items have been previously use by Brown et.al (2005) to create a similar index called “perceived sexual permission” from the media index. However, the index for the current study also includes the messages from the Internet. Brown et.al (2005) did not use the Internet item for their study index.

Permissive Attitudes Regarding Sex

Permissive attitudes regarding sex was measured in the follow up survey. It was conceptualized as adolescent beliefs about appropriate sexual behaviors (c.f.,Brown & L’Engle, 2009). The attitude towards sex index comprises seven items with a five-point scale, (anchor
points - - - strongly disagree, disagree, no opinion, agree, strongly agree). The variable is assessed with items such as:

1. “I believe it is OK for people my age to have sex on the first date,”
2. “I believe it is OK for people my age to have sex with a steady boyfriend or girlfriend,”
3. “I believe it is OK for people my age to have sex before marriage if they are in love,”
4. “I believe people should not have sex before marriage,”
5. “It doesn’t matter who you have sex with as long as you enjoy it,”
6. “It’s important to be in love with a person you have sex with” and,
7. “I believe it is OK for people my age to have oral sex.”

Item 4 was recoded into a summed and averaged index.

**Perceptions of Peer Norms that are Risky**

Perceptions of peer norms [normative beliefs] that are risky, some of which present clear risk and others which have some risk potential, were measured in the follow up survey and were conceptualized as an individual’s estimation of beliefs that are held by an individual’s peers, and the approval or disapproval of sexual behaviors by peers (c.f., Siman, 1977). The index for sexual norms combines responses to questions regarding feelings among friends about having “sex at this time” and norms on condom usage. The first three items measure the respondents’ perceptions of how his/her friends will feel about his/her’s sexual behaviors (anchor points - - - strongly disapprove, disapprove, have no opinion, approve, strongly approve). The items are:

1. “how would your friends feel about you having sex at this time in your life,”
2. “if you have been going out with someone for a while, it’s expected that you are having sex with that person,”
(3) “my friends believe that I should use condoms if I have sex.”

The next set of items also measure respondents’ perceptions of peer norms. The anchor points for these items are definitely yes, probably yes, no opinion, probably not, and definitely not. The specific items are:

4) “most of my friends think it’s important to have a boyfriend/girlfriend or to be going out with someone,”

5) “most of my friends believe it’s important for people my age to remain virgins,”

6) “most of my friends believe condoms should be used even if the two people know each other very well,”

7) “most of my friends believe it’s ok for people my age to have oral sex.”

Item 3, 4, and 7 were reverse coded. They were recoded into a summed and averaged index.

**Sexual Self Efficacy**

Sexual self efficacy was measured in the follow up survey and has been conceptualized as an individual’s belief in his/her capabilities to perform or master specific actions and to control specific [sexual] situations. (c.f., Bandura, 1997). The index for self efficacy combines responses to questions regarding sexual self efficacy and contains items concerning:

1) refusal to have sex if the respondent does not feel ready (anchor points: not at all sure, not very sure, somewhat sure, quite sure, extremely sure),

2) comfort level in convincing sexual partners to use a condom (anchor points: very comfortable, comfortable, uncomfortable, very uncomfortable),

3) comfort level in purchasing condoms (anchor points: very comfortable, comfortable, uncomfortable, very uncomfortable), and
(4) use of condom in the sexual act (anchor points: very comfortable, comfortable, uncomfortable, very uncomfortable).

The items were summed and averaged for the final index.

Sexual Intentions that are Risky

Sexual intention was measured in the follow up survey and was conceptualized as an adolescent’s future aim to engage in sexual activities (c.f., Pardun et al., 2005). The index of sexual intentions combines responses to four, four-point Likert items (anchor points: very unlikely, unlikely, likely, very likely) regarding sexual intentions such as:

1. likeliness of having sex in the next year,
2. likeliness of having sex in high school,
3. discussing STD/AIDS with their partner, and
4. likeliness of using a condom when having sex in the future.

Item 3 and 4 were reverse coded and recoded for the final summed and averaged index. The index followed the sexual intentions index by reported by Pardun et al., (2005).

Sexual Behaviors that are Risky

Sexual risk behaviors have been defined in various ways (c.f., Bailey, Fleming, Henson, Catalano, & Haggerty, 2008; Buhi & Goodson, 2007); however, the core conceptualization of sexual behaviors in most studies revolve around, sexual acts, condom usage and frequency of sexual intercourse (c.f., L’Engle et al., 2006; Luster & Small, 1994). The index is comprised of thirteen dichotomous items gauging risky behavior by the number of risky sexual acts performed (from low risk (i.e., had a crush on a girl/guy) to a high risk sexual act (i.e., had sex with more than one person, without a condom). The thirteen items are given in Appendix A. The variable was constructed in a cumulative fashion. Thus, a respondent with a score of 1 reported only one,
very low risk behavior (i.e., “had a crush on a guy/girl”). A respondent with a score of 2 (1) “had a crush on a guy/girl” and (2) “dated or went out with a girl/guy at least once.” A respondent with a score of 3 (1) “had a crush on a guy/girl” and (2) “dated or went out with a girl/guy at least once” and had (3) “been in a private place without any adults around with just one guy/girl that he/she is attracted to” and so forth. The cumulative sequence can be found in the Appendix. A score of 13 is the highest value, indicating a respondent who has had experience with all 13 risks. This study follows L’Engle, et.al (2006) assessment of sexually risky behaviors.

**Statistical Procedures**

This secondary analysis examines the seven hypothesized relationship propositions summarized in Figure 1. The hypothesized relationship paths were tested using a structural equation model (SEM). The data in this SEM are analyzed to determine the extent to which the proposed model and hypotheses explain the variation in risky sexual behaviors. Previous researchers have used SEM to conduct and test similar relationships between multiple endogenous and exogenous variables (c.f., Holbert and Stephenson (2002).

Stephenson, Holbert and Zimmerman (2006) note that although there are a number of viable ways to analyze health communication data, SEM is particularly useful in allowing researchers to visualize and analyze communication as a component among other processes. Using a full-information maximum likelihood estimation, SEM allows the simultaneous analysis of a system of equations that represent a theoretical process that determines if the hypothesized model is consistent with the observed data (i.e., whether the model fits). The SEM directly contrasts the traditional general linear model (GLM)-based approaches such as multiple regression that employ partial-information ordinary least squares estimators that solve systems of
equations one by one, not as a system of equations that can be solved simultaneously (Stephenson, Holbert & Zimmerman, 2006).

While SEM permits the testing of latent variables in the model, this research will focus on the path analysis model or the main constructs of the structural model, excluding the measurement model. The technique of path analysis involves the estimation of presumed relationships among observed variables (Kline, 2005). A path analysis for the study is appropriate since the goal of this research is to examine the presumed relationships between the predictors at time 1 and the predicted variables at time 2 and test the fit of the model.

The software packages used for the study analyses include SPSS: 18 and Mplus: 6. The data from year 2002 and year 2004 were merged using SPSS. SPSS was used to generate the summary descriptive measures and reliability coefficients. Mplus was used to test the hypothesized paths and the goodness of fit for the overall models. The maximum likelihood with robust standard errors and chi square (MLR) is used to obtain the path analysis results in Mplus. The MLR is commonly used to test the relationships between endogenous and exogenous variables that have complex designs. This method is also robust to non normality or measurement violations (Muthen & Muthen, 2010).

Overidentified path models with more observations than parameters usually do not fit the data. Thus, there is a need to measure the degree of fit of such models. Fit indices can be used to examine alternative models that can match the data better than the original hypothesized models. There are a number of established and emerging model fit indexes in the SEM literature. Kline (2005) underscores a set of established fit indexes, reflecting the current state of practice and recommendations, which should be reported and interpreted when reporting the results of SEM analysis. These statistics include (1) the model chi-square ($X^2$), (2) the Bentler comparative fit
index (CFI), (3) the Tucker-Lewis Index (TLI), (4) the Steiger-Lind root mean square error of approximation (RMSEA), and (5) the standardized root mean square residual (SRMR).

Regarding the chi-square fit, there are no clear guidelines for chi-square values that are minimally acceptable (Kline, 2005). As the value of chi-square increases, the fit of the model becomes worse (Kline, 2005). Ideally, the model will have a low chi-square value with a non-significant probability level. A non-significant chi-square test indicates that the model fits the sample data.

The TLI index can be used to compare alternative models and is an index that prefers simpler models (Schumacker, 1992). In situations where small samples are used, the value of the TLI can indicate poor fit despite other statistics pointing towards good fit (Bentler, 1990; Kline, 2005; Tabachnick and Fidell, 2007). A problem with the TLI is that due to its non-normed nature, values can go above 1.0 and can thus be difficult to interpret (Byrne, 1998). Recommendations as low as 0.80 have been recommended, however, Hooper, Coughlan, and Mullen (2008) have suggested TLI ≥ 0.95 as the threshold.

The RMSEA measures the error of approximation concerning the lack of fit of the model to the population covariance matrix. A RMSEA less than .05 indicates “close approximate fit” (Kline, 2005, p. 139). Values between .05 and .08 suggest “reasonable fit” (Kline, 2005, p. 139).

The SRMR is a measure of the mean absolute correlation residual, or the overall difference between the observed and predicted correlations. It is used to compare the fit of two different models with the same data (Schumacker, 1992). SRMR values less than 0.10 are generally considered favorable (Kline, 2005).

Finally, according to Holbert and Stephenson (2002), the coefficient of determination ($R^2$) in health communication can be relatively small due to the complex array of variables in
communication and social sciences. Therefore, a coefficient of determination equal to five percent can be considered significant (Jaccard, 1998). The relative importance of the $R^2$ coefficient will be determined within the context of the model without pre-establishing a cutoff point.
CHAPTER 4
RESULTS

This chapter provides a summary of the survey data, the fit indices and the path analysis coefficients for the proposed risky sexual behavior model found in Figure 1.

Sample Demographics of Survey Respondents

The total sample size for the study was 712 respondents. Sample sizes and demographic characteristics for the respondents used to test the risky sexual behavior model are provided in Table 1. Sample respondents ages ranged from 12-17 years. Mean age for the sample at baseline year (2002) was 13.6, and mean age for the sample at follow-up year (2004) was 15.6. The sample was stratified according to gender and race and had roughly equal numbers of male and female respondents (n = 361 males, 351 females) and equal numbers of white and Black students (478 and 489, respectively).

Table 1

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>13.612</td>
<td>15.581</td>
</tr>
<tr>
<td>SD</td>
<td>0.700</td>
<td>0.700</td>
</tr>
<tr>
<td>Median</td>
<td>14.000</td>
<td>16.000</td>
</tr>
<tr>
<td>Mode</td>
<td>14.000</td>
<td>16.000</td>
</tr>
<tr>
<td>Range</td>
<td>12-15</td>
<td>14-17</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>50.7%</td>
<td>50.7%</td>
</tr>
<tr>
<td>Female</td>
<td>49.3%</td>
<td>49.3%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>51.0%</td>
<td>51.0%</td>
</tr>
<tr>
<td>White</td>
<td>49.0%</td>
<td>49.0%</td>
</tr>
</tbody>
</table>
Descriptive Analysis of Study Indices

Table 2 provides the Cronbach’s alpha reliabilities for the predictor and predicted indices in the risky sexual behavior model. Principal component analysis confirmed the unidimensionality of the indices. The reliabilities corresponding to the indices for permissive attitudes regarding sex (α = 0.845), perceptions of peer norms that are risky (α = 0.812), sexual self efficacy (α = 0.782), perceptions that media messages encourage sexual behaviors (α = 0.781) were relatively high (Reinard, 2006). The indices for mass media exposure (α = 0.702), impulsive decision making (α = 0.678), sensation seeking (α = 0.626), sexual intentions that are risky (α = 0.699) and sexual behaviors that are risky (α = 0.683) were somewhat less reliable, thus potentially attenuating the study results.

Table 2

<table>
<thead>
<tr>
<th>Indices</th>
<th>Number of items</th>
<th>Cronbach's alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impulsive decision making</td>
<td>4</td>
<td>0.678</td>
</tr>
<tr>
<td>Sensation seeking</td>
<td>3</td>
<td>0.626</td>
</tr>
<tr>
<td>Mass media exposure</td>
<td>11</td>
<td>0.702</td>
</tr>
<tr>
<td>Perceptions that media messages encourage sexual behaviors</td>
<td>5</td>
<td>0.781</td>
</tr>
<tr>
<td>Permissive attitudes regarding sex</td>
<td>7</td>
<td>0.845</td>
</tr>
<tr>
<td>Perceptions of peer norms that are risky</td>
<td>8</td>
<td>0.812</td>
</tr>
<tr>
<td>Sexual self efficacy</td>
<td>4</td>
<td>0.782</td>
</tr>
<tr>
<td>Sexual intentions that are risky</td>
<td>4</td>
<td>0.699</td>
</tr>
<tr>
<td>Sexual behaviors that are risky</td>
<td>13</td>
<td>0.683</td>
</tr>
</tbody>
</table>
Table 3 presents the descriptive statistics for the predictor and predicted indices in the risky sexual behavior model.

The mean index scores for the predictor variables were typically around the mid points of their potential ranges: impulsive decision making (2.231), sensation seeking (3.414), mass media exposure (3.880), perceptions that media messages encourage sexual behaviors (3.567), permissive attitudes regarding sex (3.214), perceptions of peer norms that are risky (2.908), and sexual self efficacy (2.839). The predicted sexual intentions that are risky index had a mean score of 1.817, with a range of 1 (“not risky”) to “3.750 (“somewhat risky”). Lastly, the predicted index for sexual behaviors that are risky had a mean of 8.746 where a score of 0 indicated that the respondents had not performed or experienced any of the 13 sexual risks and a score of 13 indicated that the respondents had performed or experienced all of the sexual risks.

Table 3
Descriptive Statistics for Predictor and Predicted Indices in the Risky Sexual Behavior Model, Total Sample (n =712)

<table>
<thead>
<tr>
<th>Indices</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>Std. Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impulsive decision making</td>
<td>2.231</td>
<td>2.333</td>
<td>2.330</td>
<td>0.482</td>
<td>1.000</td>
<td>4.000</td>
</tr>
<tr>
<td>Sensation seeking</td>
<td>3.414</td>
<td>3.000</td>
<td>2.272</td>
<td>0.806</td>
<td>1.000</td>
<td>5.000</td>
</tr>
<tr>
<td>Mass media exposure</td>
<td>3.880</td>
<td>3.909</td>
<td>3.730</td>
<td>0.622</td>
<td>1.820</td>
<td>5.000</td>
</tr>
<tr>
<td>Perceptions that media messages encourage sexual behaviors</td>
<td>3.567</td>
<td>3.750</td>
<td>4.000</td>
<td>0.214</td>
<td>1.000</td>
<td>5.000</td>
</tr>
<tr>
<td>Permissive attitudes regarding sex</td>
<td>3.214</td>
<td>3.100</td>
<td>3.150</td>
<td>0.959</td>
<td>1.000</td>
<td>5.000</td>
</tr>
<tr>
<td>Perceptions of peer norms that are risky</td>
<td>2.908</td>
<td>2.900</td>
<td>2.880</td>
<td>0.685</td>
<td>1.000</td>
<td>4.500</td>
</tr>
<tr>
<td>Sexual self efficacy</td>
<td>2.839</td>
<td>2.667</td>
<td>2.330</td>
<td>0.641</td>
<td>1.000</td>
<td>4.330</td>
</tr>
<tr>
<td>Sexual intentions that are risky</td>
<td>1.817</td>
<td>1.750</td>
<td>1.750</td>
<td>0.213</td>
<td>1.000</td>
<td>3.750</td>
</tr>
<tr>
<td>Sexual behaviors that are risky</td>
<td>8.746</td>
<td>8.000</td>
<td>6.000</td>
<td>0.548</td>
<td>0.000</td>
<td>13.000</td>
</tr>
</tbody>
</table>
Table 4 provides the Pearson’s correlation coefficients among the predictor and predicted indices in the risky sexual behavior model. The significant correlations among the indices ranged from 0.125 to 0.683. These highest observed correlations for the hypothesized relationships were .518 (permissive attitudes towards by sexual intentions that are risky); .520 (sexual intentions that are risky by sexual behaviors that are risky ) and .679 (permissive attitudes towards sex by perceptions of peer norms that are risky). Counter to expectations, the hypothesized correlations between sensation seeking and perceptions that media messages encourage sexual behaviors (.006), and impulsive decision making and sexual self efficacy (-.028) were not statistically significant.

Table 4

<table>
<thead>
<tr>
<th>Indices</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Impulsive decision making</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Sensation seeking</td>
<td>0.348*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Mass media exposure</td>
<td>0.027</td>
<td>0.371*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Perceptions that media messages encourage sexual behaviors</td>
<td>0.046</td>
<td>0.006</td>
<td>0.683*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Permissive attitudes towards sex</td>
<td>0.276*</td>
<td>0.081</td>
<td>0.128*</td>
<td>0.499*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Perceptions of peer norms that are risky</td>
<td>0.489*</td>
<td>0.313*</td>
<td>0.082</td>
<td>0.196*</td>
<td>0.679*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Sexual self efficacy</td>
<td>-0.028</td>
<td>-0.004</td>
<td>-0.079</td>
<td>-0.145*</td>
<td>-0.125*</td>
<td>-0.144*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Sexual intentions that are risky</td>
<td>0.017</td>
<td>0.067</td>
<td>0.074</td>
<td>0.113*</td>
<td>0.518*</td>
<td>0.462*</td>
<td>-0.271*</td>
<td></td>
</tr>
<tr>
<td>9. Sexual behaviors that are risky</td>
<td>0.012</td>
<td>0.022</td>
<td>0.198*</td>
<td>0.217*</td>
<td>0.413*</td>
<td>0.429*</td>
<td>-0.199*</td>
<td>0.520*</td>
</tr>
</tbody>
</table>

Note: * p < 0.05
Fit Indices and Hypothesis Testing

**Fit Indices**

Kline (2005) offers a set of fit indices that should be reported and interpreted when reporting the SEM results. These fit indices include (a) model chi-square, (b) CFI, (c) RMSEA and (d) SRMR. This particular set reflects the current state of practice and recommendations about what to report in written summaries of the analysis (McDonald & Ho, 2002). In addition, the TLI will also be reported since it can be used to compare alternative or intermediate models.

Initially, all variables were entered into a structural equation model according to the hypothesized structure described in Figure 1. This model had a relatively poor fit ($X^2 = 506.83$, $df = 170$, $p = 0.080$) with CFI at 0.819, TLI at 0.803, RMSEA at 0.030 and SRMR at 0.038 (Table 5). In addition, Table 6 presents the unstandardized paths corresponding to the original hypothesized model. All non significant paths beginning with the smallest unstandardized variable were dropped. Using this procedure, the path from sensation seeking to perceptions that media messages encourage sexual behavior and the path from impulsive decision making to sexual self efficacy were removed.

Results for the final revised model are given in Table 5. The model fit was adequate as assessed by the fit indices ($X^2 = 181.349$, $df = 130$, $p = 0.520$) with CFI at 0.998, TLI at 0.989, RMSEA at 0.001 and SRMR at 0.044.
Table 5

<table>
<thead>
<tr>
<th>Model</th>
<th>$X^2$, df, p</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original hypothesized model</td>
<td>506.83, df=170, p=0.080</td>
<td>0.819</td>
<td>0.803</td>
<td>0.030</td>
<td>0.038</td>
</tr>
<tr>
<td>Intermediate revised model</td>
<td>225.683, df=145, p=0.550</td>
<td>0.983</td>
<td>0.978</td>
<td>0.005</td>
<td>0.029</td>
</tr>
<tr>
<td>Final revised model</td>
<td>181.349, df=130, p=0.520</td>
<td>0.998</td>
<td>0.989</td>
<td>0.001</td>
<td>0.044</td>
</tr>
</tbody>
</table>

Note: The Intermediate Revised Model is based on removing one non-significant path: (1) Sensation seeking to Perceptions that media messages encourage sexual behaviors. The Final Revised Model is based on removing two non-significant paths: (1) Sensation seeking to Perceptions that media messages encourage sexual behaviors and (2) Impulsive decision making to Sexual self efficacy.

Hypothesis Testing

The propositions and hypotheses concurrent with Figure 1 are analyzed in Table 6, Table 7 and Table 8. The results for the final revised model are reported in Table 7 and Table 8 and are also summarized in Figure 2 and Figure 3 respectively. As indicated earlier, Table 6 presents the unstandardized paths corresponding to the original hypothesized model. Table 7 provides the unstandardized (B) path analysis coefficients for the final revised risky sexual behavior model. Table 8 presents the standardized (β) path analysis coefficients for the same model. Due to the difference in scales, the unstandardized estimates for the different variables (Tables 6 & 7) cannot be directly compared (Kline, 2005). In addition, it is difficult to conceptually comprehend what it might mean to have a one point increase in, for example, permissive attitudes towards sex. However, scale differences are not as problematic for standardized solutions (Kline, 2005). Therefore, the following analyses with emphasize the standardized (β) coefficients reported in Table 8.
Table 6
*Unstandardized (B) Path Analysis Coefficients and (Standard Errors) for the Original Hypothesized Risky Sexual Behavior Model, Total Sample (n=712)*

<table>
<thead>
<tr>
<th>Predictor Indices</th>
<th>Impulsive decision making</th>
<th>Sensation seeking</th>
<th>Mass media exposure</th>
<th>Perceptions that media messages encourage sexual behaviors</th>
<th>Permissive attitudes regarding sex</th>
<th>Perceptions of peer norms that are risky</th>
<th>Sexual self efficacy</th>
<th>Sexual intentions that are risky</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass media exposure</td>
<td>0.682* (0.068)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceptions that media messages encourage sexual behaviors</td>
<td>0.009 (0.098)</td>
<td>4.216* (0.037)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permissive attitudes regarding sex</td>
<td>0.214* (0.062)</td>
<td></td>
<td>1.066* (0.083)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceptions of peer norms that are risky</td>
<td>0.296* (0.078)</td>
<td></td>
<td>1.916* (0.079)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual self efficacy</td>
<td>0.052 (0.015)</td>
<td></td>
<td>-1.108* (0.045)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual intentions that are risky</td>
<td></td>
<td></td>
<td>1.295* (0.086)</td>
<td>0.847* (0.098)</td>
<td>-1.921* (0.039)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual behaviors that are risky</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.546* (0.072)</td>
</tr>
</tbody>
</table>

*Note. These B coefficients reflect the Original Hypothesized Model in Table 5.*

* *p ≤ 0.05
Table 7
Unstandardized (B) Path Analysis Coefficients and (Standard Errors) for the Final Revised Risky Sexual Behavior Model, Total Sample (n=712)

<table>
<thead>
<tr>
<th>Predictor Indices</th>
<th>Impulsive decision making</th>
<th>Sensation seeking</th>
<th>Mass media exposure</th>
<th>Perceptions that media messages encourage sexual behaviors</th>
<th>Permissive attitudes regarding sex</th>
<th>Perceptions of peer norms that are risky</th>
<th>Sexual self efficacy</th>
<th>Sexual intentions that are risky</th>
<th>Sexual behaviors that are risky</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted indices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass media exposure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.682* (0.068)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceptions that media messages encourage sexual behaviors</td>
<td></td>
<td></td>
<td></td>
<td>4.267* (0.037)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permissive attitudes regarding sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.422* (0.083)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceptions of peer norms that are risky</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.916* (0.079)</td>
<td></td>
</tr>
<tr>
<td>Sexual self efficacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-1.108* (0.045)</td>
<td></td>
</tr>
<tr>
<td>Sexual intentions that are risky</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.282* (0.086)</td>
<td>2.837* (0.098)</td>
</tr>
<tr>
<td>Sexual behaviors that are risky</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.546* (0.072)</td>
</tr>
</tbody>
</table>

Note. These B coefficients reflect the Final Revised Model in Table 5.
* p ≤ 0.05
Table 8
Standardized (β) Path Analysis Coefficients and (Standard Errors) for the Final Revised Risky Sexual Behavior Model, Total Sample (n=712)

<table>
<thead>
<tr>
<th>Predictor Indices</th>
<th>Impulsive decision making</th>
<th>Sensation seeking</th>
<th>Mass media exposure</th>
<th>Perceptions that media messages encourage sexual behaviors</th>
<th>Permissive attitudes regarding sex</th>
<th>Perceptions of peer norms that are risky</th>
<th>Sexual self efficacy</th>
<th>Sexual intentions that are risky</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass media exposure</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td>0.138</td>
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<tr>
<td>Perceptions that media messages encourage sexual behaviors</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.466</td>
</tr>
<tr>
<td>Permissive attitudes regarding sex</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>0.082</td>
</tr>
<tr>
<td>Perceptions of peer norms that are risky</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.103</td>
</tr>
<tr>
<td>Sexual self efficacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.021</td>
</tr>
<tr>
<td>Sexual intentions that are risky</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.158</td>
</tr>
<tr>
<td>Sexual behaviors that are risky</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.520*</td>
<td>0.270</td>
</tr>
</tbody>
</table>

*Note: These β coefficients reflect the Final Revised Model in Table 5.

*p ≤ 0.05
**Proposition 1.** Proposition 1 has a single hypothesis. Hypothesis 1 proposes that adolescents who are high sensation seeker will be more likely to have high exposure to mass media. The result from Table 8 supports this hypothesis. The β coefficient for the path from sensation seeking to mass media is 0.371 and is statistically significant. In addition, sensation seeking explains 13.8 percent of the variance in mass media exposure (Table 8).

**Proposition 2.** Proposition 2 states that adolescent’s perceptions that media messages encourage sexual behaviors are a positive function of sensation seeking and mass media exposure. Hypothesis 2a proposes that adolescents who are high sensation seekers will be more likely to perceive that mass media messages encourage sexual behaviors. Hypothesis 2b proposes that adolescents who have high mass media exposure will be more likely to perceive that mass media messages encourage sexual behaviors. The results from the original model (Table 6) do not support hypothesis 2a. Sensation seeking did not have a significant impact on perceptions that media messages encourage sexual behaviors. As mentioned previously, the pathway was dropped from the final revised model.

In contrast, hypothesis 2b is supported by the final revised model results (Table 8). Mass media exposure in the model is a strong significant positive predictor (β = 0.683) of perceptions that media messages encourage sexual behaviors. This is one of the largest β coefficients in the model. The mass media exposure index explains nearly one-half (46.6 percent) of the variance in perceptions that media messages encourage sexual behaviors. In addition, this is a notable, time ordered, predictor relationship since mass media exposure was measured at time 1 (year 2002) and perceptions that media messages encourage sexual behaviors was measured at time 2 (year 2002).
**Proposition 3.** Proposition 3 states that adolescents’ permissive attitudes are a positive function of impulsive decision making and perceptions that media messages encourage sexual behaviors. Specifically, hypothesis 3a proposes that adolescents who are impulsive decision makers will be more likely to have permissive attitudes regarding sex; hypothesis 3b proposes that adolescents who perceived that media messages encourage sexual behaviors will be more likely to have permissive attitudes regarding sex. The hypotheses resulting from Proposition 3 are fully supported. After multivariate effects were controlled, Table 8 shows that impulsive decision making has a relative weak, though significant positive impact on permissive attitudes regarding sex ($\beta = 0.103$). This relationship also had time ordered, predictive support since impulsive decision making was measured at time 1 (year 2002) and permissive attitudes regarding sex were measured at time 2 (year 2004).

Results from Table 8 also support hypothesis 3b. Perceptions that media messages encourage sexual behavior positively predict permissive attitudes regarding sex ($\beta = 0.292$). Compared to impulsive decision making, perceptions that media messages encourage sexual behavior are a stronger predictor of permissive attitudes regarding sex. Together, the two predictor variables explain 8.2 percent of the variance in permissive attitudes regarding sex.

**Proposition 4.** The fourth proposition for the hypothesized risky sexual behavior model specifies the relationships predicting perceptions of peer norms that are risky. The resulting three hypotheses are as follows: (a) hypothesis 4a states that adolescents who are impulsive decision makers will be more likely to have perceptions of peer norms that are risky, (b) hypothesis 4b states that adolescents who are high sensation seekers will be more likely to have perceptions of peer norms that are risky and finally, (c) hypothesis 4c states that adolescents who perceived that
media messages encourage sexual behaviors will be more likely to have perceptions of peer norms that are risky.

The hypotheses associated with Proposition 4 are all fully supported. Controlling for multivariate effects, standardized coefficients from Table 8 show that impulsive decision making ($\beta = 0.341$), sensation seeking ($\beta = 0.090$) and perceptions that media messages encourage sexual behaviors ($\beta = 0.281$) are significant positive predictors of perceptions of peer norms that are risky. While sensation seeking is a significant predictor at $p \leq 0.05$, the strength of the relationship between sensation seeking and perceptions of peer norms that are risky is quite weak. The three predictors together explain 10.3 percent of the variance in perceptions of peer norms that are risky.

**Proposition 5.** This proposition states that adolescent’s sexual self efficacy is a negative function of impulsive decision making and perceptions that media messages encourage sexual behavior. Hypothesis 5a proposes that adolescents who are impulsive decision makers will be less likely to have high self efficacy. Hypothesis 5b suggests that adolescents who perceive that mass media messages encourage sexual behaviors will be less likely to have high self efficacy. Proposition 5 was partially supported. Results, reported in Table 6, did not support hypothesis 5a. The path from impulsive decision making to sexual self efficacy was not significant and was dropped from the final revised model.

In contrast, results from Table 8 suggest that perceptions that media messages encourage sexual behaviors are a significant negative predictor of sexual self efficacy ($\beta = -0.145$). However, while perceptions that media messages encourage sexual behaviors are a significant predictor of sexual self efficacy, the index only accounts for roughly two percent of the variance in sexual self efficacy.
Proposition 6. Proposition 6 states that risky sexual intentions are a function of three risk factors. Hypothesis 6a, 6b and 6c, in the respective order, proposed that (a) adolescents who have permissive attitudes regarding sex will be more likely to have sexual intentions that are risky, (b) adolescents who perceive peer norms to be risky will be more likely to have sexual intentions that are risky and, (c) adolescents who have high self efficacy will be less likely to have sexual intentions that are risky.

The results in Table 8 fully support the three hypotheses resulting from proposition 6. After controlling for multivariate effects, permissive attitudes regarding sex are the strongest predictor of sexual intentions that are risky ($\beta = 0.362$). The next strongest predictor is the perceptions of peer norms that are risky ($\beta = 0.281$), followed by the sexual self efficacy index ($\beta = -0.188$). These three determinants of sexual intentions that are risky help explain 15.8 percent of the variance in the sexual intentions that are risky variable.

Proposition 7. Similar to proposition 1, proposition 7 has a single hypothesis. The hypothesis states that adolescents who have sexual intentions that are risky will be more likely to have sexual behaviors that are risky. Results from Table 8 support the proposition and the specific hypothesis. Sexual intentions that are risky is a significant and positive predictor of sexual behaviors that are risky ($\beta = 0.520$). Moreover, intentions explain 27 percent of the variation in sexual behaviors that are risky.

The results from Table 7 and Table 8 are summarized in Figure 2 and Figure 3 respectively. These Figures represent the final revised model in Table 5 ($X^2 = 181.349$, df = 130, $p = 0.52$).
Figure 2: Revised risky sexual behavior model: Unstandardized (B) coefficients for overall sample.
Figure 3: Revised risky sexual behavior model: Standardized (β) coefficients for overall sample.
Exploratory Analysis: Gender Differences

Gender differences in risk taking have been studied by a number of researchers. From a social scientific standpoint, sex and gender differences may be of interest because they can often precipitate important theoretical advances. Byrnes, Miller and Schafer (1999) conducted a meta-analysis of 150 studies where risk taking tendencies of male and female participants were compared. The researchers found that males typically had higher risk taking tendencies in 14 out of the 16 risk taking areas. Wagner (2001) similarly reported male / female differences. Conversely, recent studies have noted that risk factors for risky sexual behaviors may be more pronounced in females than in males (Brown, Halpern & L’Engle, 2005; Brown, White & Nikopoulou, 1993; Magnusson, 2001). Most recently, in another study of an integrative model of condom use, Zimmerman et.al (2007) did not find any significant differences between male and female subsamples. This study, therefore, study included an exploratory gender comparison analysis to detect any significant differences in patterns of behavior for males and females.

Descriptive Analysis of Study Indices by Gender Subsample

Descriptive statistics for predictor and predicted indices for male and female subsamples are given in Table 9a and Table 9b. The subsample female population had 351 respondents while the subsample male population had 361 respondents.

The index means for males and females are very similar. Notably, in accordance with previous studies (Wagner, 2001), where mean index differences were observed, index values for males were often slightly higher than index values for females (c.f., sensation seeking, permissive attitudes regarding sex, and perceptions of peer norms that are risky). In addition, females had slightly lower mean index scores (7.302) than males (8.175) when reporting actual sexual behaviors that are risky.
### Table 9a

*Descriptive Statistics for Predictor and Predicted Indices in the Risky Sexual Behavior Model, Subsample Males (n=361)*

<table>
<thead>
<tr>
<th>Indices</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>Std. Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impulsive decision making</td>
<td>2.221</td>
<td>2.433</td>
<td>2.333</td>
<td>0.507</td>
<td>1.000</td>
<td>4.000</td>
</tr>
<tr>
<td>Sensation seeking</td>
<td>3.271</td>
<td>3.000</td>
<td>2.271</td>
<td>0.776</td>
<td>1.000</td>
<td>5.000</td>
</tr>
<tr>
<td>Mass media exposure</td>
<td>3.811</td>
<td>3.792</td>
<td>3.754</td>
<td>0.602</td>
<td>1.750</td>
<td>5.000</td>
</tr>
<tr>
<td>Perceptions that media messages encourage sexual behaviors</td>
<td>2.574</td>
<td>2.750</td>
<td>2.900</td>
<td>0.312</td>
<td>1.000</td>
<td>5.000</td>
</tr>
<tr>
<td>Permissive attitudes regarding sex</td>
<td>2.210</td>
<td>1.838</td>
<td>1.094</td>
<td>0.991</td>
<td>1.000</td>
<td>5.000</td>
</tr>
<tr>
<td>Perceptions of peer norms that are risky</td>
<td>1.900</td>
<td>1.896</td>
<td>1.888</td>
<td>0.681</td>
<td>1.000</td>
<td>4.500</td>
</tr>
<tr>
<td>Sexual self efficacy</td>
<td>2.880</td>
<td>3.000</td>
<td>3.000</td>
<td>0.681</td>
<td>1.000</td>
<td>4.330</td>
</tr>
<tr>
<td>Sexual intentions that are risky</td>
<td>1.817</td>
<td>2.000</td>
<td>2.370</td>
<td>0.212</td>
<td>1.000</td>
<td>3.750</td>
</tr>
<tr>
<td>Sexual behaviors that are risky</td>
<td>8.175</td>
<td>7.000</td>
<td>6.000</td>
<td>0.596</td>
<td>0.000</td>
<td>13.000</td>
</tr>
</tbody>
</table>

### Table 9b

*Descriptive Statistics for Predictor and Predicted Indices in the Risky Sexual Behavior Model, Subsample Females (n=351)*

<table>
<thead>
<tr>
<th>Indices</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>Std. Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impulsive decision making</td>
<td>2.216</td>
<td>2.303</td>
<td>2.330</td>
<td>0.469</td>
<td>1.000</td>
<td>4.000</td>
</tr>
<tr>
<td>Sensation seeking</td>
<td>2.976</td>
<td>3.000</td>
<td>3.000</td>
<td>0.809</td>
<td>1.000</td>
<td>5.000</td>
</tr>
<tr>
<td>Mass media exposure</td>
<td>3.880</td>
<td>3.875</td>
<td>4.380</td>
<td>0.598</td>
<td>1.920</td>
<td>5.000</td>
</tr>
<tr>
<td>Perceptions that media messages encourage sexual behavior</td>
<td>2.595</td>
<td>2.750</td>
<td>3.000</td>
<td>0.217</td>
<td>1.000</td>
<td>5.000</td>
</tr>
<tr>
<td>Permissive attitudes regarding sex</td>
<td>1.920</td>
<td>1.800</td>
<td>1.560</td>
<td>0.830</td>
<td>1.000</td>
<td>5.000</td>
</tr>
<tr>
<td>Perceptions of peer norms that are risky</td>
<td>1.681</td>
<td>1.600</td>
<td>1.438</td>
<td>0.556</td>
<td>1.000</td>
<td>4.500</td>
</tr>
<tr>
<td>Sexual self efficacy</td>
<td>2.770</td>
<td>2.667</td>
<td>2.330</td>
<td>0.590</td>
<td>1.000</td>
<td>4.330</td>
</tr>
<tr>
<td>Sexual intentions that are risky</td>
<td>1.677</td>
<td>1.750</td>
<td>1.750</td>
<td>0.321</td>
<td>1.000</td>
<td>3.750</td>
</tr>
<tr>
<td>Sexual behaviors that are risky</td>
<td>7.302</td>
<td>6.000</td>
<td>5.000</td>
<td>0.530</td>
<td>0.000</td>
<td>13.000</td>
</tr>
</tbody>
</table>
Table 10a and Table 10b provide the correlation coefficients between the eight indices for each subsample. Most of the correlation coefficients are similar between the male and female subsamples. However, there are two notable differences. Table 9a and 9b indicate that the correlations between perceptions that media messages encourage sexual behaviors index and the mass media exposure index are markedly different among males ($r = 0.589$) and females ($r = 0.703$) ($z = 2.620$, $p<.01$). The correlations among males versus females are also different concerning sexual intentions that are risky and sexual behaviors that are risky ($r_{\text{males}} = 0.363$; $r_{\text{females}} = 0.670$). The two correlations are statistically different ($z = 5.720$, $p < .001$).

In both instances the correlations are significantly stronger among females.
Table 10a

Pearson’s Correlation Coefficients for Predictor and Predicted Indices in the Risky Sexual Behavior Model, Subsample Males (n= 361)

<table>
<thead>
<tr>
<th>Indices</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Impulsive decision making</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Sensation seeking</td>
<td>0.352*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Mass media exposure</td>
<td>0.016</td>
<td>0.321*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Perceptions that media messages encourage sexual behaviors</td>
<td>0.013</td>
<td>0.003</td>
<td>0.589*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Permissive attitudes towards sex</td>
<td>0.176*</td>
<td>0.021</td>
<td>0.113*</td>
<td>0.418*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Perceptions of peer norms that are risky</td>
<td>0.352*</td>
<td>0.301*</td>
<td>0.088</td>
<td>0.183*</td>
<td>0.609*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Sexual self efficacy</td>
<td>-0.022</td>
<td>-0.005</td>
<td>-0.076</td>
<td>-0.232*</td>
<td>-0.120*</td>
<td>-0.102*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Sexual intentions that are risky</td>
<td>0.016</td>
<td>0.065</td>
<td>0.071</td>
<td>0.111*</td>
<td>0.511*</td>
<td>0.415*</td>
<td>-0.121*</td>
<td></td>
</tr>
<tr>
<td>9. Sexual behaviors that are risky</td>
<td>0.100</td>
<td>0.022</td>
<td>0.077</td>
<td>0.127*</td>
<td>0.313*</td>
<td>0.420*</td>
<td>-0.017</td>
<td>0.363*</td>
</tr>
</tbody>
</table>

Note. * p ≤ 0.05

Table 10b

Pearson’s Correlation Coefficients for Predictor and Predicted Indices in the Risky Sexual Behavior Model, Subsample Females (n= 351)

<table>
<thead>
<tr>
<th>Indices</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Impulsive decision making</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Sensation seeking</td>
<td>0.295*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Mass media exposure</td>
<td>0.026</td>
<td>0.386*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Perceptions that media messages encourage sexual behaviors</td>
<td>0.046</td>
<td>0.006</td>
<td>0.703*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Permissive attitudes towards sex</td>
<td>0.385*</td>
<td>0.065</td>
<td>0.127*</td>
<td>0.494*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Perceptions of peer norms that are risky</td>
<td>0.290*</td>
<td>0.310*</td>
<td>0.007</td>
<td>0.188*</td>
<td>0.675*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Sexual self efficacy</td>
<td>-0.028</td>
<td>-0.003</td>
<td>-0.032</td>
<td>-0.142*</td>
<td>-0.123*</td>
<td>-0.134*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Sexual intentions that are risky</td>
<td>0.016</td>
<td>0.065</td>
<td>0.070</td>
<td>0.113*</td>
<td>0.502*</td>
<td>0.438*</td>
<td>-0.236*</td>
<td></td>
</tr>
<tr>
<td>9. Sexual behaviors that are risky</td>
<td>0.014</td>
<td>0.020</td>
<td>0.198*</td>
<td>0.202*</td>
<td>0.400*</td>
<td>0.416*</td>
<td>-0.199*</td>
<td>0.670*</td>
</tr>
</tbody>
</table>

Note. * p ≤ 0.05
Fit Indices between the Gender Subsamples

A group comparison is conducted next to assess the extent to which the same or different models should be used to represent males and females. The model fit indices are reported in Table 11. The fit indices for the unconstrained model and the fully constrained model are relatively similar. The criteria, once again, indicate a good fit with the final revised model and the Satorra Bentler model difference test is significant. Therefore, there is no overall difference between the model fit for males versus females.

Table 11
Goodness of Fit Indices for Revised Risky Sexual Behavior Model Comparing Subsamples, Males (n) = 361 vs. Females (n) = 351

<table>
<thead>
<tr>
<th>Model</th>
<th>X², df, p</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unconstrained model</td>
<td>83.475, df= 28, p= 0.200</td>
<td>0.954</td>
<td>0.980</td>
<td>0.045</td>
<td>0.024</td>
</tr>
<tr>
<td>Fully constrained model</td>
<td>81.209, df= 31, p= 0.650</td>
<td>0.992</td>
<td>0.984</td>
<td>0.038</td>
<td>0.049</td>
</tr>
</tbody>
</table>

*Note.* Satorra Bentler Chi-square difference test reflects the difference between models for males and females. In the unconstrained model, all paths between males and females were allowed to vary. In the fully constrained model, model paths between males and females were restricted to be equal.
Table 12 presents the standardized (β) coefficients for the gender subsamples. While most β coefficients are remarkably similar, there were a few notable exceptions. Specifically, mass media exposure is a much stronger predictor of perceptions that media messages encourage sexual behaviors among females (β = 0.703) than males (β = 0.589). Likewise, sexual intentions that are risky is a much stronger predictor of sexual behaviors that are risky among females (β = 0.670) than among males (β = 0.363). Sexual intentions that are risky explained almost 45 percent of the variance in sexual behaviors that are risky among females. The intention variable accounted for only 13.2 percent of the variance in sexual behaviors that are risky among males.
Table 12

*Standardized (β) Path Analysis Coefficients and (Standard Errors) for the Risky Sexual Behavior Model, Subsample Males (n=361) vs. Females (n=351)*

<table>
<thead>
<tr>
<th>Predictor indices</th>
<th>Impulsive decision making</th>
<th>Sensation seeking</th>
<th>Mass media exposure</th>
<th>Perceptions that media messages encourage sexual behaviors</th>
<th>Permissive attitudes regarding sex</th>
<th>Perceptions of peer norms that are risky</th>
<th>Sexual self efficacy</th>
<th>Sexual intentions that are risky</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass media exposure</td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td>0.321 / 0.386</td>
</tr>
<tr>
<td>Perceptions that media messages encourage sexual behaviors</td>
<td>0.689 / 0.703</td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td>0.346 / 0.494</td>
<td></td>
</tr>
<tr>
<td>Permissive attitudes regarding sex</td>
<td>0.188 / 0.296</td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td>0.076 / 0.098</td>
<td></td>
</tr>
<tr>
<td>Perceptions of peer norms that are risky</td>
<td>0.287 / 0.289</td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td>0.119</td>
<td></td>
</tr>
<tr>
<td>Sexual self efficacy</td>
<td>-0.122 / -0.232</td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
<td>0.015 / 0.054</td>
<td></td>
</tr>
<tr>
<td>Sexual intentions that are risky</td>
<td>0.298 / 0.178 / -0.138 / 0.078</td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
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<td>0.163</td>
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<tr>
<td>Sexual behaviors that are risky</td>
<td>0.369 / 0.384 / -0.275</td>
<td><strong>Male / Female</strong></td>
<td><strong>Male / Female</strong></td>
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<td><strong>Male / Female</strong></td>
<td>0.132 / 0.449</td>
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*Note: All standardized coefficients are significant at p < 0.05*
CHAPTER 5
DISCUSSION

Overview of the Study

Although a number of studies have demonstrated the effects of mass media on various behaviors (Escobar-Chavez et.al, 2005) the systematic process of examining media related risk factors in health behavior models is still in its infancy. Researchers know very little about how exposure to the ubiquitous sexual images in mass media affects adolescents (Brown & L’Engle, 2009). Most studies conducted to date on the impact of mass media have focused on the influence of television exposure. Research finding have indicated that adolescents who view more television tend to overestimate the occurrence of sexual behaviors in their social surroundings (Bryant & Rockwell, 1994) and tend to have more permissive attitudes towards premarital sex (Greenson & William, 1986). In addition, empirical studies examining the multiple risk factors of adolescent sexual behaviors (c.f., Buhi & Goodson, 2007; Zimmerman, 2007) have typically not include potential media-related risk factors when predicting unhealthy sexual behaviors.

Using an approach that parallels various establish health-related theories and models, this study examines the utility of mass media-related risk factors as well as traditional risk factors in predicting sexual intentions and sexual behaviors that are risky. In particular, this study meets its first objective by offering a rationale, and several propositions and hypotheses for a more inclusive model integrating two mass media-related variables with five traditional health risks factors that appear in the current literature. The integrated model details the role of mass media exposure and perceptions of media messages in relation to traditional risk factors when
predicting adolescents’ intentions to engage in risky sexual behaviors, and their actual sexual behaviors that are risky.

The second objective of the study was to test the proposed integrated model using a secondary analysis via structural equation statistical methods applied to the Teen Media and Health Survey data. The SEM analyses indicated that with relatively minor revisions, the final revised model provided a good fit to the data. After removing two paths, the test of the final model supported relationships that were hypothesized based on a rationale linking several mass communication and health-related behavior theories. This suggests that the proposed model can help provide explanation of sexually risky behaviors among adolescents in the United States.

Consistent with previous theoretical literatures (Sheeran et.al, 1999; Zimmerman et.al, 2007) the findings from this study suggest that sexual intentions that are risky are strong predictor of self-reported sexual behaviors that are risky. In addition, in accordance with the TPB model,permissive attitudes regarding sex, perceptions of peer norms that are risky, and sexual self efficacy also predict sexual intentions that are risky. This study’s rationale and model further support the utility of impulsive decision making and sensation seeking when predicting sexual risks. Finally, while replicating previous research findings, this study offers an extension to the literature by further detailing the risk-related roles of mass media exposure and perceptions of popular media messages.

This study contributes to the goal of theory building by integrating the rationales behind various communication and health-related theories. The integrated rationales support a theoretic model proposing risk factors that are sufficient to predict unhealthy sexual behaviors among adolescents. The current model and study results go beyond using the traditional risk factors in health behavior models and indicate that overall exposure to mass media is a significant
antecedent of adolescents’ perceptions that media messages encourage sexual behaviors. Perceptions that media messages encourage sexual behaviors are then successfully used to predict adolescent’s permissive attitudes regarding sex, their perceptions of peer norms that are risky, and the adolescents’ perceptions of sexual self efficacy. The perceptions that media messages encourage sexual behaviors construct is a relatively new addition. It has notable importance, along with impulsive decision making and sensation seeking, as a theoretical and empirical antecedent of risk-related attitudes, norms and perceptions of self efficacy.

The overall model was also tested in separate male/female models to examine the potential generality of the model across gender subgroups. More similarities than differences, were found when comparing the model among males versus females. The overall model were statistically indistinguishable. This helps support the generalizability of the model. One notable gender difference was the path from mass media exposure to perceptions that media messages encourage sexual behaviors. This path was appreciably stronger among females than among males. Another notable difference was that the pathway from sexual intentions that are risky to sexual behaviors that are risky. This path was again stronger among females than among males.

An important result to note is the direct impact of sensation seeking on mass media exposure. Previous research by Rowland, Fouts & Heatherton (1989) found that sensation seeking to be negatively related to overall TV viewing hours. In direct contrast, this study found sensation seeking to be a positive and direct predictor of mass media exposure. It is possible that the discrepancy between the current findings and Rowland et.al’s (1989) findings were due to different samples. The previous researchers used college student samples, while the current study used middle and high school samples (ages 11-18). It may be that older adolescents who are high sensation seekers have the ability to seek out other activities while younger adolescents who are
high sensation seekers may live vicariously through the ‘risky’ experiences of models portrayed in mass media.

**Implications for Interventions**

The final objective of this study is to help provide insights into applied interventions and potential future theory-based research addressing adolescents’ sexual risks. Similar to what TRA/TPB reviews have suggested (c.f., Albarracin et al, 2001), interventions based on this model should strive to modify adolescent’s attitudes regarding sex, their perceptions of sexual peer norms and their perceptions of sexual self efficacy. Likewise, similar to the MDM model, this study suggests that particular subgroups of adolescents who are high impulsive decision makers and high sensation seekers may need specifically targeted risk-reduction messages, particularly in relation to permissive attitudes regarding sex and perceptions of peer norms that are risky. This model goes a step further, however, in suggesting additional factors to be considered in interventions. For instance, media exposure and perceptions of sexuality through media play an important role in adolescents’ attitudes, norms and perceptions of self efficacy. Parents, educators, health practitioners should discuss with adolescents the content of popular mass media, along with the ways that the popular media influence young audiences.

Along with peers, parents, and school health classes, media such as television, movies, and magazines have been cited by teens as major sources for sexual information (L’Engle, Brown & Kenneavy, 2006). However, adolescents most likely receive different information from mass media than from parents, teachers and religious leaders. The sexual content in the media, along with peers, may dilute the positive impact of school-based sexual health programs and more traditional sexual values espoused by parents and religious leaders. The majority of sexual content in the media depicts risk-free, recreational sexual behavior between non-married
people. Media programming rarely depicts negative consequences from sexual behavior, and
depictions of condom and contraception use are rare. Adolescent media users might be more
likely to adopt behaviors depicted by characters who are perceived as attractive and realistic, and
who are not punished but rewarded for their risky behaviors. Therefore, messages about
sexuality in the media may be especially compelling to adolescents’ attitudes, norms and self
efficacy. Parents, teachers and health practitioners need to pay particular attention to creating
messages that can combat the information that adolescent receive from mass media about sex
and sexual behaviors.

The most important implication may be that adults in U.S. society should take children’s
exposure to media seriously, pay attention to what their children are viewing and to become
active in their communities advocating for more socially responsible media. A concerted effort
can be made to reduce sexual innuendos, images and portrayals in the media.

**Limitations of the Study and Directions for Future Research**

The current study has several limitations. In particular, despite being uni-dimensional the
reliability of the outcome variables of risky sexual intention and risky sexual behaviors did not
have strong internal consistency. The reliabilities for the indices could be increased by adding
items to the indices. However, Streiner (2003) argued that in many cases, even seemingly
unidimensional constructs can have a number of different aspects and higher values may reflect
unnecessary duplication of content across items and “point more to redundancy than to
homogeneity” (p.102).

Moreover, a complete longitudinal test could not be performed due to the inability of the
Mplus program to test data from only two time periods. Path analysis in Mplus requires data to
have three or more time periods. Even though the data had two waves to take time order into

83
account, the design does not allow for full explication of the process of examining how perceptions of media messages for example, causally effect attitudes. It can be possible that adolescents who already have permissive attitudes towards sex are more likely to perceive that mass media messages encourage sexual behavior. In addition, the data for the study were gathered in 2002 and 2004 and hence need to be updated using three or more waves of data collection. A number of variables previously hypothesized to be important to adolescent sexual risky taking behaviors were not measured in the current study. Future research should include measures of parent-child communication, parental monitoring, religious and school influences (Escobar-Chaves, 2005).

An additional cause for concern and option for future research involves measurements of mass media. More and more, mass media cannot be clearly separated into distinct media sources such as television, radio and print. In recent years there has been increased integration of media and media exposure. Television and movie exposures have long been difficult to distinguish. Now television, movies, music videos, and music are readily available through the internet. Future communication and media scholars need to begin reinterpreting operationalization of mass media and considering how to better capture the phenomena of mass media usage. Alternatively, the integration of media outlets can provide health researchers, teachers and practitioners with alternative for communicating safe-sex messages.

While mass media and media messages are not the sole source of sexual socialization among adolescents, the mass media do have effects. Sometimes they are subtle and sometimes they appear to be powerful. Often the potential appears to be greater for the negative rather than the positive effects. Due to this, a continued effort should be made to learn more about the role that mass media play in sexual socialization. Future research should explore and incorporate
other variables such as interpersonal communication, pubertal status, socio-economic and demographic factors in order to better explain sexual risk taking. In addition, future studies should replicate this test of the model in order to assess the longitudinal validity of the model. Such a model test would give additional internal and external validity to the model and help glean further information regarding both the structure and generalizability of the model as applied to adolescent sexual behaviors. In particular, further research may focus on helping health workers to understand the impact of social environmental variables including mass media and mass media messages.

The recurring usage of similar predictor variables and models suggests that researchers have offered a limited viewed of health-related behaviors that represent risks. This study suggests that preventive sexual health research efforts can benefit by including mass media exposure and perceptions of media messages as risk factors. This study specifically sought to accomplish this goal by understanding the effects of the two mass media variables within the traditional theoretical models of risky sexual behaviors, thus building on prior theoretical health models. Health care providers, policy makers and researchers have shown substantial interest in fundamentally understanding why adolescents initiate early sexual intercourse and why youth engage in risky sexual behaviors (Buhi & Goodson, 2007). Understanding these fundamental motivations and the roles that popular mass media play can facilitate more effective interventions attending both to the risks and to the youth who exhibit them (Kirby, 2002).
APPENDIX A
Questionnaire Items

Impulsive decision making

Please tell us how often you do each of the following things.

When I do something I think about all of my choices very carefully.
1= Never
2= Sometimes
3= Often
4= Always

I do whatever is the most fun.
1= Never
2= Sometimes
3= Often
4= Always

When I do something I consider if it will be good or bad for my future.
1= Never
2= Sometimes
3= Often
4= Always

I do whatever feels good.
1= Never
2= Sometimes
3= Often
4= Always

Sensation Seeking

I prefer friends who are exciting and unpredictable.
1= Strongly disagree
2= Disagree
3= No opinion
4= Agree
5= Strongly agree

I like to do scary things.
I like new and exciting experiences, even if I have to break the rules.

Mass media exposure
How often do you watch TV Mondays through Fridays during the school year?
1=Never
2=Once a week or less
3=Two or three times a week
4=Almost everyday
5=At least once everyday
6=Almost all the time I’m not in school
7=Missing

How often do you watch TV on Saturdays and Sundays during the school year?
1=Never
2=Once in a while, but not every weekend
3=About one time during the weekend
4=About once on Saturday and once on Sunday
5=Several times throughout the weekend
6=Almost the whole weekend
7=Missing

How often do you watch TV throughout the week during the summer months?
1=Never
2=Once a week or less
3=Two or three times a week
4=Almost everyday
5=At least once everyday
6=Almost all the time
7=Missing

How often do you watch movies on VCR, DVD, or Pay Per View?
1=Never
2=About every other month or less
3=About once a month
4=A few times a month
5=About once a week or more

How often do you see movies in the movie theater?
1=I never go to movies
2=About every other month or less
3=About once a month
4=A few times a month
5=About once a week or more

How often do you use the Internet Mondays through Fridays during the school year?
1=Never
2=Once a week or less
3=Two or three times a week
4=Almost everyday
5=At least once everyday
6=Almost all the time I’m not in school
7=Missing

How often do you use the Internet on Saturdays and Sundays during the school year?
1=Never
2=Once in a while, but not every weekend
3=About one time during the weekend
4=About once on Saturday and once on Sunday
5=Several times throughout the weekend
6=Almost the whole weekend
7=Missing

How often do you use the Internet throughout the week during the summer months?
1=Never
2=Once a week or less
3=Two or three times a week
4=Almost everyday
5=At least once everyday
6=Almost all the time
7=Missing

How often do you listen to music Mondays through Fridays during the school year?
1=Almost never
2=Once in a while
3=Sometimes
4=Frequently
5=Almost all the time while not in school
6=Missing
How often do you listen to music Saturdays and Sundays during the school year?
   1=Almost never
   2=Once in a while
   3=Sometimes
   4=Frequently
   5=Almost the whole weekend
   6=Missing

How often do you listen to music throughout the week during the summer months when you’re not in school?
   1=Almost never
   2=Once in a while
   3=Sometimes
   4=Frequently
   5=Almost the whole summer
   6=Missing

**Perceptions that media messages encourage sexual behavior**

The messages I get from TV are that it’s OK for people my age to have sex.
   1= Strongly disagree
   2= Disagree
   3= No opinion
   4= Agree
   5= Strongly agree

The messages I get from Internet sites are that it’s OK for people my age to have sex.
   1= Strongly disagree
   2= Disagree
   3= No opinion
   4= Agree
   5= Strongly agree

The messages I get from movies are that it’s OK for people my age to have sex.
   1= Strongly disagree
   2= Disagree
   3= No opinion
   4= Agree
   5= Strongly agree

The messages I get from music artists are that it’s OK for people my age to have sex.
   1= Strongly disagree
2= Disagree
3= No opinion
4= Agree
5= Strongly agree

The messages I get from the media are that I should use condoms if I have sex.
1= Strongly disagree
2= Disagree
3= No opinion
4= Agree
5= Strongly agree

**Permissive attitudes regarding sex**

I believe it is OK for people my age to have sex on the first date.
1= Strongly disagree
2= Disagree
3= No opinion
4= Agree
5= Strongly agree

I believe it is OK for people my age to have sex with a steady boyfriend or girlfriend.
1= Strongly disagree
2= Disagree
3= No opinion
4= Agree
5= Strongly agree

I believe it is OK for people my age to have sex before marriage if they are in love.
1= Strongly disagree
2= Disagree
3= No opinion
4= Agree
5= Strongly agree

I believe people should not have sex before marriage.
1= Strongly disagree
2= Disagree
3= No opinion
4= Agree
5= Strongly agree

It doesn’t matter who you have sex with as long as you enjoy it.
   1= Strongly disagree
   2= Disagree
   3= No opinion
   4= Agree
   5= Strongly agree

It’s important to be in love with a person you have sex with.
   1= Strongly disagree
   2= Disagree
   3= No opinion
   4= Agree
   5= Strongly agree

I believe it is OK for people my age to have oral sex.
   1= Strongly disagree
   2= Disagree
   3= No opinion
   4= Agree
   5= Strongly agree

**Perceptions of sexual norms that are risky**
Regardless of whether you have had sex or not, how do you think these different people feel about each of the following things?

How would your friends feel about you having sex at this time in your life? Would they…
   1= Strongly disapprove
   2= Disapprove
   3= Have no opinion
   4= Approve
   5= Strongly approve

If you have been going out with someone for a while, it’s expected that you are having sex with that person.
   1= Strongly disagree
   2= Disagree
3= No opinion  
4= Agree  
5= Strongly agree

My friends believe I should use condoms if I have sex.  
1= Strongly disagree  
2= Disagree  
3= No opinion  
4= Agree  
5= Strongly agree

Most of my friends think it’s important to have a boyfriend or be going out with someone. (Females only)  
1= Definitely yes  
2= Probably yes  
3= No opinion  
4= Probably not  
5= Definitely not

Most of my friends think it’s important to have a girlfriend or be going out with someone. (Males only)  
1= Definitely yes  
2= Probably yes  
3= No opinion  
4= Probably not  
5= Definitely not

Most of my friends believe it’s important for people my age to remain virgins.  
1= Definitely yes  
2= Probably yes  
3= No opinion  
4= Probably not  
5= Definitely not

Most of my friends believe condoms should be used even if the two people know each other very well.  
1= Definitely yes  
2= Probably yes  
3= No opinion
Most of my friends believe it’s OK for people my age to have oral sex.

1= Definitely yes
2= Probably yes
3= No opinion
4= Probably not
5= Definitely not
Sexual self efficacy

If you had a boyfriend or a girlfriend, how sure are you that you could refuse to have sex with that person if you didn’t feel ready? (When we say “having sex”, we mean when a guy puts his penis into a girl’s vagina. This can also be called “going all the way” or “doing it.”)

1= Not at all sure
2= Not very sure
3= Somewhat sure
4= Quite sure
5= Extremely sure

If you were going to have sex, how comfortable would you be insisting that you and your partner use condoms?

1= Very comfortable
2= Comfortable
3= Uncomfortable
4= Very uncomfortable

If you were going to have sex, how comfortable would you be buying condoms in a store?

1= Very comfortable
2= Comfortable
3= Uncomfortable
4= Very uncomfortable

If you were going to have sex, how comfortable would you be putting a condom on a guy?

1= Very comfortable
2= Comfortable
3= Uncomfortable
4= Very uncomfortable
Sexual intentions that are risky

How likely is it that you will have sex in the next year?
   1= Very unlikely
   2= Somewhat unlikely
   3= Somewhat likely
   4= Very likely

How likely is it that you will have sex while you are in high school?
   1= Very unlikely
   2= Somewhat unlikely
   3= Somewhat likely
   4= Very likely

In the future, how likely is it that you will discuss AIDS and STDs with a person you were going to have sex with?
   1= Very unlikely
   2= Somewhat unlikely
   3= Somewhat likely
   4= Very likely

In the future, how likely is it that you will use condoms when you have sex?
   1= Very unlikely
   2= Somewhat unlikely
   3= Somewhat likely
   4= Very likely

Sexual behaviors that are risky
Which of the following things have you ever done with a guy/girl? Choose all that apply.

1. Had a crush on a guy/girl
2. Dated or went out with a guy/girl at least once
3. Been in a private place without any adults around with just one guy/girl that I’m attracted to
4. Kissed a guy/girl lightly on the lips
5. Kissed a guy/girl using my tongue (French kissed)
6. Had my breasts touched by a guy/Touched breasts
7. Had my vagina touched by a guy/ had penis touched by a girl
8. Had oral sex
9. Had sex using a condom
10. Had sex without a condom
11. Had sex more than once
12. Had sex with more than one person
13. Had sex with more than one person without a condom
APPENDIX B
Human Subjects Approval

Office of the Vice President For Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673 · FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 2/12/2010

To: Madhurima Sarkar

Dept.: COMMUNICATION

From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research
Predicting adolescent sexual risk behaviors using a theoretical biopsychosocial model

The application that you submitted to this office in regard to the use of human subjects in the research proposal referenced above has been reviewed by the Human Subjects Committee at its meeting on 02/10/2010. Your project was approved by the Committee.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by 2/9/2011 you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by
the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the Chair of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB00000446.

Cc: Gary Heald, Advisor
HSC No. 2010.3834


http://host.madison.com/ct/news/local/health_med_fit/article_96d0ee57-e3dc-59d7-a5ec-e5cbe5b71ffc.html


Strasburger, V.C. (1997). “Sex, drugs, rock’n’roll” and the media- are the media responsible for adolescent behavior? *Adolescent Medicine, 8*(3), 403-414.


BIOGRAPHICAL SKETCH

Madhurima Sarkar graduated with a Bachelor’s in Economics from Cornell University. She received her Masters Degree in Integrated Marketing Communication from Florida State University in Summer 2007 and her PhD. in Communication Theory and Research from Florida State University in Spring 2011.

During her graduate work, she taught undergraduate students in the areas of public speaking, research methods, media techniques and new communication technologies. Her research interests focuses on adolescent health, with a special emphasis on risk behaviors and risk prevention.