6-3-2014

Hot And Bothered: The Role Of Arousal And Rejection Sensitivity In Dual Process Sexual Decision Making For Gay And Bisexual Men

H Jonathon Rendina

Graduate Center, City University of New York

How does access to this work benefit you? Let us know!

Follow this and additional works at: http://academicworks.cuny.edu/gc_etds

Part of the Public Health Education and Promotion Commons, Quantitative Psychology Commons, and the Social Psychology Commons

Recommended Citation


This Dissertation is brought to you by CUNY Academic Works. It has been accepted for inclusion in All Dissertations, Theses, and Capstone Projects (2014-Present) by an authorized administrator of CUNY Academic Works. For more information, please contact deposit@gc.cuny.edu.
HOT AND BOTHERED: THE ROLE OF AROUSAL AND REJECTION SENSITIVITY IN DUAL PROCESS SEXUAL DECISION MAKING FOR GAY AND BISEXUAL MEN

by

H. JONATHON RENDINA

A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

2014
This manuscript has been read and accepted for the Graduate Faculty in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

Sarit A. Golub, PhD MPH

Co-Chair of Examining Committee

Jeffrey T. Parsons, PhD

Co-Chair of Examining Committee

Maureen O’Connor, PhD

Executive Officer

<table>
<thead>
<tr>
<th>Examing Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarit A. Golub, PhD MPH</td>
</tr>
<tr>
<td>Jeffrey T. Parsons, PhD</td>
</tr>
<tr>
<td>Kristin Sommer, PhD</td>
</tr>
<tr>
<td>John E. Pachankis, PhD</td>
</tr>
<tr>
<td>Brian Mustanski, PhD</td>
</tr>
</tbody>
</table>

THE CITY UNIVERSITY OF NEW YORK
Abstract

HOT AND BOTHERED: THE ROLE OF AROUSAL AND REJECTION SENSITIVITY IN DUAL PROCESS SEXUAL DECISION MAKING FOR GAY AND BISEXUAL MEN

by

H. Jonathon Rendina

Advisors: Professors Sarit A. Golub and Jeffrey T. Parsons

Dual process theories of decision making acknowledge the functioning of two distinct yet simultaneous processes termed System 1 and System 2. While System 1 relies more heavily on automatic and affective processing, System 2 relies more heavily on effortful and cognitive processing. Over the past several decades, many lines of research have shown the importance of System 1 in decision making and several prominent social psychological theories of interpersonal behavior, such as rejection sensitivity, rely on this dual distinction between affective and cognitive processing. Despite the prominence of dual process theories in many areas of psychology, the role of System 1 has been largely absent from psychological inquiries into sexual decision making. As such, the aims of this dissertation were to: (1) investigate a dual process model of sexual decision making by incorporating the role of anxious and sexual arousal into a model with known System 2 predictors of sexual behavior; and (2) examine whether rejection sensitivity as a dispositional trait can be applied to condom use as a behavior and whether it acts upon condom use via interactions within the dual process framework investigated within the first aim.

To achieve these aims, data were collected as part of a larger, longitudinal study of highly sexually active gay and bisexual men in New York City. As part of the project, men completed a one-hour survey from home (i.e., computer-assisted survey interviewing or CASI) as part of their
12-month longitudinal follow-up appointment and subsequently completed a 30-day online daily diary of their affect and sexual behavior. Using multilevel modeling, I tested a series of hypotheses regarding the role of anxious arousal (within-person), sexual arousal (within-person), perceived behavioral control (within-person), safer sex self-efficacy (between-person), and condom-related rejection sensitivity (between-person) on daily engagement in unprotected anal intercourse with casual male partners.

Across models, results supported several of the hypotheses from the first aim. Although anxious arousal was not found to be associated with engagement in UAI, sexual arousal was significantly positively associated with UAI, as hypothesized. Similarly, perceived behavioral control and safer sex self-efficacy were both shown to be negatively associated with engaging in UAI. Results did not support the hypothesis that System 1 (i.e., sexual arousal) and System 2 (i.e., behavioral control) processing interact in their influence on UAI, but rather that System 1 biases System 2 processing as demonstrated through a mediational analysis. Building upon these analyses, several of the hypotheses from the second aim were also confirmed. Condom-related rejection sensitivity was found to be significantly and positively associated with engaging in UAI as well as with higher levels of anxious arousal on a given day. Examining potential mechanisms of the association between rejection sensitivity and UAI, results revealed significant interactions between rejection sensitivity and self-efficacy as well as rejection sensitivity and sexual arousal. Taken together, findings suggest that rejection sensitivity may ameliorate the protective effect of self-efficacy on UAI and heighten the risk for UAI influenced by sexual arousal. The theoretical and public health implications of the findings and directions for future research are discussed.
Acknowledgements

I am incredibly fortunate to have received the support and encouragement of so many people, without whom I would have never reached the point of writing and completing this dissertation. First and foremost, I have to thank my parents, Barbara and Hugh Rendina, who have always been my largest source of love and support. Both my mom and my dad have sacrificed so much to allow me to achieve my dreams, and for this I will be forever grateful. I could not have asked for better parents or role models than the two of you. I also have to thank the rest of my family, including my brother, Matthew, my only living grandparent, Barbara, and my amazingly fun and close aunts, uncles, and cousins; I cannot forgot to thank those important family members who are no longer around to celebrate this accomplishment with me—my grandmother, Lucy, grandfather, Hugh, grandfather, Joseph, and uncle, Phillip, who live on in my memories.

I am also incredibly grateful to have many friends who have been like a second family after my move to New York. To my much loved group of former/current co-workers and great friends, Aaron, who reminds me to stay true to what I believe, Corina, who inspires me to be a better person, Margaret, who is a constant source of laughter without even trying, and Ruben, who has been so much more than just a great officemate for the past four years—you have all made these years of work feel like so much fun. Similarly, to my many friends who help me to leave the work behind when I need to and experience all that New York has to offer, especially James, who reminds me how to have patience, Matt, who gives my work a sense of purpose, Hannah, who takes care of us all, and Thomas, who never lets me forget the importance of laughter—you have all made New York City living everything I had hoped it would be. I have to give an extra special thanks to Kristi—she has been a friend, a colleague, and a companion
throughout this journey. We have shared milestones, hotel rooms, dances, wine, laughs, anxieties, and advice. Despite starting a year after me, she has been the best cohort-mate I could have ever asked for, and I cannot imagine having done this without her.

I was lucky to find my way to CHEST, where I met many wonderful former and current colleagues who have inspired my work and helped to make this research study possible. I am forever grateful to Ana, who has been a generous friend in addition to supervisor and collaborator, Brooke, who grew to feel like my work sister, and Christian, who I have always admired working with despite my often less-than-sentimental ways of showing it—you have each been amazing examples for me to follow. I also have to thank the entire team of current and former interns, recruiters, research assistants, project staff, and administrators. I also would like to give a special thanks to our former Associate Director, Michael Adams, who kept me in line during my first years in New York.

I never would have made it to The Graduate Center, CHEST, or to any of the amazing people mentioned in these Acknowledgements without the wonderful guidance of my undergraduate mentor, Dr. Anthony D’Augelli—you were the guiding force behind many of the early decisions that led me to become the researcher I am today, and I could not be more glad I was sitting in HDFS 250 the day you and Kat mentioned that you were in need of an undergraduate research assistant.

The wonderful training I have received would not have been the same without the support of my funding agency, the National Institute of Mental Health, who generously provided the funding for my predoctoral fellowship (F31-MH095622) as well as for the larger research study (R01-MH087714; PI: Parsons).
Finally, none of this would have been possible without my incredibly talented committee—Drs. Sarit Golub, Jeffrey Parsons, Kristin Sommer, John Pachankis, and Brian Mustanski. You have each brought unique and crucial sources of expertise to this project and it has undoubtedly benefited from your contributions and guidance as well as the incredibly important work each of you has done that helped me to ask and answer the questions herein. I have to especially thank my co-chairs, Sarit and Jeff. Sarit, since the first time we met on interview day I have continually been impressed by your amazing intellect and passion. Jeff, you have provided me more opportunities and opened more doors for me than I can count, and I could not be happier to have the opportunity to continue my work at CHEST. Nobody could ask for a better combination of role models and mentors than I had, and I look forward to many more occasions for collaboration in the future.
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Dual Processes in Decision Making</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>Research on Sexual Decision Making</td>
<td>28</td>
</tr>
<tr>
<td>4</td>
<td>Individual and Within-Person Differences in Decision Making</td>
<td>43</td>
</tr>
<tr>
<td>5</td>
<td>Overview of the Proposed Research</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>Method</td>
<td>59</td>
</tr>
<tr>
<td>7</td>
<td>Descriptive Statistics and Psychometrics</td>
<td>72</td>
</tr>
<tr>
<td>8</td>
<td>Results of the First Aim</td>
<td>78</td>
</tr>
<tr>
<td>9</td>
<td>Results of the Second Aim</td>
<td>83</td>
</tr>
<tr>
<td>10</td>
<td>Discussion</td>
<td>89</td>
</tr>
<tr>
<td>Appendix</td>
<td>Condom-Related Rejection Sensitivity Scale</td>
<td>109</td>
</tr>
<tr>
<td>Tables</td>
<td>1 through 9</td>
<td>112</td>
</tr>
<tr>
<td>Figures</td>
<td>1 through 13</td>
<td>121</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td>134</td>
</tr>
</tbody>
</table>
List of Tables

Table 1. *Demographic Characteristics of the Study Sample* ........................................... 112

Table 2. *Results of the Confirmatory Factor Analysis of the Condom-Related Rejection Sensitivity Scale* .............................................................................................................. 113

Table 3. *Results of the Multilevel Models with Anxious Arousal and Sexual Arousal Predicting UAI.* ........................................................................................................................................ 114

Table 4. *Results of the Multilevel Model with Perceived Behavioral Control and Self-Efficacy Predicting UAI* ........................................................................................................................................ 115

Table 5. *Results of the Multilevel Model with an Interaction Between Sexual Arousal and Perceived Behavioral Control in Predicting UAI* ......................................................... 116

Table 6. *Results of the Multilevel Model with Condom-Related Rejection Sensitivity Predicting UAI* ........................................................................................................................................ 117

Table 7. *Results of the Multilevel Model with Condom-Related Rejection Sensitivity, Engagement in Anal Sex, and their Interaction Predicting Anxious Arousal* ................................. 118

Table 8. *Results of the Multilevel Model with an Interaction Between Condom-Related Rejection Sensitivity and Safer Sex Self-Efficacy Predicting UAI* ............................................................ 119

Table 9. *Results of the Multilevel Models with Anxious/Sexual Arousal, Condom-Related Rejection Sensitivity, and their Interaction Predicting UAI* ............................................................ 120
List of Figures

Figure 1. Hypotheses 1a and 1b predict that within-person anxious and sexual arousal (System 1 processes) will each have positive main effects on UAI. ......................................................... 121

Figure 2. Hypotheses 2a, 2b, and 2c predict that the main effects of behavioral control (at both levels) and self-efficacy (System 2 processes) will have negative main effects on UAI. ......................................................................................................................................... 122

Figure 3. Hypothesis 3 proposes that within-person sexual arousal (System 1) moderates the association between within-person perceived behavioral control (System 2) and behavior (UAI) and diminishes the overall negative impact of perceived behavioral control on UAI. ................................................................................................................................................................. 123

Figure 4. Hypotheses 5a and 5b suggest that rejection sensitivity leads to higher levels of anxious arousal on a given day. Further, anxiety is higher on sex days than non-sex days, and rejection sensitivity moderates this association such that individuals with higher rejection sensitivity have a stronger association between sex and anxiety.................... 124

Figure 5. Hypothesis 6 proposes that rejection sensitivity will moderate the association between self-efficacy and UAI, such that the protective effect of self-efficacy on UAI will be diminished for individuals with high levels of rejection sensitivity. ....................... 125

Figure 6. Hypotheses 7a and 7b suggest that individuals high in rejection sensitivity will have a higher positive association between anxious and sexual arousal and UAI................. 126

Figure 7. The flowchart above specifies the composition of the sample used in this dissertation as they exist within the larger parent project. ................................................................. 127

Figure 8. The histogram above shows the number of diary entries completed by participants out of their 30-day cycles................................................................. 128
Figure 9. The figure above displays the original structure of the multilevel factor analysis of anxious and sexual arousal. ................................................................. 129

Figure 10. The figure above displays the final structure of the multilevel factor analysis of anxious and sexual arousal. ................................................................. 130

Figure 11. The figure above displays the interaction between condom-related rejection sensitivity and anal sex with a casual partner in their impact on daily levels of anxious arousal. ................................................................. 131

Figure 12. The above figure displays the interaction between condom-related rejection sensitivity and safer sex self-efficacy in their impact on the probability of engaging in UAI on a given day. ................................................................. 132

Figure 13. The above figure displays the interaction between condom-related rejection sensitivity and daily fluctuations in sexual arousal in their influence on the probability of engaging in UAI on a given day. ................................................................. 133
Chapter 1: Introduction

People are faced with decisions on an almost constant basis, from the easiest “no
brainers” to those which can be life-altering and may rely on a variety of strategies to arrive at a
final choice. Decision making is a mental process in which people who are faced with two or
more options arrive at a choice of which to pursue (VandenBos, 2007). Not surprisingly, given
the frequency with which people are confronted with choices to make, much of the work
underlying decision making occurs without conscious awareness or effort. The notions of
“listening to your heart,” “passion versus reason,” and “feeling torn” between the heart and the
mind are all common images in popular culture. These dualistic notions were also prominent in
many early philosophical theories regarding the role of feelings and thinking in explaining
human behavior. Beliefs regarding the role of impulse and feelings versus rational control and
logical thought in human behavior have predominated popular images of decision making across
many historical and current societies. Despite commonplace and early philosophical notions of
feelings having strong influence over behavior, psychological theories of decision making have
not, until recently, taken feelings into account.

Though the early psychological work done by Freud (1901, 1920) and other
psychoanalysts acknowledged the role of affect and unconscious processes, much of the
psychological work done in the 20th century ignored such modes of thinking. The behaviorist
movement could be said to have intentionally ignored decision making altogether, focusing
instead on how reinforcements led to learned associations which caused behaviors (e.g., Skinner,
1953). Later researchers in cognitive psychology sought to give agency back to the individual
decision-maker and focused on the role of thoughts in leading to behaviors (c.f., Miller, 2003),
though this work continued to ignore the influence of feelings and implicit or nonconscious
processes on behavior. Despite an overwhelming lack of research on affective and unconscious processes in decision making until recently, the pioneering work of Zajonc (1980b, 1984) gave credence to the notion that affective processing can occur without intervening cognitive influence and set the stage for what would later become theories of the mind.

More than three decades after the work of Zajonc, it is now well accepted by many psychologists as well as neuroscientists that mental tasks such as problem-solving, learning, attitude formation, social cognition, and decision making are guided by two simultaneous processes within the brain. These modes of processing can be distinguished in several ways, including being automatic versus controlled, intuitive versus reasoned, affective versus cognitive, and ‘hot’ versus ‘cool’ (Barrouillet, 2011b; Brainerd & Reyna, 2002; Chaiken & Trope, 1999; Epstein, Pacini, Denes-Raj, & Heier, 1996; Evans, 2011; Kahneman & Frederick, 2002; Metcalfe & Mischel, 1999; Mischel & Shoda, 1995; Reyna & Brainerd, 2011; Stanovich & West, 2000; Stanovich, West, & Toplak, 2011; Tversky & Kahneman, 1983; Zajonc, 1980a, 1980b). Theories that investigate and describe the operation of these two modes of thought are often called dual process theories. Dual process theories are used to investigate many mental phenomena, including memory (e.g., Barrett, Tugade, & Engle, 2004), learning (e.g., Evans, 2011; Sun, Slusarz, & Terry, 2005), and reasoning (e.g., Evans, 2011), and each focuses on certain distinctions between the two systems. The exact description of each of the two processes differs, but Stanovich (1999) synthesized the literature by identifying commonalities across their usage and subsequently labeled them System 1 and System 2.

Within the literature on dual process decision making, Systems 1 and 2 are distinguished by having opposite or qualitatively distinct elements of perception, processing, and purpose (Evans, 2011; Stanovich, 1999). System 1 is evolutionarily older and common to many animals;
it operates quickly and efficiently, occurs implicitly (or unconsciously), is qualitative in nature, relies heavily on feelings, affect, experience, and heuristics, and has stereotypically been considered a “lower”-order process. System 2 is evolutionarily recent and generally considered unique to human thought; it operates more slowly and requires effort, occurs explicitly (or consciously), is quantitative in nature, relies heavily on mathematical processing, logic, reason, and rationality, and has typically been considered a “higher”-order process (Barrouillet, 2011a; Frankish, 2010; Sloman, 1996; Slovic, Finucane, Peters, & MacGregor, 2004). Though the exact distinctions made between the two systems depends upon a variety of factors (e.g., the type of processing being investigated, the specific researcher’s theoretical orientation, the research question being asked), some distinctions are more common than others.

One of the primary distinctions made regarding Systems 1 and 2 in dual process theories of decision making has to do with the extent to which they operate based on affect and intuition versus cognition and reasoning. The type of processing that occurs within System 1 has been deemed “hot” by some as a result of the role of affect and emotions in biasing its outcomes, and thus the processing within System 2 is sometimes called “cool” (Abelson, 1963; Janis & Mann, 1977; Lepper, 1994; Metcalfe & Mischel, 1999; Redlawsk, 2002). While this “hot/cool” dichotomy is often used to describe distinctions between affective and cognitive processing, some researchers use it to distinguish between two types of cognition (i.e., System 2 processes) —one that is influenced by affect and one that is not (i.e., “hot” and “cold” cognition). Similarly, some researchers consider the processing that occurs in both Systems 1 and 2 to be cognitive, with the two systems employing qualitatively distinct types of cognition. Despite these inconsistencies in the distinctions drawn between “hot” and “cool” processes or Systems 1 and 2, it is common to assume that System 1 relies directly on affect while System 2, to the extent it
utilizes affect, does so only indirectly through its interaction with System 1 (Barrouillet, 2011b; Epstein, 1994). Ongoing debates regarding the exact nature of each system notwithstanding (e.g., Samuels, 2009), the purpose of the present study is to apply these existing paradigms to a new area of inquiry rather than explore or validate the distinctions among cognitions and affect or between hot and cool processes. As such, the primary distinction I will make between the two systems is that of hot or feelings-based (i.e., System 1) versus cool or thinking/planning-based (i.e., System 2) processing.

Dual process models offer unique perspectives on the role that these two systems and thus, thoughts and feelings, play in decision making. Dual process models provide predictions about the conditions under which decisions are likely to coincide with long-term, cost-benefit based thinking versus more short-term or seemingly “irrational” thinking. Under typical conditions, Systems 1 and 2 work together—affectively tagged memories may help to speed up the process through which a person can determine whether a given option would lead to a beneficial or harmful outcome (Slovic, Finucane, Peters, & MacGregor, 2007). The brain is in a constant feedback loop with the body and, as such, bodily states can lead to affective cues that similarly hasten the rate at which people are able to arrive at beneficial decisions (Damasio, 1994, 2001). However, under times of risk, uncertainty, or conflict, the two processes can conflict by causing a shift in focus from long-term goals to attending to immediate threats and interests. In these situations, System 1 processing—being more rapid, evolutionarily older, and feelings-based—often dominates decision making and operates based on instinctive processes such as threat-avoidance or pleasure-seeking. The dominance of System 1 processing during times of risk and conflict tends to lead to different and sometimes opposite decisions than would have resulted from a more “cool-headed,” planned, and reason-based approach to decision
making (Loewenstein, Weber, Hsee, & Welch, 2001; Slovic et al., 2004). For example, in the
delay of gratification paradigm, Metcalfe and Mischel (1999) found that proximal and vivid
temptations lead individuals to seek immediate gratification even when delay of gratification
would have eventually led to receiving more of the tempting outcome. As such, dual process
theories have been used empirically to understand how and why individuals may make decisions
that seem to go against their best long-term interests in favor of options with short-term benefits
but long-term consequences.

Theories of decision making that focus on the reasons behind decisions that are
advantageous in the short-term but potentially risky in the long-term may be particularly
applicable to sexual behavior, in which short-term pursuits (e.g., pleasure, intimacy) are often
pursued despite potential for long-term consequences (e.g., susceptibility to infection and
pregnancy). Despite the widespread use of dual process models within several prominent
domains of decision making research, the literature on sexual behavior has yet to adopt a dual
process model for sexual decision making. Such a model may be particularly appropriate for sex,
given that sex is likely to be tied to affect, involves the body, and may be viewed as risky for
many individuals. Moreover, the sexual decisions people make are often viewed as “irrational”
in the empirical literature due to the fact that people regularly engage in behavior with negative
consequences such as unintended pregnancy and disease transmission. Given the uncertain
personal, interpersonal, and physical risk that accompanies sexual decisions, the role that affect
may play in guiding these decisions, the influence of bodily states during sex, and the need to
better understand how seemingly “irrational” behaviors may actually result from common forms
of decision making, dual process models may be aptly applied to the understanding of these
decisional processes and their relation to behavioral outcomes. As a result of these features of
sexual behavior, dual process models are likely to be relevant for sexual decision making across a variety of different sexual decisions and behaviors.

The task of sexual decision making could be viewed and studied in many ways—as the process of deciding between alternatives in sexual initiation (i.e., engaging or not engaging), sexual partnering (i.e., choosing among partners), or sexual risk-taking (i.e., level of sexual safety to utilize). Each of these decisions is likely to be consequential to the individual making them and may involve the criteria outlined above—being affect-laden, high in perceived risk, involving bodily processes such as arousal, and having outcomes that may be viewed as “irrational” in a typical cost-benefit analysis. Though choices regarding sexual initiation and partnering may be precursors to sexual risk behavior, the actual behaviors that occur during sex are the most significant with regards to potential for long-term consequences of decision making (e.g., susceptibility to infection, pregnancy). Further, the literature on sexual behavior has tended to focus primarily on the decisions regarding which specific sexual behaviors one will practice (e.g., anal or vaginal sex without a condom), with much less focus on decisions regarding sexual initiation and partnering (J. D. Fisher & Fisher, 2000). I will focus my analysis on investigating a dual process model for understanding choices regarding sexual risk-taking (i.e., sex without a condom) in order to build upon much of the prevailing literature regarding sexual decision making.

Prominent models of decision making that have been used to understand sexual behavior have typically relied on “rational” or cognitive decision making processes without considering the role of affect (Albarracín et al., 2005). Despite their strong potential for helping explain sexual decision making, dual process models have been applied to the investigation of sexual risk behavior only once, as far as can be discerned from the literature (Ames, Grenard, & Stacy,
This study examined a dual process model among drug offenders that was based on the social marker hypothesis, which I will discuss in detail in Chapter 2, and found that individuals with impaired affective decision making were more prone to risky sexual behavior. Unlike this study, the prominent theories of decision making in the sexual behavior literature utilize models that can be thought of as focusing exclusively on the result of System 2 (i.e., cognitive or cool) processing. Although these existing models have proven successful in predictions regarding behavior (Johnson et al., 2002; Noar, 2008), their predictions are inconsistent and their effects tend to range from small to moderate in magnitude. This suggests that these theories may warrant novel modifications that incorporate the role of affective processing in order to improve their utility. The leading models of sexual decision making have typically been developed in order to understand sexual risk behavior in the context of the HIV epidemic as an attempt to inform prevention efforts. The continuing spread of HIV and the increasing rates of transmission among some groups (Centers for Disease Control and Prevention, 2012a, 2012b) suggest that new and more powerful models are needed to better understand and curb the spread of the epidemic. Dual process models may be one way to improve upon existing work on sexual behavior by accounting for the role of both systems in sexual decision making, allowing for an understanding of how affect and arousal may influence decisions about sexual risk behavior.

The role of psychological theory has been particularly prominent in HIV research since its discovery in the 1980s. Despite important advances in biomedical prevention, psychological and behavioral issues such as sexual risk behavior continue to be the largest obstacles in curbing the growing HIV epidemic, particularly among gay, bisexual, and other men who have sex with men (Sullivan et al., 2009; Wolitski, Valdiserri, Denning, & Levine, 2001). Although HIV prevention strategies to increase access to and use of condoms have proliferated, the ways in
which people make decisions about condom use is still not well understood and has contributed to the sustained growth of the HIV epidemic. More than 1 million people were estimated to be living with HIV in 2010 and an estimated 47,500 were infected in that year alone (Centers for Disease Control and Prevention, 2012a, 2012b, 2013). Among adolescents and adults in the United States, at least 90% of the new HIV infections in 2011 were estimated to result from sexual behavior alone (Centers for Disease Control and Prevention, 2013). Rates of non-condom use remain high among both HIV-negative and HIV-positive men and women (Durham et al., 2013; Reece et al., 2010; Rosenberger et al., 2012; Sanders et al., 2010; Teitelman, Tennille, Bohinski, Jemmott, & Jemmott III, 2011). The sustained influence of behavioral factors in the ongoing HIV epidemic highlights the need for psychological research to better understand behavioral decision making and inform prevention efforts. Given the importance of condom use in preventing the spread of HIV, psychological theories that better explain condom use behavior by utilizing existing theories of decision making may contribute to a better psychological understanding of sexual decision making while simultaneously making critical contributions to helping curb the modern HIV epidemic.

Because prominent dual process models of decision making used within psychology have yet to be applied to an understanding of sexual behavior, the goal of this dissertation is to investigate an event-level model of sexual decision making that is informed by the literature on dual processes in decision making. Utilizing existing theory and research, I will identify variables that show promise for inclusion as System 1 and System 2 variables in a dual process model. In doing so, I will propose and later test several hypotheses about the interaction of Systems 1 and 2 in predicting sexual risk behavior (i.e., unprotected anal intercourse or UAI) and examine both within-person fluctuations in behavior as well as individual differences in the role
of these within-person processes on behavior. The primary goal of this dissertation is to examine the utility of a dual process framework for understanding decisions regarding condom use.

Although HIV can be spread through any type of sex and to any type of person, HIV disproportionately affects gay, bisexual, and other men who have sex with men (MSM) in the U.S. epidemic. In fact, these men are the only subpopulation for whom rates of HIV incidence continue to rise, with the number of new infections from male-to-male sexual contact increasing despite decreasing numbers across all other transmission factors (Centers for Disease Control and Prevention, 2012a). Although they comprise only a fraction of the total U.S. population (approximately 2-5%), they accounted for nearly two-thirds of all new HIV infections in 2010 (Centers for Disease Control and Prevention, 2012a). These disparities become even more evident within urban centers such as New York City, where gay, bisexual, and other MSM have more than 140 times the risk of contracting HIV and other sexually transmitted infections compared with heterosexual males (Pathela et al., 2011). Moreover, these higher rates of infection exist despite findings that gay, bisexual, and other MSM engaged in higher levels of condom use and HIV testing. These findings suggest that disparities in infection for these men may be at least partially attributable to higher levels of sexual activity, greater rates of HIV seropositivity in their sexual networks, or the increased risk of HIV transmission during anal intercourse. As a result of their high risk for HIV infection and transmission, I will conduct this study using a sample of highly sexually active gay and bisexual men in New York City.

Within the chapters that follow, I provide the background and rationale for such an analysis by first describing in more detail some prominent concepts from dual process theories of decision making and the role of affect and arousal within these models. Next, I review the prominent theories being used presently within the HIV risk literature and describe the current
lack of affective variables within existing models of sexual decision making. I then describe the need for an examination that encompasses not only within-person decision making processes but also examines individual differences in sexual decision making. I end my review with a detailed description of the aims of the proposed study before moving into a description of the methodology for the proposed project.
Chapter 2: Dual Processes in Decision Making

There have been many waves of psychological theory that have attempted to take a new and unique approach to the study of human behavior by studying the processes that contribute to decision making. The psychoanalytic work of Freud attempted to explain much of human behavior as an interplay between unconscious processes of the id, ego, and superego (Freud, 1920). Dissatisfied with these seemingly unobservable and unscientific pursuits, radical behaviorism was popularized by the work of J. B. Watson (1913) and Skinner (1938, 1953) and set out to explain behavior as being the result of reinforcement by external stimuli. Later researchers again became dissatisfied with the focus on external stimuli and shifted their investigations to the role of peoples’ cognitions in driving their behavior, giving way to the cognitive revolution (Miller, 2003). Emotion had been studied and theorized about by early psychologists such as Williams James (1884), who went as far as to suggest a complex interplay between cognitive and affective processes (Lange & James, 1967/1885). However, this research typically assumed that affective processing arose only as the result of cognitive processing and thus could not occur prior to or independent of cognition. Most likely as a result of the assumption that affect is not a measurable behavior or that it is a byproduct of cognition, the role of affective processing in decision making received little attention until quite some time after the behaviorist movement and cognitive revolution took place.

The prominent focus on affective processing in decision making is generally attributed to the pioneering work of Zajonc (1980b, 1984) who examined the extent to which affective processes can occur prior to and independently of cognitive processes and demonstrated that “preferences need no inferences.” He hypothesized that affective responses are the first and foremost human reaction to a stimulus, and that more effortful, cognitive processing occurs
independently and, perhaps, less frequently than its affective counterpart. Based on his findings, researchers began developing this notion into various hypotheses, theories, and models that bestow upon affect a central role within information processing and decision making (e.g., Epstein, 1994). The primary theories that have developed from the work of Zajonc are known as dual process models and focus on an evolutionarily older, rapid, automatic, affectively-based, “hot,” “feeling” system (i.e., System 1) and an evolutionarily more recent, slower, effortful, cognitively-based, “cool,” “thinking” system (i.e., System 2). Dual process models—as I will describe below—have found support for Zajonc’s theory about the role that affect plays in System 1 processing, as well as the role that affectively-based processing plays in assisting, biasing, or thwarting the rationally-based processing of System 2.

As previously mentioned, System 1 is evolutionarily older and common to many animals; it operates quickly and efficiently, occurs implicitly (or unconsciously) and automatically, is qualitative in nature, relies heavily on feelings, affect, experience, and heuristics, utilizes “hot” processing, and has stereotypically been considered a “lower”-order process. In contrast, System 2 is evolutionarily recent and generally considered unique to human thought; it operates more slowly and requires effort, occurs explicitly (or consciously) and deliberatively, is quantitative in nature, relies heavily on mathematical processing, logic, reason, and rationality, utilizes “cool” processing, and has typically been considered a “higher”-order process (Barrouillet, 2011a; Frankish, 2010; Metcalfe & Mischel, 1999; Sloman, 1996; Slovic et al., 2004). The type of processing that occurs within System 1 has been deemed “hot” cognition by some as a result of the role of affect and emotions in biasing its outcomes, and thus the processing within System 2 is sometimes called “cool” (Lepper, 1994; Metcalfe & Mischel, 1999; Redlawsk, 2002).
One of the primary distinctions between Systems 1 and 2 is that System 1 involves the body, making it the domain of affect and arousal and, thus, a “hot” system (e.g., Loewenstein & O’Donoghue, 2007; Metcalfe & Mischel, 1999). Although most researchers do not consider the two systems to be the result of two discrete physical structures within the brain, the distinction made among them is partially a result of evolutionary and neurological features (Loewenstein & O’Donoghue, 2007). The emotional, “go” system was developed in early animals primarily for the purposes of rapidly making so-called fight, flight, or freeze decisions when faced with a threat (LeDoux, 1996). As such, the system relies on characteristics available to all animals—somatic cues, affectively tagged memories, and automatic and non-conscious processing (LeDoux, 1996). As the species developed and humans eventually evolved, the original brain structures remained intact while newer brain structures were added, literally, above them (LeDoux, 1996). As such, it is often the case that the evolutionarily older portions of the brain remain active and used and newer portions of the brain have the ability to exert some form of influence or control over the older systems.

In contrast to the quick, survival-based, affective processing of System 1, the cognitive and deliberative component of System 2 typically utilizes the notion of a cost-benefit analysis to weight long-term goals. The idea of a cost-benefit analyses developed from rational choice theory and expected utility theory, both of which are prominent in many fields of social science, particularly psychology, economics, and political science (Harless & Camerer, 1994; Monroe & Maher, 1995; Riker, 1995). The main tenet of these theories is that people utilize a largely conscious, logical decision making process in order to arrive at decisions that are of the utmost benefit for themselves through what is termed a utility maximization procedure (Mongin, 1998). When presented with multiple options, people engage in cost-benefit analysis to arrive at a single
choice that is intended to maximize their benefit and minimize their loss (i.e., the choice with the highest “expected utility”), taking into account both present and future consequences. The option that achieves the maximum benefit and minimal loss over time is considered the most rational choice, which is thought to be the choice that will be made (Mongin, 1998). Though System 1 processing is generally thought to be the primary mode of decision making as a result of its more efficient, less effortful, and automatic nature, System 2 processing is thought to be able to inhibit, interrupt, modify, or control System 1 (Loewenstein & O’Donoghue, 2007).

The Role of System 1 Processing in Decision Making

The interaction between Systems 1 and 2 have been described differently within various theoretical paradigms. Some theories consider System 1 to be a shortcut that helps to feed information into System 2 (Slovic et al., 2007), whereas other theories describe the two systems as competing for decisional control (Loewenstein et al., 2001). Regardless of the exact details, it is generally agreed that the role of feelings in decision making is central. The importance of affect for decision making is recognized in many dual process theories and has led to the development of three related ideas about the interaction of affective and cognitive processes that I discuss below.

First, Slovic and colleagues have developed the notion of an affect heuristic (Finucane, Alhakami, Slovic, & Johnson, 2000; Slovic et al., 2004, 2007), which refers to a process in which System 1 utilizes affectively-laden information to make split-second decisions. Slovic et al. (2007) define the affect heuristic as:

representations of objects and events in people’s minds [that] are tagged to varying degrees with affect. In the process of making a judgment or decision, people consult or refer to an “affect pool” containing all the positive and negative tags consciously or
unconsciously associated with the representations . . . affect may serve as a cue for many important judgments. Using an overall, readily available affective impression can be far easier—more efficient—than weighting the pros and cons or retrieving from memory many relevant examples, especially when the required judgment or decision is complex or mental resources are limited. This characterization of a mental short-cut leads to labeling the use of affect a “heuristic.” (pp. 1335-1336)

Two features of the affect heuristic are worth noting. First, it is highly efficient, allowing for split-second decisions which can occur in situations that are low in resources for logical or drawn-out cognitive processing. Second, the affect heuristic relies on stored affectively-laden memories, which range in valence from bad to good and differ in their relative strength or salience. The affect heuristic suggests that feelings can hasten and complement rational (i.e., System 2) decision making by influencing cost-benefit analyses to focus on either the risks or benefits of a decision based on whether it is associated with positive or negative feelings.

The affect heuristic was developed to explain how affect is used during decision making processes and research to date has supported its main tenets. Finucane and colleagues (2000) sought to better understand why an inverse association is often found between perceived risks and benefits when, theoretically, the two should be positively correlated. The authors developed the affect heuristic to explain this inverse association, showing that feelings regarding a certain decisional target influence whether people focus either on its risks (i.e., resulting from negative feelings) or benefits (i.e., resulting from positive feelings) and subsequently discount the other. As such, feelings (i.e., System 1) lead to rapid cost-benefit analyses by influencing the cognitive (i.e., System 2) processing of risks and benefits. Since that time, numerous studies have supported this proposed role of affect in risky decision making. For example, one study found
that adding a small loss to a gamble (versus a no-loss gamble) increased the attractiveness of the gamble, suggesting that providing a small loss increased positive feelings towards the potential gain and subsequently increased favorability of the gamble (Bateman, Dent, Peters, Slovic, & Starmer, 2007). Other studies have shown that positive and negative feelings moderate the association between perceived risks and support for policies to reduce those risks (Hine, Marks, Nachreiner, Gifford, & Heath, 2007) and that external events that influence affect such as the weather can change decision making, leading to such outcomes as increased stock market returns on a given day (Hirshleifer & Shumway, 2003). Taken together, findings support the role that affect can play in speeding up cost-benefit analyses by biasing individuals towards focusing more on costs or benefits based on their subjective feelings about the outcome.

Building upon some of the work on affect primacy by Zajonc (Zajonc, 1980b, 1984) and the notion that affective System 1 processing can assist with deliberative System 2 processing (Slovic et al., 2007; Slovic, Peters, Finucane, & MacGregor, 2005), another theory describes how bodily states can influence the role of affect in decision making. In the Somatic Marker Hypothesis (SMH), Damasio (1994, 2001) proposes that affect may be so important for decision making that people are unable to make personally advantageous decisions without an intact affective or emotional processing system. The SMH suggests that, in many situations, an intact affective processing system not only complements System 2-based rational decision making, but that such affective processing is necessary to successfully execute cost-benefit analysis that ultimately leads to decisions that are in one’s best interest. Through experiences with patients with brain damage and later experiments with them and others, Damasio reported in his book on the crippling role that losing emotion processing centers within the brain can have on rational decision making. In his description, Damasio hypothesized and later confirmed with his own
research that cognitive processes are inadequate for decision making in the face of difficult
decisions or conflict. In cases of difficult or conflict-laden decisions, people typically rely on an
unconscious awareness of psychophysiological phenomena (e.g., increased heart rate) to
generate affective cues to assist with more rapid decision making.

The underlying tenet of SMH is that the brain and body operate within a feedback loop in
which bodily (i.e., somatic) states provide cues to the brain about physiological arousal that
relates to the primary emotions (e.g., fear, sadness, happiness) and the brain similarly provides
signals to the body to activate cascades of somatic arousal that correspond to primary emotions.
These feelings are associated with experiences and thus provide automatic, “gut reactions” when
making decisions. These gut reactions can be thought of as the intuitive, automatic, and emotion-
based (i.e., System 1) counterpart of the cost-benefit analysis (i.e., System 2) in rational actor-
based theories—these reactions provide an immediate, qualitative feeling about the relative
goodness or badness of a potential option. Combined with the affect heuristic, this suggests that
bodily states may influence decision making by leading to positive or negative affect and
subsequently cuing decision making to focus on either benefits or risks of a specific decision.

Building on Damasio’s early work, several studies have shown that individuals with brain
damage are unable to utilize the somatic-affective link and thus have poorer decision making
(e.g., Bechara, Damasio, Damasio, & Lee, 1999; Bechara et al., 2001; Bechara, Tranel, Damasio,
& Damasio, 1996). Other lines of research not focused on individuals with brain damage have
similarly found support for the SMH. Researchers have shown that individuals who have poor
physiological responses to risky decision making persist in making risky choices, despite
conscious awareness of the risk (Suzuki, Hirota, Takasawa, & Shigematsu, 2003). A similar study
demonstrated that the strength of autonomic afferent feedback (i.e., “gut feelings”) was
correlated with success on a decision making task, indicating that the influence on decision making is proportional to the strength of the bodily cues (Carter & Pasqualini, 2004). A third study has found that false bodily feedback can also influence decision making, with individuals tending to favor decisions that were randomly associated with strong indicators of bodily response (e.g., false heart rate feedback; Batson, Engel, & Fridell, 1999). Taken together, these studies suggest that bodily feedback leads to the generation of mental feelings which, in turn, bias decision making.

Though the affect heuristic and the SMH assume that Systems 1 and 2 can be mutually advantageous to each other, the third concept posits that, at least under certain conditions, the two types of processing can conflict. Lowenstein and colleagues developed the notion of conflict between the two systems in their risk as feelings hypothesis (Loewenstein et al., 2001; Slovic et al., 2004). The basic tenet is that, under times of stress or risk, the simultaneous processing of affect and cognition can lead to conflicts between the two, in which case the faster, more automatic, and affectively-based System 1 will likely dominate. In contrast to rational actor views of people as going through mental calculations of a cost-benefit ratio to arrive at a decision that is of utmost benefit to them, this hypothesis relies on a notion similar to the affect heuristic that people utilize affectively-based processing to make quick decisions. The risk as feelings hypothesis builds upon other theories about the primacy of affect but diverges from them to provide an understanding of how affect might thwart rather than complement cognitive processing within risky decision making. The theory proposes that cognitive and affective processing occur simultaneously and within a feedback loop and, much like the affect heuristic, that affect predominates decision making. However, unlike the affect heuristic—in which affect is seen as promoting rational decisions by simply allowing them to occur more rapidly and with
less effort—the *risk as feelings hypothesis* proposes that conflicts can emerge within the simultaneous processing of cognitive and affective systems during risky decision making. In the context of these models, risky decisions are any in which outcomes are uncertain but consequential. In cases of conflict, affective processing is utilized for making behavioral decisions, which means that the behavioral outcome may be in conflict with the choice that would have resulted from the more rational, cognitively-based system.

The competitive nature of affective (i.e., System 1) and cognitive (i.e., System 2) processes under times of risk was highlighted in an article focusing on the ways in which probability can influence decision making when making affect-poor versus affect-rich decisions. Rottenstreich and Hsee (2001) showed that, compared to decisions when the outcome had little impact on affect, decisions that pose affective risk are strongly influenced by probability of an event. Specifically, immediate departures from impossibility (i.e., 0% probability) and certainty (i.e., 100% probability) receive much more weight than do intermediate levels of probability. The authors suggest that this results from the production of hope (resulting from an increase from impossibility to slight possibility) or fear (resulting from a decrease from certainty to slight uncertainty), which leads individuals to attend more strongly to these decisions. The heightened sense of arousal or risk that results from slight departures from impossibility or certainty result in stronger weight being placed on a decision than would have been if it were moderately probable or remained impossible or certain. These findings suggest that decisions in which probability is uncertain but high may produce fear and lead to affective processing aimed at decreasing uncertainty of the potential outcome and that these short-term consequences would be weighted more strongly than would be predicted by “rational” models of decision making (which assume a focus on long-term risks and benefits).
**Dual Process Models in Social Psychology: Interactions between Personality and Context**

As previously discussed, dual process models are utilized throughout many areas of psychology, and are often used to describe processes of memory, learning, reasoning, and decision making. Within the social psychological literature, dual process theories of decision making often integrate social psychological theories and constructs that relate them more strongly to interpersonal pursuits, social systems, and personality. As I describe below, one prominent line of social psychological dual process models developed as a result of early work by Mischel and colleagues (Metcalf & Mischel, 1999; Mischel & Shoda, 1995).

Mischel and Shoda’s (1995) cognitive-affective personality system (CAPS) theory is a prominent social psychological dual process decision making theory. The authors provided a theoretical lens through which to understand the interaction of personality, context, and decision making. More specifically, they proposed a theory to understand consistency and individual differences in behavior in light of the fact that situational inconsistencies in behavior are also present. They proposed that features of situations set in motion a series of cognitive and affective processes that are based on prior experience. These cognitive-affective processes influence both current personality as well as interpretations of the current situation. Their theory put forward the notion that individuals have dispositional traits that lead to profiles of cognitive and affective processing. These profiles, in turn, interact with the situation or context to produce behavior, thus legitimizing the existence of both dispositions and situational variability. The CAPS theory led to several important lines of theory and research that share a common idea about the ways in which affective and cognitive processing can conflict and produce discrepancies between long-term intentions and behavior and how social, personality, and contextual characteristics can influence these discrepancies.
Metcalfe and Mischel (1999) utilized the CAPS theory to develop a theory regarding hot and cool processing and the delay of gratification. This dual process theory proposes that an affective, reflexive, stimulus control, “go” system (i.e., System 1) coexists with a cognitive, reflective, self-control, “know” system (i.e., System 2) and that the two systems have functional differences and interact to produce behavior. Their theory proposed several conditions under which the “cool control of hot impulses” (Metcalfe & Mischel, p. 8) is expected to fail. One such condition is acute stress, with increasing levels of stress leading to increasing deficits in the ability to utilize cool processing to temper hot processing. In many ways, this mirrors the notion that System 1 dominates System 2 under times of risk within the risk as feelings hypothesis.

Another such condition that is similar to the first is that of a chronic environmental condition. While acute stress is likely to be a situational factor, chronic environmental conditions are likely to be precursors to dispositional traits or dispositional traits themselves. For example, one might assume that chronic anxiety could lead to disruptions in cool processing as well as potentially increasing acute levels of distress. Their theory predicts that the default human behavior is to give in to temptation, which results from activation of the hot processing system. However, their theory also predicts that thinking of the cool aspects of the situation will reduce the influence of hot processing and lead to increases in the ability to delay gratification or otherwise engage in behavioral control. For example, in a tempting situation, one might focus on the cool aspects such as one’s intentions or the behavioral consequences rather than the hot aspects such as one’s desires in order to engage in goal-directed behavior. This application of the CAPS to an understanding of the delay of gratification paradigm provides meaningful predictions regarding the interplay of personality and context as well as the interaction and outcomes of System 1 and
System 2 processing. This interplay is central to several theories and models regarding the role of personality, context, affect, and arousal on decision making.

Social psychological theories of decision making are particularly well-suited to incorporate dispositional traits related to interpersonal functioning into models of how and why people make the decisions they do when acting as agents in a social world. Applying the CAPS theory and the notion of dispositional-situational interactions to a specific domain of personality, Downey and Feldman (1996) developed the notion of rejection sensitivity to explain a trait that can lead to different profiles of cognitive-affective processing. Rejection sensitivity is a cognitive-affective processing disposition in which people chronically expect to be rejected and, as a result, anxiously avoid the situations in which such expectations are activated. As a dispositional trait, rejection sensitivity leads to certain profiles of cognitive and affective processing such as hypervigilance and fear. As a result of this dispositional tendency towards hypervigilance and fear, individuals perceive situations differently than others and subsequently may engage in altered behaviors as a result of these processing differences. Further, these distinct profiles of cognitive-affective processing and concomitant behavioral manifestations may lead to cycles in which rejection actually becomes more likely and thus reinforces their dispositional tendency to expect rejection. Thus, rejection sensitivity not only produces fear within interpersonal situations, it leads individuals to process the situation differently and to seek strategies to avoid rejection. Rejection sensitivity is a strong theory for better understanding the ways in which interpersonal traits may influence how and why people make the decisions they do within a variety of interpersonal decision making situations.

In addition to personality factors, Mischel and colleagues also described the importance of contextual factors in influencing cognitive-affective processing. Such contextual factors can
come in various forms, including both internal and external stimuli. Loewenstein and O’Donoghue (2007) outlined several characteristics of environmental stimuli that can lead affective processing to interfere with cognitive or deliberative processing as proposed in the risk as feelings hypothesis (Loewenstein et al., 2001). They argue that several key characteristics of the environment have strong influences on affective processing though relatively weak influence on deliberative, cognitive processing. First, the temporal proximity of the stimulus (i.e., its immediacy) is highly influential. Consequences that are temporally closer are likely to lead to strong activation of the affective system. Similarly, non-temporal proximity such as physical closeness can also lead to increases in affective processing and produce results inconsistent with an individual’s intentions. Finally, the vividness of a stimulus, such as the ease and speed with which it can be imagined or represented, increases affective processing. In fact, the authors base much of this work on the work of Mischel reviewed previously. This work demonstrated that specific contextual characteristics—proximity and vividness—that would increase affective processing, lead to a focus on short-term rather than long-term outcomes, and interfere with the long-term focus of System 2 (i.e., cognitive) processing.

Along with his work on decision making under affective conditions in general, Loewenstein (1996) outlined several propositions about the role of arousal—an internal stimulus—on decision making. As outlined in the paper, more intense levels of arousal are able to produce greater discrepancies between intentions to act in one’s self-interest and actual behavior while experiencing arousal. Similarly, when people imagine future decision making, they give the influence of arousal significantly less weight in influencing a future decision than it actually has at the moment of decision making. As such, the intensity of arousal may be directly and inversely related to the extent to which people are able to act in accordance with their
intentions versus their feelings. Proximal sources of arousal are also likely to produce an appetitive response which can increase one’s levels of impulsivity. Further, people may tend to overestimate their own confidence and skill in executing a behavior by underestimating the role that arousal has played and will play in their making of decisions. In line with all of these propositions, people are prone to discount the role that arousal will have on future behavior and the role it has played in past behavior. These propositions regarding the impact of arousal on decision making suggest that the role of intentions, self-interest, and self-efficacy in driving decision making may be less than for decision making that occurs in domains without high levels of arousal.

Taken together, the theoretical contributions of Mischel’s and Loewenstein’s work with their colleagues on processes that lead to a focus on short rather than long-term consequences of decision making suggest the notion of decisional myopia. Put another way, they provide theoretical and empirical basis for conditions under which an individual’s intentions can be thwarted in momentary decision making as a result of individual traits, the context in which the decision is being made, and through the activation of affective or “hot” processing. Under conditions in which there is a potential consequence that may occur at any moment, is nearby, and can be vividly represented in the mind, levels of affective processing are likely to increase, shifting focus from long-term to short-term thinking, and undermining the types of behaviors individuals intend to engage in while in states not characterized by arousal or affective processing (Loewenstein & O’Donoghue, 2007). Loewenstein and O’Donoghue utilize the example of food in their manuscript. For a typical individual, the presence of food may slightly increase hunger which produces eating that is in line with both affective (i.e., hunger) and cognitive (i.e., the need to eat) processing. However, for individuals on a diet, the temporal and
physical proximity of food as well as the vividness with which they are able to imagine eating the food is likely to increase affective processing (i.e., the feeling of hunger). This increase in affect processing leads to a shift in focus from their long-term goal of losing weight to their short-term goals of fulfilling their hunger and thereby thwarts cognitive processing. It is worth noting that these effects occur only when affect and cognition have different motivations or goals—increases in affective processing do not thwart deliberative or cognitive processing when both affective and cognitive systems are attempting to achieve the same end (Loewenstein & O’Donoghue). This line of research suggests that, when immediate states of emotion (e.g., anger, fear), drive states (e.g., hunger, thirst), arousal (e.g., sexual, substance-induced), and others (e.g., pain, discomfort, nausea) are high, individuals will focus decision making on evaluating the short-term consequences of these states rather than the long-term consequences of the outcome.

Several theories have suggested and demonstrated that affect and arousal can have direct influences on decision making by leading to subsequent discrepancies between intentions and behavior, generating increases in impulsivity, and interacting with dispositional, contextual, and interpersonal processes. Individual characteristics such as stress, distress, and personality (e.g., rejection sensitivity) can lead to differential evaluation of situational stimuli (Downey & Feldman, 1996; Mischel & Shoda, 1995). Contextual and environmental stimuli and their subsequent evaluations, in turn, can lead to increases in affective processing (Loewenstein, 1996; Loewenstein & O’Donoghue, 2007; Metcalfe & Mischel, 1999; Mischel & Shoda, 1995). For example, proximity of a perceived stimulus or the vividness with which it is imagined can increase affective processing. When affective processing is focused on an immediate outcome or consequence and cognitive processing is focused on long-term goals and intentions, the two are in a state of conflict (Janis & Mann, 1977). Under such states of conflict, increases in affective
processing induced by factors such as personality and situational cues are likely to lead to a state of myopia, leading to behavior that is consistent with affective rather than cognitive processing. Put another way, under various conditions (i.e., risk/conflict, heightened affect, proximity and vividness of a decision object), it may be normative for individuals to act in ways that favor short-term gains over long-term consequences (or minimizing short-term consequences over maximizing long-term gains) despite this being inconsistent with traditional “rational” views of decision making.

Summary

Throughout this chapter I have focused on several theories that lend support to the role of feelings in decision making and the notion of decisional conflict or myopia. When considered together, these theories provide testable hypotheses regarding the conditions under which such processes and outcomes are likely to occur. For example, the affect heuristic suggests that feelings are used to speed up the process through which decisions are made by biasing decision making towards focusing on risks or benefits of an outcome; the SMH extended this by incorporating the role that the body (i.e., “somatic markers”) plays in leading to these affective feelings of “goodness” or “badness.” Proposing a similarly central role for affect and System 1 processing but describing the ways in which it can conflict with System 2 processing under times of risk or conflict, the risk as feelings hypothesis provides an understanding of the ways in which people can make decisions that are “illogical” or inconsistent with their goals and intentions. Social psychologists have utilized similar theories of cognitive-affective processing or “hot”/”cool” processes to explain how characteristics such as proximity and vividness can cause difficulties with acting in one’s best interest (e.g., delaying gratification) and this has been applied to interpersonal processes within the rejection sensitivity literature. Finally, I reviewed
theories about the role of arousal on decision making and demonstrated that arousal—combined with contextual features and feelings of risk—can lead to unanticipated decisions and an inability to recognize the role arousal has played or will play in past and future decisions. I proposed that these theories, taken together, provide support for the notion that individuals may develop a sense of decisional myopia under conditions of high affect, perceived risk or uncertainty, and arousal, and that this may lead to some of the inconsistencies observed in individuals’ intentions and behaviors. However, my focus throughout this review has been on decision making in general. In the next chapter, I begin by reviewing the current state of the sexual decision making literature followed by a review of the existing empirical work regarding the role of affect and arousal in sexual decision making, specifically.
Chapter 3: Research on Sexual Decision Making

In order to better develop a new model of event-level sexual decision making that incorporates both affective and cognitive components, it is important to understand what models are currently being used, how successful they have been, and which variables have proven most effective for understanding sexual decision making thus far. Researchers conducting work on HIV prevention have utilized several theoretical models to understand the processes that lead to sexual risk behavior in order to subsequently intervene on these processes and reduce HIV risk. According to meta-analytic and review work (Albarracín et al., 2005; Noar, 2007), the most widely used theories to explain sexual decision making in the HIV literature are: the theories of reasoned action and planned behavior (TPB; Ajzen, 1991; Fishbein, 1990; Fishbein & Middlestadt, 1989; Montaño & Kasprzyk, 2002), the health belief model (HBM; Janz, Champion, & Strecher, 2002), social cognitive theory (SCT; Bandura, 1976, 1989, 2001), and the information-motivation-behavioral skills model (IMB; J. D. Fisher & Fisher, 1992; J. D. Fisher, Fisher, Misovich, Kimble, & Malloy, 1996; J. D. Fisher, Fisher, Williams, & Malloy, 1994; W. A. Fisher, Williams, Fisher, & Malloy, 1999). As I review below, this research has had some success, but inconsistencies in the utility of these theories may stem from several limitations including what has typically been a narrow focus on cognitive antecedents of behavior without attention to the role of affect (Albarracín et al., 2005) and a focus on cross-sectional and aggregated sexual behavior data rather than longitudinal models that account for within-person variation (J. D. Fisher & Fisher, 2000).

Sharing common roots in the expected utility and rational actor theories discussed previously that rely heavily on System 2 processing, these models utilize cognitive components that were picked to be applicable to health behavior and sexual risk behavior, specifically. Given
their shared roots, each model includes behavioral expectancies—i.e., beliefs about the costs and benefits of engaging in a behavior—as a core component. In addition to behavioral expectancies, which are common across all four theories, one other common element is Bandura’s (1976, 1989, 2001) notion of self-efficacy. Self-efficacy refers to the extent to which people believe that they are able to perform a given behavior in order to produce a given outcome (Bandura, 1977). Both behavioral expectancies and self-efficacy are inherently a result of System 2 processing, as both rely primarily on beliefs which stem from the cool/thinking rather than hot/feeling system. In addition to beliefs regarding the benefits and costs of a given behavior, a person’s belief that she or he can successfully perform the behavior is a second consideration when making behavioral decisions and is considered to be one of the primary influences on outcome expectancies in SCT. To the extent that a person believes she or he is unable to perform a behavior with competence, the likelihood that she or he will intend to or actually perform the behavior becomes lower. Each of these theories shares the two common elements of SCT, expectancies and self-efficacy, and will be referred to as SCT-based theories herein. In addition to sharing the common elements of SCT, each of the four models has its own unique components and history of empirical research.

The theory of reasoned action is well known for considering behavioral intentions to be the only direct antecedent of behavior itself, though the TPB added perceived behavioral control (i.e., self-efficacy) as a second direct predictor (Ajzen, 1991). Behavioral intentions arise as a result of explicit (i.e., System 2) attitudes towards the behavior and social norms about the behavior, as well as being thought to be at least partially attributable to self-efficacy. Thus, the two direct antecedents of behavior in the TPB are behavioral intentions and self-efficacy which are both explicitly a result of System 2 processing. One of the primary limitations of this theory
is that it considers two relatively stable and entirely cognitive variables to fully account for the complexity of human sexual behavior.

Despite relying exclusively on System 2 decision making processes, researchers over the past three decades have demonstrated modest findings using the TPB to predict behaviors such as condom use. For example, several meta-analyses of the theory and its association with condom use have found support for each component of the model (Albarracín, Johnson, Fishbein, & Muellerleile, 2001; Sheeran & Orbell, 1998; Sheeran & Taylor, 1999), with average effect sizes in the modest to moderate (i.e., effect sizes of .20 to .60) range. Albarracín and colleagues (2001) found support for the model across 96 studies with heterogeneous samples. As suggested by the theory, subjective norms, attitudes, and perceived behavioral control all predicted intentions to use condoms, and intentions to use condoms had a direct effect on future condom use. However, the meta-analysis revealed stronger associations between intentions and behavior when assessing behavior retrospectively rather than prospectively, suggesting people may have based their intentions at least partially on prior behavior. Not surprisingly, the authors also found significant heterogeneity in the associations between TPB variables and sexual behavior outcomes across studies. These findings demonstrate the breadth of the theory’s use while also highlighting the considerable amount of variability that is unexplained by the model as it currently exists.

As its name suggests, the Health Belief Model is a model whose core components are a person’s beliefs about a given health behavior and has been called a model of conscious decision making (J. D. Fisher & Fisher, 2000). The four primary beliefs on which the model focuses are: a) a person’s perceived benefits of performing the behavior, b) perceived barriers to performing the behavior, c) perceived susceptibility to the condition the behavior prevents, and d) perceived
severity of the condition the behavior prevents. In addition to these four beliefs, the model focuses on a person’s self-efficacy to engage in the behavior. The first two of the beliefs—perceived benefits and perceived barriers—have to do with the traditional cost-benefit analysis (i.e., System 2) from expected utility theory. Perceived susceptibility and severity are collectively known as perceived threat and have to do with the perceived odds of a behavior leading to a health condition and how serious the health condition would be, respectively. Unlike measuring the extent to which a person feels positively or negatively about a behavior (i.e., qualitative, System 1 processing), perceived threat relies on an objective assessment of the odds (i.e., quantitative, System 2 processing) of a certain outcome. A meta-analysis conducted two decades ago of studies that were deemed to have measured all components of the HBM found only 16, and results suggested the 16 studies had significant heterogeneity in their effects (Harrison, Mullen, & Green, 1992). Furthermore, the standard cost-benefit variables fared better than the more unique perceived threat variables, and this finding was confirmed in a recent meta-analysis conducted on 18 studies (Carpenter, 2010). However, neither of these studies was exclusive to HIV risk behavior and no such analysis appears to have been conducted to date. This suggests that, to the extent the HBM has been used to study sexual behavior, research has been conducted by selecting components in a piecemeal fashion rather than being consistently tested as a model of decision making and results regarding its utility have been equivocal (J. D. Fisher & Fisher, 2000). Results indicate that the additional cognitive components of the HBM may improve very little upon the basic cost-benefit analysis that often forms the core component of System 2 processing.

In developing the IMB model, J.D. Fisher and Fisher (1992) synthesized the existing HIV prevention literature and determined that HIV risk behavior change was the result of three
fundamental antecedents—possessing information regarding HIV, its transmission, and how to prevent it; having a personal sense of motivation to prevent one’s own acquisition of HIV through behavior change or maintenance; and having the behavioral skills necessary to enact such changes. The IMB model shares much in common with the elements of TPB and, like the TPB, the IMB model relies exclusively on System 2 processes to predict behavior. For example, although motivation might be thought to be at least partially feelings-based, the definition of motivation in the IMB is quite similar to that of intention within the TPB. Behavioral skills within the IMB model involve both having a sense of self-efficacy for performing the behavior as well as objectively possessing the specific skills necessary to perform the behavior, both of which result from cognitive, System 2 processing. Unlike the TPB, the IMB model specifies that behavioral skills result from having adequate information and motivation, with all three having direct effects on behavior itself. All three of the IMB constructs have been supported by research specifically on HIV risk behavior, demonstrating both through model-based testing of structural relationships and through mechanisms of change in intervention research that information, motivation, and behavioral skills are all associated with sexual behavior (J. D. Fisher & Fisher, 2000; J. D. Fisher, Fisher, & Shuper, 2009). Although it has been one of the most successful models of sexual decision making, the IMB model, like the others reviewed, has substantial room for improvements that take into account variables that may interfere with the motivational and informational components and reduce their impact on behavior.

Overall, nearly three decades of research have led to promising but modest and inconsistent results using SCT-based theories to inform basic and prevention research for gay and bisexual men (Johnson et al., 2002). Several large meta-analyses conclude that these theories lead to successful theory-based interventions, and that key components of them such as self-
efficacy and behavioral skills predict behavior and can be intervened upon to enact behavior change (see Noar, 2008 for a review). However, findings suggest that there is also significant room for improvement with these models, with effect sizes still in the small to modest range. For example, although the TPB is the most widely used and has demonstrated efficacy, cross-sectional associations between TPB variables and behavioral outcomes tend to be moderate and research on the predictions of these models using prospective (Albarracín et al., 2001) or longitudinal data (Huebner, Neilands, Rebchook, & Kegeles, 2011) has shown them to perform less well. These mixed results are potential artifacts of two primary characteristics of this literature that likely result from a limited amount of collaboration between decision making researchers (who use dual process theories but do not study sex) and those studying sexual behavior (who study sex but do not use dual process theories). First, as has been discussed at length, these models typically account for only System 2 processing and may be neglecting the added predictive power that might be added by examining System 1 processes such as affect and arousal. Second, these models and the research that has been used to test them have typically explained behaviors—which occur across a series of contexts and times—using aggregated data about them. In doing so, the role of intraindividual variability and momentary influences on decision making are often left out in favor of dispositional traits and presumed behavioral consistency. Although these models provided a critical first step in gaining a better understanding of sexual decision making, their utility is likely to be substantially increased by incorporating research on decision making that has been done outside of the literature on sexual behavior.

In order to improve upon these models, it may be most effective to retain their best features as components of System 2 processing and adapt them within a dual process framework
by incorporating the role of System 1 processing. A detailed meta-analysis of the HIV prevention literature provides insight as to which specific components of these various theories might be the most promising for influencing sexual decision making (Albarracín, Durantini, & Earl, 2006). The study examined 194 separate manuscripts reporting on more than 446 different datasets from theory-based HIV prevention interventions. Across all of the theories reviewed above, the authors found strong support for attitudes, self-efficacy, and behavioral skills, fair support for the role of social norms, and poor support for the role of perceived threat. When examining samples of gay, bisexual, and other MSM, the attitudinal component of these SCT-based theories was less effective than the others just described and self-efficacy was believed to be one of the largest factors that influence the behavior of gay, bisexual, and other MSM. Summarizing their results, the authors note, “people are unlikely to change unless they want to, believe they can, feel they will, and have the behavioral skills to actually change” (p. 879).

In sum, the SCT-based models of sexual decision making have been partially effective, particularly when considering the specific role of self-efficacy and its related constructs (i.e., perceived behavioral control and behavioral skills), but their success has been mixed and has varied widely across methods of assessment and populations of interest. These mixed results are most likely a result of the fact that the models assume that decision making arises strictly from rational, cognitive processing that is relatively stable over time. Core components of the models such as intentions, beliefs, and information explicitly leave out the reality that affect and arousal play during sexual situations. Moreover, because these core components are thought to be relatively stable, there is little room for explaining variability in sexual behavior that naturally occurs. While stable predictors may be useful for determining types of people who do and do not ever engage in certain behaviors (e.g., unprotected sex), they are unlikely to provide substantial
insight into the processes that occur over time that lead individuals to engage in condom use at some times and not at others. Although some individual can be differentiated in such ways due to highly consistent behavior, this is unlikely to be the norm (Cooper, 2010). In order to more fully account for the true influences on sexual decision making and behaviors, more data are needed that examine not only individual differences in decision making but also the within-person processes that more directly account for such fluctuations in behavior over time. In doing so, researchers can account for those between-person factors—such as those successfully identified in the wealth of sexual behavior research to date—that either directly influence behavioral outcomes or influence behavior through their influence on within-person fluctuations in decision making processes. In the section below, I describe existing evidence regarding the role of affect and arousal in sexual decision making. In the chapter that follows, I consider the issue of between- and within-person effects and their role in sexual decision making.

Research on Affect and Sexual Decision Making

Exploratory research investigating associations between System 1 (i.e., affective) processes and sexual behavior has been conducted, though it has not typically been done using theories of decision making. One meta-analysis conducted more than ten years ago examined 34 different studies that included an examination of the relationship between negative mood and sexual behavior and found mixed results (Crepaz & Marks, 2001). The study found that there was significant variability in both the magnitude and the sign of the association between negative mood and behavior. While some studies found significant positive associations, others found significant negative associations and the overall effect size across studies was not significantly different from zero. Specifically, the authors focused on two forms of negative mood—anxious and depressive symptoms. The authors found that the weighted average of the two types of
negative mood did not significantly predict sexual behavior nor did they differ significantly in their effects on sexual behaviors. The authors concluded that there was not sufficient evidence to establish that negative mood was associated with sexual risk behavior, though they found evidence of a trend whereby negative mood was more predictive of sexual behavior for gay, bisexual, and other MSM than for other samples. Although this meta-analysis provided a useful synthesis of the extent to which affective processes have been included in research on sexual behavior to date, the studies included had a variety of limitations.

Most if not all of the studies reviewed in the meta-analysis investigated mood. While mood certainly warrants investigation, it is considered a long-lasting predisposition towards certain forms of emoting or affect rather than the momentary experience of feeling that is available to influence a specific decision. The Diagnostic and Statistical Manual (DSM-IV-TR) of the American Psychiatric Association (2000) defines mood and distinguishes it from affect:

[Mood is] a pervasive and sustained emotion that colors the perception of the world.

Common examples of mood include depression, elation, anger, and anxiety. In contrast to affect, which refers to more fluctuating changes in emotional “weather,” mood refers to a more pervasive and sustained emotional “climate.” (p. 825)

In a response to the meta-analysis, Kalichman and Weinhardt (2001) describe several limitations of the studies that Crepaz and Marks reviewed. Prominent among these limitations were concerns that the studies relied on global mood assessments rather than the role of affect at the time of sexual behavior as well as being overwhelmingly cross-sectional. Though some have used affect as an umbrella term encompassing mood, emotion, and feeling, I utilize affect and feeling interchangeably to describe a momentary state or experience of either basic emotion or more general, transient feeling states (Schwarz & Clore, 2007). I contrast affect and feelings with
mood, which is a tendency, predisposition, or aggregated experience of affective or feeling states that typically has no specific trigger or referent and are of more substantial duration (Schwarz & Clore, 2007; VandenBos, 2007). As such, I presume that affect is more specific and fleeting than mood but less specific than discrete emotions. As mentioned previously, constructs that are able to fluctuate momentarily may pose more potential for explaining intraindividual variation in behavior over time than would a long-lasting, dispositional construct such as mood.

Despite the lack of findings for negative mood and, more specifically, anxiety, research looking at the association of state levels of affect and sexual behavior has revealed different results. A small but significant body of literature has begun to develop regarding the association of fluctuating levels of affect with intraindividual variability in sexual behavior by using methodologies such as daily diary research. Studies that have involved an assessment of specific, fluctuating affect have found them to influence sexual decisions made on an event-level basis (Fortenberry et al., 2005; Grov, Golub, Mustanski, & Parsons, 2010; Mustanski, 2004, 2007; Shrier, Shih, & Beardslee, 2005). Grov et al. (2010) found that, among highly sexually active gay and bisexual men, daily negative affect reduced the risk of unprotected anal sex on a given day. On days when men felt higher levels of negative affect, they had lower odds of engaging in unprotected sex than on days when they had lower levels of negative affect. Mustanski (2007) investigated the role of anxious, negative, and positive affect on a composite variable of sexual risk behavior within a diary study of MSM. Utilizing both trait and state measures of anxious affect, he found that increases in state anxiety (i.e., within-person fluctuations) were associated with increases in risk while increases in trait anxiety (i.e., between-person differences) were not associated. These findings suggest that dual process models of sexual decision making that
incorporate the role of anxious affect at the event level (i.e., within-person) may provide promising results, particularly among gay, bisexual, and other MSM.

**Research on Arousal and Sexual Decision Making**

Research has demonstrated that sexual arousal can influence sexual decision making. One early study demonstrated an association between sexual arousal and condom use, showing that higher levels of sexual arousal at the initiation of sex were associated with less usage of condoms (Boldero, Moore, & Rosenthal, 1992). Following that, several experimental studies have shown the impact that arousal can have on sexual decision making. Blanton and Gerrard (1997) recruited a sample of male undergraduates and randomized them to receive an image of a woman rated to be of high or low sex appeal. Men who viewed images of the women with high sex appeal discounted the level of risk she posed for sexually transmitted infections as well as the need to use condoms with her. This study demonstrated that sexual arousal may influence the cognitive processing of risk estimates. It is possible that arousal influences sexual decision making in one of two ways: arousal may directly influence cognition by altering risk perceptions, or arousal may interact with cognition, thwarting cognitive processing and thereby reducing the ability to access and utilize accurate estimates.

Support for the hypothesis that arousal thwarts cognition rather than being mediated by changes in cognition was partially supported by another study. Loewenstein, Nagin, and Paternoster (1997) investigated whether sexual arousal would influence men’s willingness to engage in sexual aggression. They confirmed their hypothesis that men who were sexually aroused were subsequently more willing to engage in forceful and coercive means to achieve sex. However, the authors also hypothesized that these effects would be mediated by changes in the perceived costs and benefits of engaging in such behaviors. Although costs and benefits were
related to behavior, the authors found no support for the notion that the influence of sexual arousal on behavior was mediated by changes in perceived costs and benefits. Further, the authors also found no support for the notion that arousal was mediated by other cognitive variables. Though the authors had insufficient power which prevented them from testing interactions between arousal and cognitions, this study suggests that arousal is not mediated by cognition and leaves open the possibility that its effect on behavior may result partially by interfering with cognitive processing.

Another potential route for the influence of arousal on decision making is through increases in sexual motivation and desire. Ariely and Loewenstein (2006) investigated the influence of sexual arousal on the attractiveness of different sexual activities, participants’ willingness to engage in coercive measures to achieve sex, and on willingness to engage in sexual risk behavior. The study found that sexual arousal influenced all three domains. Specifically, higher levels of sexual arousal increased the relative attractiveness of various sexual activities. Even activities that were judged to be unattractive without arousal were later deemed attractive under conditions of arousal. Similarly, participants seemed less concerned with norms and ethics while sexually aroused and were more willing to engage in acts such as coercion in order to obtain sex. Finally, higher levels of sexual arousal increased participants’ willingness to engage in sexual risk behavior. Not surprisingly, sexual arousal did so at least partially by increasing participants’ level of motivation and desire to have sex. This provides support for the notion that individuals under states of sexual arousal become increasingly myopic, focusing more on momentary desires and threats and less on long-term goals and consequences.

A final study has supported the notion that arousal may thwart cognitive processing and may result in decisional myopia. Researchers recruited men who reported high intentions for
using condoms and examined the role of sexual arousal on discrepancies between past and imagined behavior (Ditto, Pizarro, Epstein, Jacobson, & MacDonald, 2006). Specifically, the researchers found that participants in low arousal conditions predicted future sexual behavior that was consistent with their past behavior. However, those participants in the sexual arousal condition had a significantly higher likelihood of reporting that they would be likely to engage in sexual risk behavior in the future. The authors conducted additional analyses which demonstrated that participants who were aroused had significantly fewer thoughts about the risks of unprotected sex and significantly more thoughts about the attractiveness of their partners. The authors did not find support for the notion that decreased risk perception mediated the association between arousal and behavior, thus suggesting—but again, not testing—the possibility that arousal does so by reducing or interfering with cognitive processing. These findings again support the suggesting in the affect heuristic that positive feelings (i.e., sexual arousal) about a behavior (i.e., sex) lead to an increased focus on benefits and a decreased focus on risk and that, as a result of focusing on these short-term benefits rather than long-term consequences, arousal leads to discrepancies between intentions and behavior.

Though much of the research on arousal and sexual decision making has been conducted experimentally, some research has also been done on real-world behavior. Mustanski (2007) utilized a daily diary methodology for a sample of MSM. He utilized both trait and state measures of sexual arousal and examined their effects on a composite of sexual risk behavior. Results demonstrated that, although trait-level sexual arousal (i.e., having higher average levels of sexual behavior than other individuals) was not associated with risk behavior, state-level sexual arousal (i.e., having higher levels of sexual arousal on a given day compared with other days) was associated with increases in risk. This study supports experimental findings regarding
the role of arousal in sexual decision making using observational research and suggests these findings have ecological validity.

Taken together, this research provides empirical support for the notion that heightened levels of arousal may lead to a state of decisional myopia whereby individuals make decisions based on short-term rather than long-term implications. These studies suggest that individuals who are “in the moment” and under states of arousal act in ways that are inconsistent with their intentions and focused on short-term rather than long-term outcomes. Further, these results suggest that, contrary to hypotheses that hot processing leads to changes in cognitive processing, arousal may influence decision making by interfering with the ability to act on one’s intentions. This suggests that, rather than providing input into System 2 processing, System 1 acts simultaneously and potentially in conflict with System 2 and arousal leads to the dominance of System 1. As predicted by theories such as the risk as feelings hypothesis (Loewenstein et al., 2001), this suggests that Systems 1 and 2 act in parallel and that under certain conditions (e.g., risk/conflict, affect, arousal) the two systems may be acting to promote different goals, with System 1’s dominance favoring short-term outcomes to minimize immediate losses or maximize immediate gains (as opposed to focusing on maximizing long-term gains and minimizing long-term losses).

Summary

The review thus far suggests that dual process decision researchers have rarely tackled the issue of sexual decision making and, conversely, researchers studying sexual behavior have yet to utilize and test dual process theories. There are several potential reasons for the lack of applied research that utilizes dual process decision making theories to study the role of affect and arousal on sexual behavior. One possible reason is that studying decision making is incredibly
complex and, as a result, it is done almost entirely through experimental and laboratory-based work. This was evident in the literature on sexual arousal and decision making, where almost all studies were conducted in an experimental framework. New assessment tools may be needed to apply some of the dual process research methods to a non-experimental framework in order to produce research on sexual behavior that retains external validity. Another possibility is that researchers utilizing dual process theories of decision making are concerned more with the decision making process than the behavioral outcome, per se, and that the behavioral outcome studied is typically one of convenience more than importance. However, both aspects of the model (the process and the outcome) are important theoretically and practically, and the utilization of these theories may help to improve the predictive power of existing models of sexual behavior. As such, more research is needed that utilizes a dual process approach to study sexual decision making.
Chapter 4: Individual and Within-Person Differences in Decision Making

Decision making itself is a within-person process that occurs within a specific event in which a choice must be made, though the literature on cognitive styles has long demonstrated that there are also individual—or between-person—differences in the ways in which people execute decision making tasks (Henderson & Nutt, 1980; Hunt, Krzystofiak, Meindl, & Yousry, 1989; Myers, 1987; Phillips, Pazienza, & Ferrin, 1984). Some people may rely more or less heavily on System 1 processing than others and arrive at different decisions based on the same set of available options (i.e., between-person differences). Similarly, that same person may rely more or less heavily on System 1 processing within specific situations to arrive at varying decisions over time and context (i.e., within-person differences). For example, a man who regularly feels lower-than-average levels of sexual arousal compared with other men (i.e., between-person difference) may find himself in a situation in which he is suddenly much more aroused than he typically feels on a given day (i.e., within-person difference). The work by Mischel and colleagues (Metcalfe & Mischel, 1999; Mischel & Shoda, 1995) suggested that certain individual traits (e.g., rejection sensitivity; Downey & Feldman, 1996) might influence the extent to which individuals utilize affective versus cognitive processing. Furthermore, many of the theories reviewed in Chapter 2 (e.g., SCT, TPB, HBM, IMB) relied exclusively on individual differences in trait-like System 2 processes (e.g., self-efficacy, intentions) to predict sexual decision making. Given that decision making can be impacted by individual-level traits or viewed in an aggregated fashion at the individual level while also acknowledging the fact that decisions are momentary, an approach that takes both levels of influence into account might best capture the decision making process.
In contrast to a within-person focus on decision making that takes into account fluctuating processes and situational influences, the SCT-based models of decision making that have been widely used in the sexual behavior literature to date rely primarily on individual-level variables such as attitudes and intentions that are generally presumed to be stable. This methodological approach may be one potential limitation of the existing literature on sexual decision making. For example, the mixed results demonstrated in the Crepaz and Marks (2001) meta-analysis on the utility of affect in predicting sexual risk behavior may have been due to within-person fluctuations in both affect and behavior. To the extent that people are more influenced by how they think or feel in the moment versus how they think or feel in general, they may rely more on momentary fluctuations in affect and cognition. Similarly, to the extent that peoples’ sexual behavior is inconsistent across situations, partners, and time, its fluctuations are likely to be associated with other fluctuating factors such as momentary affect and cognition.

Examining within-person processes by aggregating them to the individual level is known as the ecological fallacy, and has the potential to produce results that may be drastically different from what would be obtained in a non-aggregated, within-person analysis. This results from several factors, one of which is the fact that aggregation relies on modeling averages and ignores within-person variability around those averages. In addition to the fact that SCT-based theories typically rely on aggregated decision making, the existing research on affective processes and sexual behavior has typically been conducted with cross-sectional, aggregated data. In an editorial that followed the publication of the Crepaz and Marks (2001) meta-analysis, Kalichman and Weinhardt (2001) pointed out some additional weaknesses of the literature used for their investigation. For example, the included studies were largely cross-sectional, examined global assessments of affect or conflated affect with mood, and relied on aggregated sexual behavior
data. Overall, much of the research on sexual decision making in general—whether it has included affect or not—has been conducted as an investigation of between-person processes and has largely ignored the role of within-person fluctuations in decision making and behavior.

Not surprisingly, there has long been a call for an approach to psychological theory that accounts for both stable individual differences and fluctuating within-person processes. For example, in their cognitive-affective system theory, Mischel and Shoda (1995) describe a theoretical framework to unify the investigation of dynamics of human behavior at both the individual and the situational level. In this paper, the authors describe a framework for understanding how dispositional traits, environmental stimuli, and affective and cognitive processing interact to produce situational variability in behavior. They suggest that personality differences lead to differences in the perception of situational cues which ultimately leads to changes in affective and cognitive processing that produce behavior. Building on this work, Metcalfe and Mischel (1999) outline environmental characteristics such as acute and chronic stressors that influence cognitive and affective processing that lead “hot” processing to interrupt “cool” processing. These interruptions ultimately lead to situational departures from more long-term, stable intentions and goals. This work provides a framework through which to better understand the interactions of persons and their environments and how this influences decision making.

There has recently been a similar call for an acknowledgement of the role of multiple levels of influence within the literature on sexual behavior. For example, Cooper (2010) describes the ways in which sexual behavior meaningfully differs at both the level of the individual and the level of the sexual situation or event. The author found that there is variability at the individual level that can be attributed to individual differences. However, although she
found that there were predictable individual differences in sexual risk behavior, her work demonstrated that a majority of the variation in behavior existed at the level of the sexual event. Moreover, this intraindividual variation in behavior was predicted by variation in individual traits and situational characteristics. These within-person predictors were stronger predictors of sexual behavior than characteristics of the individual, overall. Cooper ended by echoing the concerns of Mischel and his colleagues—sexual behavior is best understood as an interaction between persons and contexts over time.

Researchers who have utilized an event-level approach to studying sexual behavior have found support for the idea that both between-person and within-person differences have significant associations with event-level sexual behavior (Fortenberry et al., 2005; Grov, Golub, et al., 2010; Mustanski, 2004, 2007; Shrier et al., 2005). For example, Grov et al. (2010) found that daily negative affect reduced the risk of unprotected sex on a given day. On days when men felt higher levels of negative affect, they had lower odds of engaging in unprotected sex than on days when they had lower levels of negative affect. However, the authors also found that this within-person process interacted with individual-level differences in personal attributes. For men who were sexually compulsive, fluctuations in negative affect were less associated with their risk behavior than for men who were not sexually compulsive. While it is important to learn more about the extent to which affect is involved in sexual decision making, it may be significantly more important to better understand for whom and under what circumstances it is most influential. This combination of individual differences and within-person processes highlights the types of questions that a dual process theory such as the CAPS model (Mischel & Shoda, 1995) might be best suited to answer given its acknowledgement of dispositional and situational influences on decision making.
In a recent publication, Frankish (2009) describes the extent to which Systems 1 and 2 operate at different levels in making what he calls a personal-subpersonal distinction. He describes personal events as those which can be ascribed to the individual as a whole. For example, people have beliefs and desires. On the other hand, subpersonal events are those which can be attributed to the state a person’s subsystems rather than the person as a whole. For example, a certain brain area (e.g., the amygdala) may activate a certain process (e.g., fear) that is attributable to that subsystem rather than to the person. In doing so, Frankish sets up a loose dichotomy between dual processes and being trait versus state phenomena. As I mentioned previously, decision making is best viewed as an event-level process given that decisions are, by definition, unique decisional events. Frankish also implies that much of the work of System 2 happens at the personal (i.e., individual) level through the ongoing interaction of past memories, current beliefs and desires, and future goals and intentions. In contrast, much of what happens within System 1 occurs at the subpersonal (i.e., within-person) level as a result of the fact that much of it occurs quickly and momentarily, unconsciously, and in relation to bodily states and biology. As such, dual process theories may be particularly relevant for an investigation of decision making that incorporates elements of both between- and within-person processes to better understand both the consistent and varying aspects of the sexual decisions people make.

Personality or dispositional traits are individual (i.e., between-person) differences that can influence cognitive-affective (i.e., within-person) processing (Mischel & Shoda, 1995). As mentioned previously, one specific type of personality-by-situation interaction that may have an influence on decision making is rejection sensitivity (Downey & Feldman, 1996). The theory posits that, within interpersonal situations, individuals with high levels of rejection sensitivity process environmental cues with high levels of anxious expectation of rejection and makes
attempts to avoid such rejection. The threat of rejection places individuals in a state of stress and negative arousal, thus eliciting System 1 processing to occur without the control or correction by System 2 processing (Ayduk et al., 2000). Indeed, research has demonstrated the relevance of rejection sensitivity for sexual decision making. One study of young women found that those who were high in rejection sensitivity had lower intentions for condom use than those with lower rejection sensitivity when they felt rejected within an experimental sexual vignette (Crabtree, 2012). Another study of Australian young adults, researchers found a significant association between rejection sensitivity and condom use (Edwards & Barber, 2010). Specifically, among participants who wanted to use condoms, those who were high in rejection sensitivity used condoms less often if they perceived that their partner did not want to use condoms. These findings suggest that participants high in rejection sensitivity favored their partners’ condom use preferences over their own, suggesting that fear of rejection or disappointing their partner was more influential over decision making than their own perceived consequences of non-condom use. Taken together, these findings support the role of rejection sensitivity in sexual decision making, though no study to date has examined whether the construct of rejection sensitivity can be directly applied to condom use as the source of rejection rather than examining general processes of rejection sensitivity. The findings bolster the proposition that rejection sensitivity may act to heighten feelings of threat, increase levels of System 1 processing, and shift decision making from focusing on the long-term consequences of non-condom use to short-term, interpersonal consequences of condom use.

Summary

Researchers studying decision making in general and those examining sexual behavior specifically may benefit from considering behavior to be the result of interactions between
individual-level and event-level characteristics. Within the broader field of psychology and
within the literature on sex research, individuals have investigated these phenomena and found
support for the role that both levels of analysis play in shaping human behavior. Although there
is a wide degree of consistency in behavior that can be investigated within an individual
differences paradigm, individuals typically have considerable situational variability in their
behavior that results from adaptations made to specific contexts and environments. The literature
reviewed above suggests that an approach to understanding sexual decision making that takes
into account both within-person and between-person processes may be particularly beneficial.
Dual process theories may be aptly suited to such an investigation, as they occur in parallel and
can be influenced by individual-level traits. An investigation of the extent to which Systems 1
and 2 influence behaviors through individual-level versus within-person processes may provide
new insights into the ways in which sexual decisions are made over time, across contexts, and
both within and between individuals. These processes may be influenced by dispositional traits
such as rejection sensitivity that increase System 1 processing of situational cues and cause
subsequent increases in decisional myopia.
Chapter 5: Overview of the Proposed Research

Throughout the previous chapters, I have reviewed literature that supports the development of a dual process model that examines the role of individual-level characteristics and event-level processing to predict sexual decision making and behavior. The second chapter highlighted the importance of considering affect and arousal in theories of decision making, while the third chapter highlighted the notable lack of such constructs in the major models of sexual decision making. Throughout these two chapters, I discussed several theories and empirical studies that have described the interaction of individual characteristics with event-level processing, and I ended with a fourth chapter focusing on the interacting role of between- and within-person differences in decision making. Taken together, these chapters contain a review of significant literature in the field that allows for the development of testable research hypotheses for a dual process model of sexual decision making.

As discussed in Chapter 2, the affect heuristic suggests that decisions are likely to rely on simple mental associations between the choices and previous emotional associations that are tied with either positive or negative valence (Slovic et al., 2007). As such, affectively-based System 1 processing leads to a mental “shortcut” to arrive more quickly at decisions. This was built upon within Damasio’s (1994) social marker hypothesis, which suggests that the process of decision making occurs vis-à-vis a feedback loop between the body and the brain that requires intact affective processing in order to conduct rational decision making. While giving the same weight to affective processing as the prior two theories, the risk as feelings hypothesis (Loewenstein et al., 2001) suggests that situations of risk and uncertainty can produce conflicts between Systems 1 and 2, leading System 1 to overtake decision-making and potentially produce results that are inconsistent with long-term, deliberative intentions. These theories place a similar emphasis on
the prominent role of affect and arousal (i.e., System 1 processing) for decision making while providing different hypotheses about the exact mechanisms of this influence.

Building upon theories about the prominence of affect for sexual decision making, additional work suggested that internal (i.e., personality) and external (i.e., contextual) influences may alter the relative dominance of affective and cognitive processing during decision making. Incorporating the role of dispositional and personality traits into models of decision making, Mischel and Shoda (1995) proposed that individuals interact with their situations in ways that produce understandable variations in behavior. Personality interacts with features of the environment to produce differential cognitive-affective processing. The activation of these cognitive-affective processing profiles then produces specific routes for decision making that lead to behavior. The theory of rejection sensitivity (Downey & Feldman, 1996) built on the work of Mischel and colleagues to propose one specific type of dispositional trait that can influence decision making in interpersonal situations. Specifically, rejection sensitivity is a disposition that leads individuals to anxiously expect rejection, creating a cascade whereby they potentially misinterpret situational cues and prioritize actions aimed at avoiding potential rejection. Rejection sensitivity is, thus, one such dispositional trait that can lead to decisional myopia through its altering of the perception of situational cues and thus the cascading increase in affective processing and decisional myopia.

Similar to theories regarding the role of personality in biasing decision making, Metcalfe and Mischel (1999) describe their “hot/cool” system of decision making to account for the influence of contextual factors on cognitive-affective processing that can lead to situational variability and inconsistencies between intentions and behavior. Specifically, they note that environmental characteristics such as acute and chronic stress can lead to increases in hot
processing that subsequently interfere with cool, cognitive processing to focus on short-term rather than long-term goals and consequences. These findings suggest that environmental characteristics are likely to account for some of the variation in individual behavior by altering the relative influence of affective and cognitive processing during decision making.

Loewenstein and O’Donoghue (2007) proposed a dual process model of decision making that provided several propositions regarding additional situational characteristics that can lead affective processing to interfere with deliberative processing. The two major features of situational cues—proximity and vividness—lead individuals’ affective processing to increase and, when affective and cognitive processing are motivated to focus on different outcomes, affective processing thwarts deliberative, cognitive processing. Finally, Loewenstein (1996) outlined the significant influence that visceral states such as arousal and affect can have on decision making. His research suggests that states of arousal can undermine the ability to act on one’s intentions in two significant ways. First, individuals are unable to imagine the impact that arousal has on their decision making during times when they are not aroused, and thus overestimate the extent to which they will be able or want to perform a given behavior under states of arousal. As such, their behavioral intentions are likely to be overestimations, to the extent that the behavior is likely to be performed under states of arousal. Second, in addition to intentions being formed while not aroused and thus being overestimated, increasing levels of arousal can lead to increasing discrepancies between intentions and behavior through several means including increases in impulsivity. The work of Loewenstein suggested that proximity and vividness of an outcome and the extent to which a person is experiencing arousal may both lead to an increased focus on maximizing gains and minimizing consequences of short-term rather than long-term outcomes.
Taken together, these theories led me to propose the notion of a decisional myopia that occurs under situations where dispositions and environmental cues increase affective processing and cause conflicts between affect and cognition. Specifically, decision making that occurs under high levels of affective processing is likely to focus on short-term, proximal, and salient outcomes or consequences rather than long-term goals or intentions, leading to decisions that favor the pursuit of affective desires or the escape of affective threats. Additionally, as mentioned previously, dispositional traits can lead to differential profiles of cognitive-affective processing within such situations by means of changing the interpretation of situational cues. Studies on rejection sensitivity have suggested that it may be one such dispositional trait that alters the processing of situational cues, increasing System 1 processing and feelings of threat and subsequently leading to decisional myopia and a focus on short-term consequences of condom use rather than long-term consequences of non-condom use.

**Aims and Hypotheses**

Based on the literature reviewed, the overarching aim of this project is to investigate a dual process model of sexual decision making that examines the notion of decisional myopia and integrates both individual differences (e.g., rejection sensitivity) and within-person processes (e.g., fluctuating situational affect). As such, the project was designed to test several hypotheses which I review below.

**Aim 1.** The first aim of this dissertation is to evaluate a dual process model of sexual decision making. In doing so, it is important not to conflate the effects of trait levels with state levels of these constructs. As such, I will disaggregate the daily measurements of several key constructs into between and within-person effects using established techniques. First, I will examine the contribution of System 1 processing, operationalized as anxious and sexual arousal,
to event-level sexual decision making. Based on the literature I have reviewed suggesting that both affect and arousal can increase sexual risk, I hypothesize the following regarding the main effects of System 1 processes (see Figure 1):

**Hypothesis 1a:** Within-person deviated (i.e., state) anxious arousal will be positively associated with engaging in UAI.

**Hypothesis 1b:** Within-person deviated (i.e., state) sexual arousal will be positively associated with engaging in UAI.

I make no hypotheses about the role of trait or dispositional level arousal given that it was not found to be significantly associated with sexual behavior in research reviewed previously. However, I will adjust for their effects within the models and explore the extent to which they are independently associated with sexual behavior.

Despite relatively consistent findings throughout the literature, it is important to demonstrate the relevance of System 2 processing as well, particularly within the context of a dual process model. As such, I will investigate the role of System 2 processing, operationalized as perceived behavioral control, as a predictor of sexual behavior at both the within-person and between-person levels. Additionally, I will examine the role of individual-level self-efficacy, which shares much in common with perceived behavioral control, in order to examine whether between-person deviated perceived behavioral control and self-efficacy measured at the individual level converge in their predictions. I will test the following hypotheses regarding the main effects of System 2 processes (see Figure 2):

**Hypothesis 2a:** Within-person deviated perceived behavioral control will be negatively associated with engaging in UAI.
Hypothesis 2b: Between-person deviated perceived behavioral control will be negatively associated with engaging in UAI.

Hypothesis 2c: Individual-level self-efficacy will be negatively associated with engaging in UAI.

The hallmark of a dual process theory is the simultaneous operation of Systems 1 and 2. The literature reviewed suggests that increases in state levels of sexual arousal are associated with increased risk, but also that this increase occurs through an interaction with System 2 processing. As depicted in Figure 3, I hypothesize that:

Hypothesis 3: There will be a significant interaction between within-person deviated sexual arousal and within-person deviated perceived behavioral control, such that the previously hypothesized negative association between perceived behavioral control and UAI will be attenuated by sexual arousal.

This interaction would provide support for the notion that System 1 processing is able to interrupt System 2 processing during times of arousal, as described in the risk as feelings hypothesis. An alternative hypothesis presented in the literature is that System 1 processing feeds into System 2 processing, causing changes in the way System 2 conducts traditional cost-benefit analyses as described in the somatic marker hypothesis. As such, I will test for evidence of a mediational association between the two along with this hypothesis to explore this alternative. In doing so, I will examine the extent to which higher levels of arousal decrease one’s perceptions of behavioral control, thus indirectly leading to increases in the odds of UAI.

Aim 2. The second aim of this dissertation is to demonstrate the relevance of rejection sensitivity (RS) as a dispositional trait influencing sexual decision making. I will do this using a newly developed scale measuring the extent to which individuals fear rejection from partners if
they insist on using condoms (i.e., condom-related rejection sensitivity). In addition to psychometric analysis in which I will present preliminary validation of the measure, I hypothesize a direct effect of RS on condom use:

_Hypothesis 4:_ Rejection sensitivity will be positively associated with engaging in UAI.

In order for rejection sensitivity to act upon sexual decision making, it should meet certain criteria based on the previously reviewed literature. First, RS should lead individuals to anxiously expect rejection and increase affective processing as the threat of rejection increases. As pictured in Figure 4, I hypothesize the following:

_Hypothesis 5a:_ Condom-related RS will be associated with increases in daily anxious arousal

_Hypothesis 5b:_ The increased levels of daily anxious arousal for men higher in rejection sensitivity will be moderated by whether or not the participant engaged in anal sex with a casual male partner that day, such that men who are high in condom-related rejection sensitivity will experience more anxiety on days when they must make decisions regarding condom use (i.e., sex days).

Specifically, hypothesis 5b suggests that anxiety occurs at least partially as a result of being in a sexual environment. However, the key component of the hypothesis is that this effect is most pronounced (or perhaps only exists) for individuals high in condom-related RS. This hypothesis will provide support for the notion that RS creates the conditions for increased affective processing which ultimately leads to decisional myopia.

In addition to creating increased affective processing, I will examine mechanisms of the association between condom-related rejection sensitivity and UAI. I will begin by investigating whether rejection sensitivity is able to act upon UAI by creating a situation in which attention is
shifted from long-term health behaviors to short-term rejection avoidance. Specifically, I will examine whether rejection sensitivity leads people to focus less on safer sex and more on rejection avoidance by testing the following:

*Hypothesis 6:* Individual-level self-efficacy and condom-related RS will interact to predict UAI such that the negative association between self-efficacy and UAI will be attenuated for individuals with higher levels of condom-related RS (see Figure 5).

This hypothesis provides the next step from hypothesis 5b—having established that RS is associated with increased affect and thus, affective processing, hypothesis 6 would provide support for the idea that individuals can hold competing goals. Under such conditions, it is plausible that individuals could have long-term goals (i.e., condom use to prevent HIV) that are in conflict with short-term goals (i.e., UAI to prevent rejection). This finding would provide evidence of the necessary criteria for decisional myopia to occur. Specifically, it would suggest that individuals with conflicting levels of condom-related RS and self-efficacy may have competing goals with regards to condom use (i.e., short-term goals to prevent rejection and long-term goals to prevent HIV infection).

The final step will be to demonstrate the existence of cognitive myopia itself. To do so, I will test the following hypotheses depicted in Figure 6:

*Hypothesis 7a:* RS will significantly increase the association between within-person deviated anxious arousal and increased engagement in UAI.

*Hypothesis 7b:* RS will significantly increase the association between within-person deviated sexual arousal and increased engagement in UAI.

These hypotheses would provide support for the notion of decisional myopia by demonstrating that the association between affect/arousal and risk is at least partially attributable to RS. This
would suggest that individuals have shifted focus from a distal consequence (i.e., HIV infection) to proximal and salient consequence (i.e., rejection).
Chapter 6: Method

Data for this dissertation were collected with support from a fellowship from the National Institute of Mental Health (F31-MH095622) which had as its aims both secondary data analysis and the collection and analysis of data specifically for this dissertation. Secondary data analyses were conducted from data collected as part of an existing study (i.e., the ‘parent project’), The Pillow Talk Project (R01-MH087714; PI: Parsons), a study of highly sexually active gay and bisexual men in New York City. Data for the parent project and those specific to this dissertation were collected as part of a single CASI survey prior to participants’ follow-up visits. Specifically, this dissertation project focuses on data collected from an at-home CASI completed prior to the parent project’s 12-month follow-up appointment as well as a 30-day online daily diary conducted immediately following the 12-month appointment. Follow-up completion for the parent project is currently ongoing and analyses were focused on a subsample of 207 men who have completed the necessary components of the study to date, as I describe below.

Participants and Procedures

All participants in this study provided informed consent to participate in the parent project at their baseline appointment and renewed their informed consent during the 12-month appointment. Prior to the 12-month visit, participants were entered into a secure mailing list using the Qualtrics survey software and a survey was programmed to be distributed to them shortly before the date of their scheduled follow-up appointment. Following completion of their 12-month visit, participants were then asked to complete an online daily diary for the 30 days. Participants were compensated $60 for their full completion of the 12 month visit and could earn up to $60 for completing all 30 days of the online diary ($1 per day with a $5 bonus for every 5
days completed). All procedures were reviewed and approved by the Office of Research Protections of the City University of New York.

**Relevant procedures from the parent project.** From February of 2011 until June of 2013, participants were enrolled into the parent project using a combination of recruitment strategies, including: respondent-driven sampling (RDS); internet-based advertisements on social networking (e.g., Facebook), community forum (e.g., Craigslist), and sexual networking (e.g., Manhunt, Adam4Adam) websites; mobile phone-based advertisements on sexual networking (e.g., Grindr) applications; email advertisements through New York City sex party listservs; and active recruitment in New York City venues such as gay bars and clubs as well as sex parties. Preliminary eligibility was ascertained for each participant by completing a brief, phone-based interview with a member of the research staff to confirm the participant met the following inclusion criteria: (1) was at least 18 years of age; (2) was biologically male and self-identified as male; (3) had at least nine unique male sexual partners in the prior 90 days, with at least two of those in the prior 30 days; (4) self-identified as gay, bisexual, or another non-heterosexual identity (e.g., queer); and (5) had daily access to the internet in order to complete several internet-based assessments and the daily diary studies. The study operationalized highly sexually active as having at least 9 sexual partners in the 90 days prior to enrollment, with at least 2 of these partners being within the prior 30 days. These cutoffs were based off of prior research (Grov, Parsons, & Bimbi, 2010; Parsons, Bimbi, & Halkitis, 2001; Parsons et al., 2008), including a probability-based sample of urban MSM (Stall et al., 2003; Stall et al., 2001) that found that 9 partners was more than 2 to 3 times the average number of sexual partners among sexually active gay and bisexual men. All inclusion criteria were confirmed during participants’ initial parent project study visits.
Participants who met all inclusion criteria were nonetheless considered ineligible if they met any of the following exclusion criteria: (1) being unable to complete all aspects of the study design in English; (2) demonstrating evidence of serious cognitive or psychiatric impairment that would interfere with their participation or limit their ability to provide informed consent; or (3) receiving an HIV-positive diagnosis during HIV testing procedures at baseline (conducted only for participants who self-report being HIV-negative; HIV-positive participants with a confirmed diagnosis are eligible for the project). The exclusion of those who tested HIV-positive was for a six month period only and was designed to allow for their facilitation into care, after which they were free to enroll into the study.

The parent project consisted of two baseline appointments within one month of each other, a 6 month follow-up, an optional 9 month follow-up CASI online, and a 12 month follow-up which had both at-home (internet-based) procedures as well as in-office procedures. For the first 30 days following the first baseline appointment and the 12 month follow-up visit, participants also completed an online daily diary. Participants completed online CASI surveys from their home prior to each visit and the baseline and 12-month CASIs each contained informed consent procedures. Informed consent for the full project was obtained at the beginning of the baseline appointments and again at their 12-month visits as per the protocols of the CUNY-wide IRB.

Measures

Measures for this dissertation were collected from two sources—an online CASI conducted from home prior to the parent project’s 12-month follow-up assessment (including measures specific to this dissertation study) and an online 30-day daily diary completed after the 12-month assessment, both of which were required for participation in the parent project. Those
measures collected as part of the online daily diary were considered to be within-person measures as a result of their repeated measurement over time, while those collected as part of the 12-month CASI prior to their visit were considered to be between-person measures as a result of their one-time measurement.

**Within-person measures from the daily diary.** Participants completed several measures as a part of their online daily diaries that they complete for the 30 days following their 12 month follow-up visit. Each day, participants received a unique link to complete their online diary at 8pm, and the link expired if it had not been completed by 10am the following morning. The survey began with an assessment of their affect over the course of the day, followed by information about substance use (not included for this dissertation), and finally an assessment of sexual behavior. The section on sexual behavior began by asking whether or not they had any sexual contact for the day and, if so, with whom. For those who reported a main partner, participants were asked separately about behavior with that partner (analyses for this dissertation did not focus on behaviors with a main partner). For each casual partner (defined simply as a non-main partner) for the day, participants were asked a series of questions about characteristics of the partner and the types of behavior in which they had engaged with that partner. If participants had more than four casual partners in a given day, the first four were asked in detail and the remaining partners were asked about within a combined summary to reduce burden. Below I describe the primary variables from the diary that were used in analyses. Based on my review of the literature, I chose to utilize measures of anxious affect and sexual arousal as System 1 variables and perceived behavioral control as a System 2 variable.

**Sexual behavior.** The hypotheses for this dissertation utilized two different sexual behaviors: any anal sex with a casual partner on a given day as a predictor (hypotheses 5a and
5b) and any UAI with a casual partner on a given day as an outcome (all others). All analyses focused on casual rather than main partners as the process of sexual decision making for main partners is likely to differ from that with casual partners. For analyses focused on whether or not a participant engaged in anal sex with a casual male partner, I recoded questions which asked whether or not the participant had engaged in receptive or insertive anal sex with each casual partner for that day into a single indicator of having at least one anal sex act versus having none (any anal sex = 1, no anal sex = 0). The primary outcome of most analyses was whether or not participants engaged in UAI on a given day with a casual male partner. For the purposes of this dissertation, UAI was defined as any anal intercourse without a condom that occurred with a casual (i.e., non-main) sexual partner of any HIV status. As mentioned previously, behavior was measured each day on a partner-by-partner basis, with participants being asked to indicate whether they had receptive and insertive anal intercourse with, without, or both with and without condoms with each partner on that day. Because event-level predictor variables were measured at the level of the day rather than each sexual partner or event, sexual behavior was recoded into a day-level, three-category (i.e., trichotomous) indicator of UAI. Participants who reported having either receptive or insertive anal sex without a condom at least once with at least one casual partner on a given day were coded as yes for that day, which was assigned a value of 2. Those who reported having sexual activity with a casual partner but had no anal sex or had anal sex but only with condoms were coded as a 1 for analyses and served as the comparison group throughout analyses. Those who reported no sexual activity with a casual partner on a given day were assigned a value of 0 and, though included in all analyses (utilizing multinomial logistic regression), comparisons between this group and the others will not be reported.
**Affect and arousal.** Anxious affect and sexual arousal were measured using an adaptation of the Positive and Negative Affect Schedule (PANAS; D. Watson, Clark, & Tellegen, 1988) and the Mood and Anxiety Symptom Questionnaire (MASQ; D. Watson & Clark, 1991) that have been previously used by Mustanski and colleagues (Grov, Golub, et al., 2010; Mustanski, 2007) in daily diary research on gay and bisexual men. Participants were asked to, “Indicate to what extent you have felt each of the following ways today” on a scale ranging from 1 (very slightly or not at all) to 4 (extremely). In addition to items measuring positive and negative affect that will not be utilized for this dissertation, the scale contained items measuring the domains of anxious arousal (e.g., “jittery,” “scared,” and “nervous”) and sexual arousal (e.g., “sexually interested,” “sexually aroused,” and “horny”). Scale scores were created by averaging across the items for each subscale following a factor analysis which will be described in a forthcoming section. Additional information regarding the centering of each scale and the partitioning of variance to the within- and between-person levels is provided at the end of this chapter.

**Perceived behavioral control.** In order to assess perceived behavioral control on a daily basis, participants were asked to respond to the question “how much control did you feel over your sexual behavior today?” with responses ranging from 0 (not at all) to 3 (very in control).

**Between-person measures from the at-home CASI.** Participants completed several measures as part of the online CASI prior to their 12 month follow-up visits that tapped into individual differences in several key variables. For the purposes of this dissertation, I focused on the role of a newly developed scale, condom-related rejection sensitivity, as well as the role of safer sex self-efficacy as individual-level (i.e., between-person) variables.
**Condom-based rejection sensitivity.** Following the format of rejection sensitivity as typically measured in the Adult Rejection Sensitivity Questionnaire (RSQ; Downey & Feldman, 1996) and others (Pachankis, Goldfried, & Ramrattan, 2008), I developed a scale to examine rejection sensitivity specifically within the context of decisions about condom use. Based on the results of a qualitative pilot study with 23 HIV-positive adults in New York City, I generated a list of seven scenarios in which a decision must be made regarding whether or not to use a condom in which there might be a high likelihood that the partner would be rejecting or the participant might be worried about rejection if he chooses to use a condom. The content of each item and its response options can be found in the Appendix. Participants responded to items about anxiety (e.g., “How concerned/anxious would you be that he would not want to have sex with you if you insisted on using a condom?”) and likelihood (e.g., “How likely is it that he would not want to continue dating you if you insisted on using a condom?”) on a scale ranging from 1 (very unconcerned or very unlikely) to 6 (very concerned or very likely). Consistent with the RS paradigm, the anxiety and likelihood items were multiplied within each situation and then averaged across situations to form a total score. Additional information regarding psychometrics of the scale is presented within Chapter 7.

**Safer sex self-efficacy.** Participants’ sense of control over and skill regarding their condom use was measured using the 13-item Safer Sex Self-Efficacy Questionnaire (SSSEQ; Parsons, Halkitis, Bimbi, & Borkowski, 2000; Wells, Golub, & Parsons, 2011). Participants were asked “How confident are you that you could avoid having anal sex without a condom...” across a variety of different sexual situations (e.g., “when you really want sex?” and “when you are drunk or high on drugs?”). Responses range on a Likert-type scale from 1 (not at all confident) to
5 (extremely confident) and were summed to form an overall score ranging from 13 to 65 with strong reliability (α = 0.97).

Data Analysis Plan

Data analyses occurred in several phases. First, I conducted preliminary descriptive analyses of the sample, including demographic characteristics, retention from the parent project through to the present analytic sample, and information regarding daily diary reactivity and confounding variables. Next, I conducted psychometric investigations of the measure of anxious and sexual arousal as well as the newly created measure of condom-related rejection sensitivity to ensure that the versions used within later analyses adequately meet statistical assumptions such as unidimensionality. Finally, I iteratively conducted a series of multilevel models to test the hypotheses of this dissertation.

Descriptive statistics. I began by examining the demographic properties of the sample using basic descriptive statistics. I next conducted basic descriptive statistics to describe the flow of participants from their initial baseline appointments in the parent project into the analytic sample for this dissertation. In a final set of analyses, I conducted basic multilevel models to characterize the extent to which reactivity (i.e., changing behavior over time) to the diary was evident (i.e., by examining whether the odds of UAI changed as a function of time) as well as examining demographic confounding variables (i.e., by examining the extent to which demographic characteristics of the sample were significantly associated with the odds of UAI in a multilevel model). The first step was specifying a model in which the only predictor was a level-1 (i.e., within-person) indicator for time (i.e., day 0 through 30, centered at day 15). After examining whether the outcome changed as a function of diary day, I also entered a quadratic and then a cubic term to examine the possibility of a nonlinear association between time and the
odds of UAI. In the case of non-significant findings, I recoded time into additional variables that may better account for any of time such as day of week (i.e., a categorical indicator from 1 to 7), or whether or not it was a weekend. Were time found to be significant, it would be retained in all further models to adjust for its confounding effect. A similar strategy was utilized for demographic confounders, whereby demographic characteristics were simultaneously entered and examined for significant associations with UAI.

**Psychometric investigations.** I began by conducting a multilevel confirmatory factor analysis following the technique described by Bryne (2012). Specifically, I utilized Mplus software version 7.2 to conduct a two-level confirmatory factor analysis of the full, modified PANAS scale used within the online daily diary. I examined model fit, parameters, and modification indices and, based on these, made modifications to the scale to improve its structure prior to use in analysis. I next conducted a confirmatory factor analysis of the newly created condom-related rejection sensitivity scale to ensure that it was a unidimensional construct. Specifically, I entered all seven items into a standard confirmatory factor analysis in Mplus version 7.2

**Multilevel modeling.** Multilevel modeling occurred in an iterative fashion as suggested by Raudenbush and Bryk (2002). As mentioned previously, I examined the role of time and demographic variables as confounding variables prior to proceeding with the full analyses. Following these steps, I began by testing the hypotheses using the appropriate modeling technique for each. Within each model, I utilized a random intercept with an unstructured covariance matrix. In order to utilize all available data, all models with UAI as an outcome were conducted by using the trichotomous sexual behavior indicator (i.e., no sex, sex but no UAI, UAI) within a multilevel, multinomial logistic model, though only comparisons of the second
and third categories (sex but no UAI, UAI) will be discussed throughout. Those models in which anxious arousal is the outcome (i.e., hypotheses 5a and 5b) were conducted utilizing multilevel linear modeling. Throughout all models, within-person continuous variables (i.e., anxious arousal, sexual arousal, perceived behavioral control) were centered and underwent a technique to decompose the variance into both within-person and between-person components (see section below on centering and variance decomposition for further details). All models with such a within-person component were adjusted for the impact of the between-person component of the same variable whether or not the between-person component was included within the hypothesis. All multilevel models for the testing of hypotheses were conducted using the generalized mixed modeling feature of SPSS version 20.

_Hypotheses 1a and 1b._ The first set of hypotheses focused on the direct influence of within-person deviated (i.e., state) anxious and sexual arousal on the outcome of UAI. I conducted two multilevel models, one to test each hypothesis, with the trichotomous outcome the type of sexual behavior a participant engaged in on that day. Specifically, within-person and between-person deviated anxious arousal were entered as fixed effects in the first model whereas within-person and between-person deviated sexual arousal were entered as fixed effects in the second model.

_Hypotheses 2a, 2b, and 2c._ The second set of hypotheses focused on the role of within-person (i.e., state) and between-person (i.e., trait) deviated perceived behavioral control and between-person self-efficacy for condom use in predicting UAI. I conducted two multilevel models, one to test the first two hypotheses and a second model to test the third hypothesis, with the trichotomous outcome of type of sex the participant engaged in that day. Specifically, the first model contained within-person and between-person deviated perceived behavioral control as
fixed effects, while the second model contained both of these variables as well as individual-level safer sex self-efficacy as a between-person fixed effect.

**Hypothesis 3.** The third hypothesis focused on the interaction between within-person deviated (i.e., state) levels of sexual arousal and perceived behavioral control on predicting UAI. As the main effects of each of these variables had already been examined within previous analyses, I conducted one model in which the main effects and an interaction term were entered simultaneously to examine their relative impact on predicting UAI. As with prior analyses, I utilized a trichotomous outcome of the type of sex in which a participant engaged on that day. To test the alternative hypothesis that System 2 processes (i.e., perceived behavioral control) mediate the association between System 1 (i.e., sexual arousal) and UAI, I utilized Mplus version 7.2 to conduct a multilevel path model testing for this possibility.

**Hypothesis 4.** The fourth hypothesis focused on the role of individual-level condom-related rejection sensitivity in predicting UAI. I conducted one multilevel model with the trichotomous outcome. The model did not include any variables at level 1 other than the random intercept.

**Hypotheses 5a and 5b.** The fifth set of hypotheses focused on the role of condom-related rejection sensitivity in levels of anxious arousal on a given day and, in the second model, on days when a participant must make a decision regarding condom use (i.e., anal sex days). I conducted two multilevel linear models. In the first model, I predicted daily levels of anxious arousal with condom-related rejection sensitivity as a level 2 predictor with no level 1 (i.e., within-person) predictors other than the random intercept. The second model again focused on the direct effect of condom-related rejection sensitivity in predicting daily levels of anxious arousal but also
included a main effect of whether or not the participant engaged in anal sex with a casual partner that day as well as an interaction between rejection sensitivity and engagement in anal sex.

**Hypothesis 6.** In the sixth hypothesis I proposed that individual-level rejection sensitivity and self-efficacy would interact to predict UAI, such that rejection sensitivity would diminish the impact of self-efficacy in reducing the odds of UAI. As such, I entered the main effect of each as well as an interaction term between these between-person variables simultaneously to examine the significance of each. The only within-person variable within this model was the random intercept.

**Hypotheses 7a and 7b.** The final set of hypotheses focused on the role of within-person deviated levels of anxious and sexual arousal in moderating the association between individual-level (i.e., between-person) rejection sensitivity and engaging in UAI. I conduct two models, each testing one form of arousal (i.e., anxious or sexual) in predicting the trichotomous outcome of the type of sex a participant engaged in on that day.

**A note on variable centering and variance decomposition.** I was explicitly interested in examining both within-person processes and between-person differences, as this approach has been applied infrequently in the literature to date (see Molenaar & Campbell, 2009 for a discussion of this issue as well as Bolger, Davis, & Rafaeli, 2003). I followed guidelines proposed by Bolger and Laurenceau (2012) and Curran and Bauer (2011) to disaggregate the daily measurement of affect into its between- and within-person components. This involved a four step centering procedure: (1) the grand mean of the variable was calculated; (2) each individual’s mean for the variable was calculated; (3) each individual’s mean for the variable was subtracted from his daily measurement to create an individual-centered level of affect for each day; and (4) the grand mean was subtracted from the individual average to create a grand
mean-centered, between-person level measurement of affect. These two deviated scores are considered to be relatively independent of each other and the between-person value can be used as a level 2 predictor while the within-person value can be used as a level 1 predictor. The between-person predictor indicates people who are generally more or less prone to a variable (e.g., more prone to anxious arousal) than the average person in the dataset, while the within-person predictor indicates within-person fluctuations within days on which people are experiencing more or less positive and negative affect than their average day (e.g., a day on which he is more anxiously aroused than usual). All other level 2 variables (i.e., condom-related rejection sensitivity, safer sex self-efficacy) were turned into z-scores which achieved the benefit of centering them at the grand mean as well as easing interpretability by putting them on comparable scales (effects for which can be interpreted as the change in the odds of UAI for a one standard deviation increase in the given predictor).
Chapter 7: Descriptive Statistics and Psychometrics

In the following chapter, I begin by describing the demographic characteristics of the analytic sample. I next provide details on how the analytic sample differs from the full study sample as a whole, particularly as a result of retention in the project. Following these sections, I provide information regarding the daily diary data, specifically focusing on completion rates, an examination of reactivity, and confounding factors associated with engagement in UAI. Finally, I end with psychometric analyses of the daily diary measures of anxious and sexual arousal and the one-time CASI measure of condom-related rejection sensitivity.

Demographic Characteristics

Table 1 presents the demographic characteristics of the sample of 207 men included in these analyses. As can be seen in the table, the sample was highly diverse with regards to race/ethnicity, with more than half being men of color. The sample was nearly evenly split between HIV-positive and HIV-negative men, with a slightly higher proportion of HIV-negative men. A large majority of the sample was gay-identified as opposed to bisexual, and the sample was relatively evenly split between currently being employed full-time or part-time or being unemployed. A large majority of participants had at least some experience with post-secondary education, and nearly one-quarter had some form of graduate-level education. Approximately one-third of the men in the sample reported being in a relationship.

Study Enrollment

The model in Figure 7 displays the flow of participation from enrollment in the parent project to inclusion in the analytic sample for this dissertation. As can be seen in the figure, a total of 377 participants enrolled into the parent project. Of those, at the point at which data were analyzed for this dissertation, 70 participants had not yet reached their 12-month window and
thus had not returned for follow-up, and an additional 70 missed their opportunity to complete the 12-month follow-up. The remaining 238 participants all completed the 12-month follow-up and were thus eligible for inclusion in this dissertation study. However, due to technical errors, seven of these participants had incomplete pre-12-month CASIs and were unable to complete necessary measures (e.g., condom-related rejection sensitivity, safer sex self-efficacy). An additional 24 participants opted not to participate in the 30-day diary cycle following the 12-month appointment, and thus were unable to be included in analyses. As such, the final analytic sample for this study is 207 highly sexually active gay and bisexual men who remained enrolled in the parent project for the course of one year.

**Diary Information**

Of the 207 men included in this study, 14 were only partially finished with their 30-day diary cycle at the time of analyses and, while included in analyses, are excluded from retention calculations. Among the 193 participants who had the full opportunity to complete the 30-day diary cycle, the average number of diary days per participant was 22.3 (74.3% average completion) and the median was 26.0 (86.7% median completion). Figure 8 displays a histogram which visually represents the number of days completed by participants. As can be seen, a majority of participants completed a substantial portion of the 30-day cycle, though a minority of participants completed very few days and thus skewed the average number of days towards the middle range.

The next step was to examine potential behavioral reactivity to the daily diary whereby the odds of UAI may change over the course of time. To do so, I fit a multilevel model with diary day (i.e., 1 through 30) centered at 15 (i.e., 15 = 0) as the only predictor of UAI in the model. Diary day was not associated with engaging in UAI with a casual partner (AOR = 1.00,
95%CI[1.00, 1.00], \( p = 0.85 \). I examined the potential for nonlinear (i.e., quadratic, cubic) effects of time on the odds of UAI and similarly found non-significant associations. I next examined whether day of week, coded as dichotomous indicators of each day, was associated with engagement in UAI. I conducted one model in which Sunday served as the referent and another in which Monday served as the referent and found, across both models, only one significant difference between Monday and Saturday (AOR = 0.54, 95%CI[0.33, 0.88], \( p < 0.05 \)), suggesting that UAI was less common on Saturdays than Mondays. As a result of this finding, I examined whether grouping weekend days together (i.e., Friday, Saturday, and Sunday) might influence the odds of UAI. Although weekends had a higher odds of sex in general, there was not a significant association between weekends and engagement in UAI (AOR = 0.94, 95%CI[0.73, 1.21], \( p = 0.62 \)). As such, no further models were adjusted for the effect of time or day.

I next examined the influence of demographic variables on daily odds of engaging in UAI. Specifically, I examined the role of race/ethnicity (white = 1, non-white = 0), HIV status (positive = 1, negative = 0), sexual orientation (gay/queer = 1, bisexual = 0), and relationship status (partnered = 1, single = 0). HIV-positive status (AOR = 4.81, 95%CI[2.99, 7.74], \( p < 0.001 \)) was significantly associated with increased odds of UAI with casual partners and being partnered (AOR = 0.51, 95%CI[0.32, 0.81], \( p < .01 \)) was significantly associated with decreased odds of UAI with a casual partner, while all others were non-significant. As such, all further models were adjusted for the impact of HIV status and relationship status.

Measurement of Arousal

In order to disaggregate the daily measurements of anxious and sexual arousal into their within-person (i.e., fluctuating) and between-person (i.e., dispositional) components, it is
important to begin by confirming that the scale maintains the same structure at both levels (Bryne, 2012). That is, it is important to confirm that anxious and sexual arousal are structurally equivalent (i.e., can be measured in the same way) at both the within- and between-person levels. Following guidelines by Byrne, I conducted multilevel confirmatory factor analysis in order to confirm that the variance could be adequately partitioned to each level utilizing the same structure, which would suggest that the same items could then be utilized to calculate both the within-person and between-person scores.

Specifically, I fit a two-level, four-factor (i.e., four factors per level) multilevel model to the data. Although the analyses for this dissertation focus exclusively on anxious and sexual arousal, the full scale (which includes items for positive and negative arousal, as well) was retained in the factor analyses. In doing so, I consulted modification indices to suggest potential modifications to the model that might improve its fit. To maintain relevance to the present study, I report exclusively on the results of the analyses that are relevant to the anxious and sexual arousal subscales. The five items corresponding to anxious arousal (jittery, scared, afraid, anxious, and nervous) and sexual arousal (sexually interested, sexually aroused, horny) were set to load onto those factors in the original model, as displayed in Figure 9. Intraclass correlation coefficients for each item, which indicate the proportion of the variance due to between-person variation, ranged from 0.33 for the “sexually aroused” item to 0.53 for the “jittery” item, suggesting that at least half of the variance resulted from fluctuations within individuals and it was necessary to take into account the multilevel structure of the data.

The initial model suggested that there was strong residual correlation between items 4 and 5 (“scared” and “afraid”), and thus item 4 was removed from the model. Modification indices also suggested that the “stressed” item loaded meaningfully onto the anxious arousal
subscale, which is also conceptually meaningful, and thus this item was added to the anxious arousal subscale at both levels. Finally, analyses revealed that the “jittery” item fit the anxious arousal subscale poorly with a factor loading less than 0.50 at the within-person level, and as such this item was removed. All three of the original sexual arousal items were retained for that subscale. All fit indices for the final model structure shown in Figure 10, with the exception of the chi-square statistic (which is known to be sensitive to large sample sizes; χ²(226) = 1118.94, p < 0.001), demonstrated evidence of strong fit (RMSEA = 0.03, CFI = 0.95, TLI = 0.94, SRMRWithin = 0.04, SRMRBetween = 0.05). All further analyses relied on the modified composition of the anxious arousal subscale and the original composition of the sexual arousal subscale.

**Measurement of Condom-Related Rejection Sensitivity**

Prior to using the newly developed condom-related rejection sensitivity scale, I conducted a series of psychometric analyses to ensure its structure and reliability were appropriate for analysis. I began by conducting a confirmatory factor analysis using the combined anxiety-likelihood scores (i.e., the product of the anxiety and likelihood responses for each item) for all seven items. As can be seen in Table 2, the initial model showed evidence of misfit (i.e., the chi-square p-value was less than 0.05, the RMSEA was greater than 0.06, and the CFI and TLI were less than 0.95). Although each factor loading was above typical thresholds, three items stood out as being a poorer fit than the others based on both factor loadings and the R² explained by the model. Examining the item content, these were the only three items that explicitly mentioned an overt discussion of non-condom use within the vignette (in contrast to the participant’s perceptions regarding his partner’s desire for condom use), perhaps leading to meaningfully different patterns of response than the other items. Indeed, removing these three items from the scale substantially improved model fit, with all indices exceeding the standards
for good model fit (i.e., non-significant chi-square $p$-value, RMSEA less than 0.06, CFI and TLI greater than 0.95, and SRMR less than 0.06). The four retained items formed a scale that had a Cronbach’s alpha of 0.91. Averaging the four anxiety-likelihood product scores together from the four vignettes, the average score was 27.4 ($SD = 26.7$). The score obtained from the four items from the final model are utilized throughout all further analyses.
Chapter 8: Results of the First Aim

The first aim of this dissertation was to investigate a series of hypotheses regarding the role of anxious and sexual arousal, behavioral control, and self-efficacy on the daily use of condoms during anal sex with casual male partners. These hypotheses were developed to advance a dual process model of sexual decision making that incorporated both the role of System 1 (i.e., affect and arousal) and System 2 (i.e., behavioral control and self-efficacy) processing. Furthermore, the hypotheses included the impact of both fluctuating, situational (i.e., within-person) processes and dispositional (i.e., between-person) traits. As mentioned previously, all models were adjusted for the impact of HIV-positive status and relationship status, which were significantly associated with engagement in UAI, and results are presented only for comparisons between sex days without UAI and those with UAI, leaving out the comparisons for days on which there was no sexual activity (although these were included in the models).

Hypotheses 1a and 1b

Table 3 displays the results of analyses for Hypothesis 1a, in which I proposed that within-person fluctuations in anxious arousal would be positively associated with engagement in UAI, holding constant men’s dispositional tendencies towards anxious arousal. As can be seen, neither within-person fluctuations in anxious arousal (AOR = 0.87, \(ns\)) nor dispositional tendencies towards higher levels of anxious arousal (AOR = 1.39, \(ns\)) were significantly associated with UAI.

Table 3 also displays the results of analyses for Hypothesis 1b, in which I proposed that within-person fluctuations in sexual arousal would be positively associated with engagement in UAI, holding constant men’s dispositional tendencies towards sexual arousal. As can be seen,
within-person fluctuations in sexual arousal (AOR = 1.26, \(p = 0.03\)) were positively associated with engagement in UAI, such that a one-unit increase in sexual arousal was associated with a 26% increase in the odds of UAI on a given day. Individual-level tendencies towards sexual arousal (AOR = 1.11, \(ns\)) were unassociated with engagement in UAI.

**Hypotheses 2a, 2b and 2c**

Table 4 displays the results for Hypotheses 2a and 2b, in which I proposed that within-person fluctuations in and individual-level dispositions toward a sense of control over sexual behavior would be negatively associated with engagement in UAI. As can be seen, within-person fluctuations in perceived behavioral control (AOR = 0.69, \(p = 0.001\)) were negatively associated with engagement in UAI, such that a one-unit increase in behavioral control was associated with a 31% decrease in the odds of UAI on a given day. However, contrary to Hypothesis 2b, individual-level tendencies towards higher levels of behavioral control (AOR = 0.98, \(ns\)) were unassociated with engagement in UAI.

Table 4 also displays the results for Hypothesis 2c, in which I proposed that individual-level disposition towards higher levels of safer sex self-efficacy would be negatively associated with engaging in UAI. As can be seen, when added to a model with the effects for within- and between-person deviated perceived behavioral control, individual-level safer sex self-efficacy (AOR = 0.53, \(p < 0.001\)) was negatively associated with engagement in UAI, such that a man who was one standard deviation higher in self-efficacy than the average man in the sample had 47% lower odds of engaging in UAI on a given day. The addition of individual-level self-efficacy to the model also slightly reduced the impact of within-person fluctuations in perceived behavioral control (AOR = 0.73, \(p = 0.004\)) on engagement in UAI.

**Hypothesis 3**
The final hypothesis for the first aim was that within-person fluctuations in sexual arousal and perceived behavioral control would interact to predict UAI, such that the negative association between perceived behavioral control and UAI would be diminished by higher levels of sexual arousal. As can be seen in Table 5, I found no evidence for an interaction between within-person fluctuations in sexual arousal and perceived behavioral control (AOR = 0.99, ns) and the main effect of within-person sexual arousal (AOR = 1.20, p = 0.11) on UAI was also diminished to marginal significance (from the initial value that can be found in the result for Hypothesis 1b in Table 3). Within-person perceived behavioral control (AOR = 0.66, p = 0.001) was the only variable to maintain a significant and negative effect on UAI even after adjusting for the impact of sexual arousal. Given that previous models have suggested that System 2 (i.e., perceived behavioral control) might mediate the association between System 1 (i.e., sexual arousal) and UAI and given the reduction in the effect of sexual arousal on UAI when entered simultaneously with perceived behavioral control, I next examined evidence for a mediational pathway from sexual arousal to UAI through perceived behavioral control. Multilevel path analyses revealed a significant negative effect of sexual arousal on perceived behavioral control (B = -0.20, p < 0.001). Utilizing a model constraint whereby the indirect effect of sexual arousal on UAI was fixed to zero, I found that this null hypothesis was rejected, suggesting a significant, positive indirect effect of sexual arousal on UAI through perceived behavioral control, $\chi^2(1) = 10.81, p = 0.001$. These findings suggest that increases in sexual arousal lead to subsequent decreases in perceived behavioral control which, in turn, lead to increases in the odds of UAI.

**Aim 1 Discussion**

The first aim of this dissertation was to investigate a dual process model of sexual decision making in which the roles of anxious and sexual arousal were added to existing System
2 components of commonly used models of sexual risk behavior such as safer sex self-efficacy and perceived behavioral control. Taken together, these findings partially supported the inclusion of System 1 variables in conceptualizations of sexual decision making for highly sexually active gay and bisexual men. Specifically, although there were no significant findings for anxious arousal, sexual arousal emerged as a statistically significant predictor of engagement in UAI. Consistent with previous models that relied primarily on System 2 variables, results also showed that perceived behavioral control and self-efficacy significantly reduced the odds of UAI on a given day. Contrary to my hypothesis, sexual arousal and behavioral control, though each having significant main effects, did not interact in their influence on UAI. A second test of whether or not the influence of sexual arousal on UAI is mediated by perceived behavioral control was found to be statistically significant. These findings suggest that, although sexual arousal does not diminish the protective effect of perceived behavioral control on UAI, it can lead to reductions in perceived behavioral control that subsequently increase the odds of UAI.

It is worth noting that none of the variables measured at the day-level (i.e., anxious arousal, sexual arousal, and perceived behavioral control) had between-person level effects when their variance was decomposed into both within- and between-person components. Although sexual arousal and behavioral control both had significant effects as fluctuating, within-person factors at the level of the day, between-person dispositions at the level of the individual did not emerge as predictors of UAI. Between-person perceived behavioral control and safer sex self-efficacy were presumed to be highly related constructs, though self-efficacy emerged as a statistically significant individual-level predictor of UAI while between-person deviated behavioral control did not. In fact, in a post-hoc analysis performed to investigate their similarity, I found that the two variables were very weakly correlated ($r = 0.095, \text{ns}$). These
results may suggest that variables are best suited to answer questions on the level at which they were measured. Specifically, when measured with regard to how one is feeling on a given day, variables may be better suited for questions regarding within-person fluctuations in a construct whereas those that are measured with regard to how one generally feels may be better suited for questions regarding individual differences.
Chapter 9: Results of the Second Aim

The second aim of this dissertation was to investigate a series of hypotheses regarding the role of rejection sensitivity within the dual process model of sexual decision making. These hypotheses were developed to advance an understanding of sexual risk behavior that takes into account the social context in which sexual decisions are made. Furthermore, these hypotheses were designed to investigate a specific social psychological construct that may influence the dual processes examined within the first aim. As mentioned previously, all models were adjusted for the impact of HIV-positive status and relationship status, which were significantly associated with engagement in UAI, and results are presented only for comparisons between sex days without UAI and those with UAI, leaving out the comparisons for days on which there was no sexual activity (although these were included in the models).

Hypothesis 4

The fourth hypothesis was that condom-related rejection sensitivity (measured at the individual level) would be positively associated with engagement in UAI, such that those men with higher levels of rejection sensitivity would have higher odds of engaging in UAI on a given day. As can be seen in Table 6, condom-related rejection sensitivity (AOR = 1.56, \( p < 0.001 \)) was significantly and positively associated with UAI, such that a man who was one standard deviation higher than average on rejection sensitivity had 56% higher odds of engaging in UAI on a given day.

Hypotheses 5a and 5b

Table 7 displays the results of Hypothesis 5a, in which I proposed that condom-related rejection sensitivity would be positively associated with increases in daily levels of anxious arousal. As can be seen, there was a significant and positive association between condom-related
rejection sensitivity \((B = 0.07, p = 0.04)\) and anxious arousal, such that men with higher levels of rejection sensitivity also had higher levels of anxiety on an average day.

Table 7 also displays the results for Hypothesis 5b, in which I proposed that the previously demonstrated positive association between condom-related rejection sensitivity and daily anxious arousal would be strongest on days when men engage in anal sex with a casual male partner (i.e., there would be an interaction between rejection sensitivity and a dichotomous indicator of whether or not men engaged in anal sex in predicting daily levels of anxious arousal). In the full model, there remained a significant main effect of condom-related rejection sensitivity \((B = 0.08, p = 0.03)\), a non-significant main effect of whether or not men had anal sex with a causal partner \((B = -0.03, ns)\), and a marginally significant interaction effect between the two \((B = -0.03, p = 0.065)\). The marginally significant interaction is plotted in Figure 11 and suggests that, contrary to the hypothesized association, men who were higher in rejection sensitivity experienced lower levels of anxiety on anal sex days than on non-anal sex days.

**Hypothesis 6**

Table 8 displays the results for the sixth hypothesis, in which I proposed that dispositional (i.e., individual) levels of self-efficacy for condom use and condom-related rejection sensitivity would interact to predict UAI, such that condom-related rejection sensitivity would diminish the magnitude of the negative association between self-efficacy and UAI. As can be seen, significant main effects for both self-efficacy \((AOR = 0.55, p < 0.001)\) and rejection sensitivity \((AOR = 1.48, p < 0.001)\) were maintained and there was a statistically significant interaction between the two \((AOR = 1.25, p = 0.03)\). This interaction is plotted in Figure 12 and confirms the hypothesis that, for individuals higher in condom-related rejection sensitivity, self-efficacy had less of a protective effective against UAI.
Hypotheses 7a and 7b

In the final two hypotheses, I proposed that condom-related rejection sensitivity would interact with daily levels of anxious and sexual arousal to increase their positive associations with UAI. Results for both models are displayed in Table 9. In the model for anxious arousal, the main effects of daily fluctuations in anxious arousal (AOR = 0.94, \(ns\)) and dispositional (i.e., individual) tendencies towards anxious arousal (AOR = 1.21, \(ns\)) remained non-significant and the main effect for condom-related rejection sensitivity (AOR = 1.53, \(p < 0.001\)) remained significant, as they had in prior models. There was a non-significant interaction (AOR = 0.75, \(ns\)) between individual-level rejection sensitivity and within-person fluctuations in anxious arousal.

In the model for sexual arousal, the main effect of daily fluctuations in sexual arousal (AOR = 1.28, \(p = 0.03\)) was significant, the main effect of dispositional (i.e., individual) tendencies towards sexual arousal (AOR = 0.88, \(ns\)) was non-significant, and the main effect of condom-related rejection sensitivity (AOR = 1.47, \(p = 0.01\)) was significant. Consistent with the hypothesized association, there was a significant, positive interaction between individual-level rejection sensitivity and within-person fluctuations in sexual arousal (AOR = 1.25, \(p = 0.02\)), which is plotted in Figure 13. As can be seen, for men who were higher in rejection sensitivity, higher levels of sexual arousal than on an average day were associated with increased odds of UAI. Put another way, the impact of rejection sensitivity was negligible on days when men were less sexually aroused than usual and was pronounced on days when they were more sexually aroused than usual.

Aim 2 Discussion

The second aim of this dissertation was to extend the findings from the first aim utilizing a dual process model of sexual decision making and to investigate the extent to which rejection
sensitivity might be extended to the domain of condom use as a dispositional trait that influences cognitive-affective processing and UAI. Indeed, analyses demonstrated a significant and positive association between the newly developed condom-related rejection sensitivity scale and engagement in UAI. The next step was to investigate the mechanisms through which rejection sensitivity might act to increase the odds of UAI. In the first set of analyses, I tested a model and found support for the notion that individuals who are higher on condom-related rejection sensitivity have higher odds of UAI and also have higher levels of anxious arousal on a given day. Contrary to hypotheses in which I expected this to be particularly true on days in which a decision regarding condom use must be made (i.e., days on which participants had anal sex with a casual partner), results revealed that men who were highly sensitive to rejection actually had lower levels of anxious arousal on anal sex days than on non-anal sex days. This unforeseen association can be explained in several ways, one of which is that these individuals ultimately felt release from anxiety after having sex, potentially as a result of resolving their conflicting rejection sensitivity by avoiding rejection and achieving pleasurable sex (either by not wearing a condom or by wearing one but ultimately not being rejected as a result). Two other competing hypotheses must also be mentioned. First, this specific sample of highly sexually active men may find sex to be a form of stress relief, and this may be particularly true for those with high condom-related rejection sensitivity. Second, a reversal of the causal hypothesis might actually be the case, whereby men high in rejection sensitivity find sexual activity to be too stressful to engage in on days on which they are already experiencing higher than usual levels of anxiety.

The second mechanism I tested was that rejection sensitivity would not only act directly on engagement in UAI but also work to diminish the impact of a previously found variable that strongly reduces engagement in UAI—safer sex self-efficacy. Analyses confirmed the
hypothesis that rejection sensitivity and self-efficacy do interact in their association with UAI. Specifically, both maintained their opposite independent effects, but for those who were higher in rejection sensitivity, the impact of self-efficacy was diminished to almost nothing (i.e., those with high self-efficacy were nearly identical to those with low self-efficacy if they were high in rejection sensitivity). These findings suggest that one mechanism through which rejection sensitivity may act on UAI in addition to a direct effect is through its weakening of otherwise strong buffers against engagement in UAI.

In the final set of analyses, I sought to determine whether rejection sensitivity also predisposed men towards System 1 processing and, in doing so, further increased their odds of UAI beyond what would be expected by having high levels of rejection sensitivity alone. To do so, I tested for a cross-level interaction between rejection sensitivity and two forms of arousal—anxious and sexual. Consistent with results from analyses conducted for the first aim, findings regarding anxious arousal were non-significant. However, hypotheses regarding the interaction of condom-related rejection sensitivity and sexual arousal were confirmed. Specifically, both higher levels of sexual arousal on a given day and being an individual with higher than average levels of rejection sensitivity were significantly associated with increases in the odds of UAI. Moreover, for those who were both high in rejection sensitivity and experiencing greater levels of sexual arousal than they did on a typical day, the impact of each was strengthened. That is, on days when men were more sexually aroused than their average day, those who were high in rejection sensitivity had an increase in their odds of UAI relative to those lower in rejection sensitivity. These findings suggest that another mechanism through which rejection sensitivity acts to increase the odds of UAI is through a synergistic relationship with sexual arousal. Specifically, this association provides support for the notion of decisional myopia whereby men
become hyperfocused on the sexual situation, partner(s), or behaviors (as a result of heightened arousal and focus on immediate interpersonal consequences of condom use) and are unable to focus on potential future consequences such as HIV transmission.
Chapter 10: Discussion

Literature on dual processes in decision making (Ariely & Loewenstein, 2006; Evans, 2011; Loewenstein et al., 2001; Slovic et al., 2007; Slovic et al., 2005; Zajonc, 1980b, 1984) and social psychological models of cognitive-affective processing (Metcalfe & Mischel, 1999; Mischel & Shoda, 1995) suggest that behavioral decision making is guided by two simultaneous processes—Systems 1 and 2. Despite widespread recognition of these dual processes, the literature on sexual decision making has relied almost exclusively on the more deliberate, effortful, goal-focused, cognitive thinking characteristic of System 2 (Albarracin et al., 2005), leaving out the potential role for both affective-based System 1 processing and traits which might predispose individuals toward such processing, such as rejection sensitivity (Downey & Feldman, 1996). As such, the two primary aims of this dissertation were to elaborate and test a dual process model of sexual decision making for gay and bisexual men and to examine the extent to which rejection sensitivity could be extended to a behavioral phenomenon (i.e., condom use) and investigate potential mechanisms of its association with UAI.

To accomplish these aims, I utilized data from a larger, longitudinal project of highly sexually active gay and bisexual men which included both one-time CASI surveys and a 30-day online daily diary of affect and sexual behavior. I conducted a series of multilevel models with engagement in UAI as the primary outcome to test these aims. Further, I decomposed the variance of all daily measurements (i.e., anxious arousal, sexual arousal, perceived behavioral control) into their within-person and between-person components to examine the impact of these variables at both levels of analysis. Throughout the models, I examined a variety of hypotheses regarding both main and interaction effects of key variables—anxious arousal, sexual arousal, perceived behavioral control, safer sex self-efficacy, and condom-related rejection sensitivity.
Across all models, I adjusted for the significant role of HIV status and relationship status to remove their confounding effects.

Results of these dissertation analyses supported seven of my 12 hypotheses. Anxious arousal was the only variable for which no hypotheses regarding its association with UAI were supported. The first set of hypotheses predicted that within-person deviated anxious and sexual arousal would be positively associated with engagement in UAI and the second hypothesis regarding sexual arousal was supported by the results. Within the second set of hypotheses, I predicted that within-person deviated perceived behavioral control, between-person deviated perceived behavioral control, and individual-level (i.e., between-person) safer sex self-efficacy would all be negatively associated with engagement in UAI. Results supported the associations between within-person perceived behavioral control and individual-level safer sex self-efficacy but did not support the hypothesis regarding between-person behavioral control. In the third hypothesis I proposed that within-person deviated sexual arousal and perceived behavioral control would interact to predict UAI, which was not supported by results. Results did, however, reveal that perceived behavioral control mediated the association between sexual arousal and UAI, suggesting that sexual arousal leads people to perceive themselves as less in control of their sexual behavior which subsequently increases their odds of UAI.

In the fourth hypothesis—the first of the second aim—I predicted that individual-level condom-related rejection sensitivity would be positively associated with engagement in UAI, which was confirmed. The fifth set of hypotheses had to do with the role of rejection sensitivity in predicting daily levels of anxious arousal. Specifically, I predicted a significant and positive main effect such that higher rejection sensitivity would be associated with higher odds of UAI and this was supported by results. I also predicted that rejection sensitivity would be associated
with anxious arousal and would interact with a dichotomous indicator of whether or not the participant had any anal sex with a casual partner to predict anxious arousal, such that those who were higher in rejection sensitivity would experience greater anxious arousal on anal sex days when they must make a decision about condom use than on non-anal sex days. Despite a marginally significant finding, the effect was found to be in the opposite direction, such that individuals higher in rejection sensitivity experienced lower anxious arousal on anal sex days than on non-anal sex days. This finding may also suggest a reversed causal pathway, such that men who are high in rejection sensitivity find sex to be too much of a stressor and thus do not engage in sex on days in which they are already anxious. For the sixth hypothesis I proposed that individual-level condom-related rejection sensitivity and safer sex self-efficacy would interact such that the protective effect of self-efficacy on UAI would be diminished for those with higher levels of rejection sensitivity—this hypothesis was supported. In the final set of hypotheses, I proposed that individual-level rejection sensitivity would interact with within-person deviated anxious and sexual arousal such that individuals with higher rejection sensitivity would have a stronger association between arousal and UAI. As mentioned previously, the hypothesis regarding anxious arousal was not supported, though the hypothesis regarding sexual arousal was confirmed by analyses.

Taken together, these findings speak to several different themes within the literature—the role of System 1 processing in decision making, the importance of examining both within-person processes and between-person differences in decision making, and the role of rejection sensitivity as one form of cognitive-affective processing that can disrupt behavioral intentions and impair functioning during interpersonal decision making. Specifically, these findings point to the importance of considering the role of sexual arousal within existing models of sexual
decision making, the need to take into account fluctuations in psychological processes rather than assuming a constant influence over time, and the relevance of rejection sensitivity not only in typical interpersonal situations but also those that require interpersonal negotiation, such as condom use. These findings provide new theoretical insights into a phenomenon I have referred to as decisional myopia—the extent to which processes occurring in the “heat of the moment” cause individuals to lose sight of their long-term intentions and future consequences in favor of acting in the moment to achieve short-term sexual and interpersonal goals and reduce similar consequences. Furthermore, these findings have meaningful implications for present efforts towards behavioral HIV prevention. In the sections that follow, I describe each of these themes in more detail.

**Dual Processes and Sexual Decision Making**

The first aim of this dissertation was to elaborate a dual process model of sexual decision making that could take into account both System 1 (i.e., “hot,” affective) and System 2 (i.e., “cool,” cognitive) processing to provide a more holistic view of the decision making process. In doing so, I tested two different forms of arousal that could be considered to be “hot” or affectively-laden components of System 1—anxious and sexual arousal. The literature on the role of affect and arousal in decision making often spoke generally about these processes (e.g., the primacy of affect, the affect heuristic, somatic marker hypothesis, and risk as feelings hypothesis; Damasio, 1994; Loewenstein et al., 2001; Slovic et al., 2007; Zajonc, 1980b, 1984), and as such, I made consistent hypotheses regarding both forms of arousal. These hypotheses included a direct role of arousal on increasing sexual risk behavior (i.e., UAI) and interactions between arousal and cognitive processes (i.e., perceived behavioral control and self-efficacy). However, findings regarding these two forms of arousal were inconsistent with one another—
anxious arousal was unrelated to sexual risk behavior and hypotheses regarding its role in decision making were not supported, whereas sexual arousal was strongly and consistently related to sexual risk and hypotheses regarding its role were largely confirmed.

The lack of association found between anxious arousal and sexual risk behavior appears to echo the mixed findings by Crepaz and Marks (2001) in their meta-analysis on the association between negative mood—including anxiety—and sexual risk behavior. I initially echoed concerns raised by Kalichman and Weinhardt (2001) that a reliance on global assessments of mood (e.g., “climate”) rather than fluctuating affect (e.g., “weather”) and the use of cross-sectional assessments were likely to be driving factors behind their findings. However, the present study utilized both fluctuating levels of and individual-level dispositions towards anxious arousal within a longitudinal daily diary and found similarly non-significant effects. The findings of the present study stand in contrast to similar diary studies among gay and bisexual men mentioned previously. For example, Mustanski (2007) utilized a nearly identical approach and found that within-person fluctuations in anxious arousal were associated with increased levels of sexual risk whereas between-person dispositions towards anxious arousal were unrelated to risk.

Though these findings may simply suggest that anxious arousal is not particularly relevant to the sexual risk behavior of gay and bisexual men, other potential explanations are worth mentioning. First, Mustanski (2007) relied on separate measures of within- and between-person anxious arousal whereby individuals reported in a cross-sectional measure on their general tendencies towards anxious arousal and separately on a daily basis regarding how they felt that day. As I discuss further within the later section on within- and between-person processes, these two forms of measurement may produce results that are distinct from the disaggregation of daily measurements. The second possible explanation is that there may be
significant variation in the association between anxious arousal and sexual risk and the questions of for whom (i.e., moderators) and why (i.e., mediators) these associations exist and do not exist were not sufficiently examined within the present analyses. Indeed, a post-hoc examination of the random variation in the association between anxious arousal and UAI (not shown) revealed significant within-person variation in the effect. Moreover, studies to date have tended to focus generally on gay and bisexual men, whereas the current study focused on a very specific sample of gay and bisexual men engaging in 2-3 times the average amount of sexual behavior compared with other gay and bisexual men. As such, the sample had considerably higher levels of HIV-positive serostatus, reported significantly greater problems with controlling their sexual behavior, and are likely to have at least slightly distinct profiles of sexual decision making compared with more standard samples of gay and bisexual. The current results suggest that additional research is needed into the potential association between anxious arousal and sexual risk behavior that takes into account the issues of measurement, within- and between-person distinctions, the mechanisms of the association, and issues of sampling.

The significant findings regarding sexual arousal were consistent with much of the existing experimental and observational research conducted regarding its association with sexual risk behavior. Previous studies found a significant direct effect of sexual arousal on increased levels of sexual risk behavior in experimental research (Ariely & Loewenstein, 2006; Blanton & Gerrard, 1997) as well as the diary methodology by Mustanski (2007) previously discussed. In the present study, I sought to examine whether the influence of arousal could operate simultaneously with cognitive processes as dual process theories would suggest, but did not find support for the notion that the two do operate independently of one another. Specifically, the
impact of sexual arousal on UAI was reduced to non-significance when entered simultaneously with perceived behavioral control.

I further sought to test whether System 1 processes might thwart System 2 processes by reducing their overall impact on behavior as suggested by the risk as feelings hypothesis (Loewenstein et al., 2001). To do so, I tested for an interaction between sexual arousal and perceived behavioral control and found no evidence in support of this hypothesis. This finding stands in contrast to theories regarding affective interference in rational decision making (e.g., Loewenstein, 1996). However, analyses did reveal that sexual arousal acted indirectly on UAI by decreasing men’s perceptions that they were in control of their sexual behavior. It is important to note the distinctions between this hypothesis and the moderation hypothesis. The moderation hypothesis would have suggested that sexual arousal reduces the effectiveness of perceived behavioral control in preventing UAI. That is, perceived behavioral control is effective on its own but this effectiveness decreases in the face of arousal. Contrary to this hypothesis, the mediational hypothesis suggests that perceived behavioral control maintains its significant protective effect against UAI in the face of sexual arousal, but that sexual arousal reduces perceived behavioral control itself, thus acting upon UAI indirectly. This finding challenges theories suggesting that System 2 has the ability to cognitively control the more “wild” System 1 and provides evidence of the opposite—that System 1 can change the operation of System 2 by feeding it with affectively-tagged information that is used in making cost-benefit decisions (e.g., Finucane et al., 2000). These findings highlight the important role that sexual arousal plays in sexual decision making processes, and demonstrate the importance of considering visceral and affective influences alongside cognitive predictors of decision making in models of sexual risk.
behavior. Doing so may have meaningful implications for HIV prevention, which I discuss in more detail below.

**Condom-Related Rejection Sensitivity and Sexual Decision Making**

The second aim of this dissertation was to examine the extent to which individual dispositions toward interpersonal functioning—specifically rejection sensitivity—could be applied to sexual decision making and to investigate potential mechanisms of its association. Preliminary results revealed that four items of the newly created condom-related rejection sensitivity scale loaded well onto a single factor with good model fit and high internal consistency. Although rejection sensitivity has been applied to general interpersonal functioning (Ayduk et al., 2000; Downey & Feldman, 1996; Downey, Freitas, Michaelis, & Khouri, 1998) and functioning as a result of a stigmatized quality such as sexual orientation (Pachankis et al., 2008) or race (Chan & Mendoza-Denton, 2008; Mendoza-Denton, Downey, Purdie, Davis, & Pietrzak, 2002), this study was the first I am aware of that attempted to apply rejection sensitivity to a behavioral domain (i.e., condom use). As such, I first sought out to establish its relevance to condom use and found, as hypothesized, that individuals with higher levels of condom-related rejection sensitivity also have higher levels of non-condom use. Furthermore, I demonstrated that men higher in rejection sensitivity were also higher in anxious arousal on a given day, though they had lower anxiety on days in which they engaged in anal sex than days when they did not, contrary to my hypothesis. While these findings demonstrated the relevance of the rejection sensitivity construct to sexual decision making, I further sought to examine the mechanisms through which rejection sensitivity might act to increase sexual risk, particularly within the dual process framework investigated within the first aim.
Utilizing the cognitive-affective personality system and later theories inspired by it (Metcalf & Mischel, 1999; Mischel & Shoda, 1995), including rejection sensitivity, I proposed that rejection sensitivity may be a trait that causes individuals to shift focus from long-term intentions and goals to short-term priorities. Within the context of sexual behavior, I hypothesized that this would occur as a result of shifting focus from long-term health-protective behaviors (i.e., condom use) to short-term protection from being rejected and desire for sexual fulfillment. To examine this, I examined two moderating associations—first, that rejection sensitivity would moderate the association between safer sex self-efficacy and UAI; and, second, that fluctuations in sexual arousal would moderate the association between rejection sensitivity and UAI.

The first of these hypotheses, that self-efficacy and rejection sensitivity would interact to predict UAI, was supported. Not only was there a significant interaction between the two, both also maintained significant and opposite effects on UAI (i.e., rejection sensitivity was associated with increases in UAI while self-efficacy was associated with decreases in UAI). For participants who were high in self-efficacy, higher levels of condom-related rejection sensitivity significantly diminished the protective effect of self-efficacy. In fact, for those low in rejection sensitivity, the impact of having low self-efficacy versus high self-efficacy translated into nearly a 45% reduction in the probability of UAI on a given day compared to less than a 19% reduction for those high in rejection sensitivity. These findings highlight the first mechanism through which rejection sensitivity appears to act on UAI. Namely, fear of sexual rejection interferes with one’s ability to otherwise act efficaciously with regards to condom use. These findings are consistent with the proposition by Downey and Feldman (1996) that rejection sensitivity manifests itself through hypervigilance for rejection, placing a high priority on rejection avoidance, and thus
engaging in behaviors that may be incongruent with the level or type of threat. In fact, these findings suggest that the importance of avoiding rejection may be so strong that interpersonal protection (i.e., rejection avoidance) may become more motivating than health protection (i.e., condom use).

The second hypothesis regarding the moderating role of sexual arousal on the association between rejection sensitivity and sexual risk behavior was also supported. As hypothesized, I found that the risk-enhancing effect of sexual arousal on engaging in UAI was stronger for participants high in rejection sensitivity than those low in rejection sensitivity. In fact, results revealed that sexual arousal had a negligible effect on behavior among those who were low in rejection sensitivity, whereas being higher in sexual arousal on a given day increased the probability of UAI by nearly 30% for those with high rejection sensitivity. These findings suggest that rejection sensitivity is a trait that can enhance sensitivity to System 1 processes such as arousal, leading them to more strongly dominate decision making processes. One potential mechanism for this association, as previously mentioned, is that rejection sensitivity leads individuals to focus less on long-term intentions such as health-protective behaviors and focus more on immediate behaviors such as rejection avoidance (as suggested by the previously mentioned hypothesis) and sexual fulfillment (as suggested by the current hypothesis). Taken together, these findings suggest that, in addition to the SCT-based predictors of sexual risk that have been established in the literature (e.g., Albarracín et al., 2005; Albarracín et al., 2001), social psychologists might also consider investigating the role of interpersonal sensitivity in models of sexual decision making.

**Within-Person and Between-Person Processes**
Building upon previous research on the interaction of personality and situational processes (e.g., Mischel & Shoda, 1995), there has recently been a call for an investigation of differing levels of influence (i.e., within-person versus between-person) on sexual behavior (Cooper, 2010). Such an analysis would not only provide meaningful theoretical insights into the levels at which behavior is influenced (e.g., structural, individual, situational/contextual, etc.), it would also improve upon the ability to develop prevention strategies and interventions that are appropriately designed to target behavior at the most impactful level. Across both of the aims of this dissertation, I sought to simultaneously examine and compare the effects of within-person fluctuations in and more stable between-person dispositions toward psychological phenomena. To do so, I employed two separate approaches. First, I disaggregated daily measurements into their constituent within- and between-person effects using techniques in variance decomposition. Second, I included important theoretical variables at both levels and examined them simultaneously within models, often examining cross-level interactions as well. The results of this dissertation suggest that there is meaning at both levels.

Sexual arousal and perceived behavioral control—both measured at the daily level—had significant impact on sexual risk behavior when examining their within-person variation but not their between-person dispositions when both levels of influence were entered simultaneously and adjusted for one another. On the other hand, both variables measured at the individual level—self-efficacy and rejection sensitivity—had significant associations with UAI. There are two potential explanations for these findings that can be offered. The first is that variables work best at the level on which they are measured. Variables measured at the within-person level, even when decomposed into a more dispositional-level variable as well, may better capture within-person fluctuation and thus serve as better predictors at that level. Importantly, a post-hoc
analysis revealed that the between-person deviated measurement of perceived behavioral control was uncorrelated with the individual-level measurement of safer sex self-efficacy, despite their apparent similarity. It is worth noting that using the daily measurements without decomposing them into different levels would likely produce differing results, as the two are considered to be relatively independent of one another and the interpretation changes when looked at together. Another potential hypothesis is that within-person fluctuation is the more meaningful of the two levels—at least with the variables used in the present study—and the between-person level was only significant for those variables for which a within-person component was not simultaneously entered. These hypotheses are not mutually exclusive, nor are they the only two potential explanations. However, this study highlights the importance of continued research—both in social psychology more generally as well as in sexual decision making, specifically—regarding the relative contribution of within- and between-person processes. Dispositional traits may carry more or less salience across situations, and thus it is important to better understand the extent to which they are accessible across time. As such, future studies might examine the extent to which presumed dispositions such as self-efficacy and rejection sensitivity might fluctuate from day-to-day and across situations by including daily measures of them in future diary research.

**Theoretical Implications: Decisional Myopia**

The overarching goal of this dissertation was to examine a model of sexual decision making that could help to answer the question, “Why do people who seem predisposed to risk avoidance engage in HIV risk behavior?” This question is critical to the next generation of HIV prevention techniques, as more than three decades of research and prevention have now demonstrated that, while increases in self-efficacy, behavioral skills, and intentions to engage in safer sex can decrease risk behavior, even people with the highest levels of these cognitive-
behavioral traits often cannot maintain 100% condom use (Albarracín et al., 2001). In attempting to provide a preliminary answer to this question, I hypothesized that one of the mechanisms through which people may ultimately fail to act upon their intentions is that, in the moment, other processes get in the way. I referred to this phenomenon as decisional myopia—a process whereby decision making shifts from one’s strongly held long-term goals and intentions to more proximal and salient short-term pursuits.

The results of this dissertation provide preliminary support for the notion that, when making sexual decisions, the process of myopia can occur through at least four different mechanisms. First, high levels of sexual arousal appear to increase the focus on achieving immediate pleasure at the expense of focusing on the potential future health consequences. In this case, sexual arousal may take primacy over decision making and lead to short-term goals consistent with arousal such as pleasure-seeking (Ariely & Loewenstein, 2006). Second, sexual arousal may undermine individuals’ sense of control in the sexual situation, thus leading to reductions in the protective effect of behavioral control against UAI. Third, traits such as rejection sensitivity may lead to added outcomes and consequences to be weighed. For example, for a man high in rejection sensitivity, one consequence of condom use may still be HIV transmission but a second may be the pain or humiliation of rejection by his sexual partner (whereas it may only be the former for a man low in rejection sensitivity). In this case, myopia occurs as a result of a dispositional trait leading one to focus on more proximal, salient, and affectively-laden consequences than more distant, seemingly unlikely, and detached outcomes (Metcalfe & Mischel, 1999). Finally, these situational and personality variables may interact in their effect on decision making as suggested in the cognitive-affective personality system (Mischel & Shoda, 1995). In this case, myopia is likely to occur as a result of both increased
focus on the positive short-term goals consistent with the affective or aroused state as well as the negative short-term consequences of the otherwise “rational” or health-protective behavior (i.e., condom use).

**Implication for HIV Prevention**

The findings of this dissertation have several implications for HIV prevention research and practice. The primary implication is that sexual decision making results from the interplay of both rational decision making such as intentions and planning as well as social, interpersonal, and emotional processes. As previous research has acknowledged, sexual behavior is an inherently interpersonal pursuit and one that has consequences beyond health and HIV. Sexual behavior is often an expression of intimacy, an act of negotiation, and an experience of vulnerability (e.g., Golub, Starks, Payton, & Parsons, 2011). Furthermore, sexual decisions are often challenging to make within the moment and potentially lead to experiences of mixed feelings and conflict (e.g., Wells et al., 2011). The results of this dissertation build upon previous research by acknowledging that, in the “heat of the moment,” condoms are often not the first priority. Rather, people may be struggling with fears that their partner will reject them or will be sexually disappointed if they make the “wrong” decision. Future research is needed to continue to integrate variables into models of sexual decision making that acknowledge the realities of sex for those engaging in it. Prevention practice would do well to acknowledge these realities—in addition to efficacious models that work on increasing intentions to engage in safer sex and self-efficacy for engaging in safer sex (e.g., Montaño & Kasprzyk, 2002), intervention techniques aimed at increasing affect regulation or managing interpersonal sensitivity may improve efforts to reduce HIV transmission risk behaviors. While these findings suggest that increases in self-efficacy may act to partially buffer against the negative effects of rejection sensitivity on UAI,
those which target rejection sensitivity directly or, importantly, in unison with increases in self-efficacy, may have the largest effect.

Such techniques likely include cognitive-behavioral methods such as cognitive restructuring, exposure, and assertiveness training might be used. Cognitive restructuring and exposure have been demonstrated to reduce social phobia, a disorder that shares features in combination with the hypervigilance and anxiety characteristic of rejection sensitivity (Mattick, Peters, & Clarke, 1990). Moreover, research links rejection sensitivity to a lack of assertiveness (Pachankis et al., 2008), which is directly relevant to the context of condom negotiation practices and may be practically similar to self-efficacy. Therapeutic approaches that combine cognitive restructuring, exposure, and assertiveness training with others aimed at increasing emotion regulation, such as the Unified Protocol (Allen, McHugh, & Barlow, 2008; Ellard, Fairholme, Boisseau, Farchione, & Barlow, 2010; Wilamowska et al., 2010), have recently been demonstrated to be efficacious in preliminary trials and are currently being adapted and tested for their ability to deal with the specific needs of gay and bisexual men (Pachankis, in press).

The finding that perceived behavioral control and sexual arousal do not interact but rather that perceived behavioral control mediates the association between sexual arousal and UAI provides another important implication for prevention. The impact of sexual arousal on perceived behavioral control that leads to individual beliefs that behavior is out of one’s control when highly sexually aroused might be challenged as part of an HIV prevention intervention. The current findings suggest that, while higher levels of sexual arousal are associated with increases in risk, this does not impact the effectiveness of behavioral control in simultaneously reducing risk. Given that perceived behavioral control mediates this association, there is no direct association between arousal and UAI that needs to be challenged. Rather, breaking the
cognitive cascade that goes from increased sexual arousal to decreased feelings of control alone could have a direct impact on UAI. As such, intervention techniques aimed at increasing perceptions of behavioral control and reducing potentially maladaptive beliefs that sexual arousal undermines one’s self-control and self-efficacy may have significant impacts on sexual risk behavior.

In addition to therapeutic techniques aimed at reducing the cognitive-affective antecedents of risk identified in this study, these findings also suggest that the use of biomedical prevention strategies may be warranted. Specifically, HIV pre-exposure prophylaxis (PrEP) has been demonstrated efficacious in reducing the risk of HIV transmission among men who have sex with men (Singh et al., 2012). The current findings suggest that, even among men with high intentions to engage in HIV-preventive behaviors, the sexual context may undermine their self-efficacy and lead to inconsistent condom use. Although condom use requires volitional control and interpersonal negotiation during the sexual situation, taking PrEP on a daily basis within a non-sexually charged situation may be effective in preempting the loss of control and fear of interpersonal rejection that can result within sexual situations by providing an additional method of protection should condom use not be possible or desirable. In fact, the current study suggests that men who have desires to use condoms (i.e., those with higher self-efficacy) but find themselves unable to in a consistent fashion (i.e., those with higher rejection sensitivity, or anyone in a highly sexually arousing situation) may be ideal targets for PrEP. Specifically, these men have the motivation to prevent HIV that is likely to be necessary to adhere to a PrEP regimen while also having a need for its preventive impact. Moreover, given their higher-than-average levels of sexual activity, this sample of men may benefit more substantially from the additional protection of PrEP, may represent a group for whom PrEP may more significantly
reduce the concurrent transmission of HIV, and thus may be a group for whom PrEP is highly cost-effective. Additional research is warranted that examines the utility of PrEP for such men.

Limitations

The results of this study should be considered in light of their limitations. As is common in research with gay and bisexual men, this study relied on a convenience sample that was recruited in New York City and all engaged in above-average levels of sexual behavior at baseline. As such, the findings of this study are unlikely to generalize to general populations of gay and bisexual men and may also be unique to those who are more sexually active. The sample included in this dissertation study were also those who not only agreed to participate in the study, but also returned for longitudinal follow-up appointments and completed all the required components of the study including online CASI surveys from home and a 30-day daily diary. Men in monogamous relationships, young men, men without access to the internet, and men living outside of large urban centers who were not included in the present sample may show different patterns of associations with regard to their sexual decision making and behavior. Nonetheless, the sample used for the current study contains men who are likely to be at the highest risk for HIV transmission and thus represents a critical population within which to understand these associations. Future research is needed to determine the extent to which level of risk (or perception of risk) may be an important mediating or moderating variable in models of decision making.

Missing data present one of the largest difficulties in daily diary research. As described in Chapter 7, participants were missing 7.7 days of data, on average, and the median completion was 26 days. Given that the diary was comprised of a 30-day cycle, ample data were available for analysis with these completion rates. However, it remains unknown what data were missed
on the days when participants did not complete a diary. Specifically, it is possible that for some participants, the days on which they had the most sex or engaged in the most UAI were the days that presented the largest challenge in terms of completing the diary. As such, the data are limited to the extent that missed days may be biased towards sex days. However, this concern was at least partially dealt with by focusing the analyses only on the days on which a participant had sex, thereby reducing the potential confound that would otherwise be present if comparing days of UAI to all other possible days.

The multinomial logistic model limited the type of data structure that could be analyzed. Although the clustering within individuals was accounted for by virtue of the multilevel model, potential autocorrelation in the data was impossible to take into account. However, this concern was partially alleviated by the fact that the outcome was not associated with any of the different conceptualizations of time examined within Chapter 7. Further, while autocorrelation is common with continuous outcomes (e.g., mood tends to be relatively stable and increase or decline gradually over time), it is likely to be less common with categorical outcomes and particularly sexual behavior (i.e., engaging in UAI on one day is unlikely to be strongly related to whether or not an individual engages in UAI on the next day). Further investigation into the potential for autocorrelation in sexual behavior is needed.

Although the current study was designed to extend existing models to take into account a more complete picture of sexual situations (i.e., arousal, rejection sensitivity), the model was nonetheless incomplete. For example, the current study focused generally on “casual” partners—those with whom the participant did not consider himself to be in a primary, romantic relationship. However, there is wide variety within the definition of casual partners as to a participants’ familiarity with, knowledge of, and desire for the partner. Future research is needed
that takes into account the role of partner-level variables such as perceived HIV status, anonymity (or regularity) of their sexual encounter(s), and psychological variables such as trust and intimacy. Furthermore, the role of context was largely unexplored in the current study, though variables such as concurrent substance use or venue in which the behavior occurred (e.g., one’s apartment versus a sex party or bathhouse) are likely to influence both the predictors (i.e., arousal) and outcomes (i.e., UAI) in the current study.

Finally, the order of the data collection complicated the interpretation of the results. Specifically, the measures of affect, though assessed first in the diary, were still retrospective over the course of the day. Participants were not instructed to think about how they were feeling before engaging in sexual behavior but rather how they felt throughout the day as a whole. As such, it is possible that some of the effects, although a causal ordering was implied, are actually the result of a reverse process. For example, some men may have felt more sexually aroused as a result of engaging in UAI rather than engaging in UAI because they felt more sexually aroused. In line with Bem’s (1967) self-perception theory, participants may have observed their behavior (e.g., UAI) and inferred their affective and cognitive state at the time (e.g., high sexual arousal, low behavioral control) as a result of the behavior. Future research is needed to improve upon the ability to infer causal associations by assessing affect at a fixed point during the day (i.e., ecological momentary assessment) and separately assessing sexual behavior as a recall measure at the end of the day (i.e., daily diary).

**Conclusions**

This study provided support for the utility of a dual process theory for the investigation of sexual decision making, whereby the role of automatic, affective, and somatic processes are considered simultaneously with traditionally-used conscious, cognitive, and rational processes.
Further, this study demonstrated for the first time that the construct of rejection sensitivity can be meaningfully applied to behaviors in addition to personal traits, and provided preliminary evidence that condom-related rejection sensitivity is a valid and useful construct for consideration within existing models of sexual decision making and HIV risk behavior. I found that both within-person processes and between-person differences act simultaneously to influence sexual behavior, and that interactions between the two may provide meaningful new insights into sexual decision making. Finally, the results of this study suggested that models of sexual decision making should consider the ways in which decision making might be interrupted by a shift in focus from long-term to short-term outcomes as a result of dispositional traits such as rejection sensitivity and fluctuating processes such as sexual arousal. Future research should continue to examine the utility of dual process models among gay and bisexual men as well as other populations, taking into account the interpersonal, physical, and emotional nature of sexual behavior.
# Appendix: Condom-Related Rejection Sensitivity Scale

Instructions: Please read the following descriptions of situations and answer the questions that follow each one. Imagine each situation as vividly as you can, as if you were actually there.

1. *Imagine that you are talking with a new guy online who you want to hook up with. He asks you if you prefer to play safe or raw.*

   How concerned/anxious would you be that he would not want to have sex with you if you said you only play safe?
   - **Very Unconcerned**
   - **Very Concerned**
   ```
   1 2 3 4 5 6
   ```

   How likely is it that he would not want to have sex with you if you said you only play safe?
   - **Very Unlikely**
   - **Very Likely**
   ```
   1 2 3 4 5 6
   ```

2. *Imagine that you met a new guy at a bar or club one night and now you’re about to have sex with him.*

   How concerned/anxious would you be that he would not want to have sex with you if you pulled out a condom?
   - **Very Unconcerned**
   - **Very Concerned**
   ```
   1 2 3 4 5 6
   ```

   How likely is it that he would not want to have sex with you if you pulled out a condom?
   - **Very Unlikely**
   - **Very Likely**
   ```
   1 2 3 4 5 6
   ```

3. *Imagine that you have been dating a guy for a few weeks now. You are about to have sex and he suggests not using a condom.*

   How concerned/anxious would you be that he would not want to have sex with you if you insisted on using a condom?
   - **Very Unconcerned**
   - **Very Concerned**
   ```
   1 2 3 4 5 6
   ```

   How likely is it that he would not want to continue dating you if you insisted on using a condom?
   - **Very Unlikely**
   - **Very Likely**
   ```
   1 2 3 4 5 6
   ```

4. *Imagine that one of your friends introduces you to a new guy who he thinks you would like. After meeting, the two of you are really attracted to each other. You go back to his place and are about to have sex.*
How concerned/anxious would you be that he would lose interest in you if you brought up the subject of condoms?

Very Concerned
Very Unconcerned

1 2 3 4 5 6

How likely is it that he would lose interest in you if you brought up the subject of condoms?

Very Likely
Very Unlikely

1 2 3 4 5 6

5. *Imagine that you and a close friend are hanging out and he starts to get drunk and is flirting with you. The two of you start to hook up and he says he wants to fuck.*

How concerned/anxious would you be that he would be annoyed or upset if you insisted on using a condom with him?

Very Concerned
Very Unconcerned

1 2 3 4 5 6

How likely is it that he would be annoyed or upset if you insisted on using a condom with him?

Very Likely
Very Unlikely

1 2 3 4 5 6

6. *Imagine that you randomly run into an ex-boyfriend who you haven’t seen in a while and make plans to get together. The night goes really well and you are reminded of how great the sex used to be with him. The two of you decide to go back to his place and are about to have sex.*

How concerned/anxious would you be that he would be annoyed or upset if you insisted on using a condom with him?

Very Concerned
Very Unconcerned

1 2 3 4 5 6

How likely is it that he would be annoyed or upset with you if you insisted on using a condom?

Very Likely
Very Unlikely

1 2 3 4 5 6

7. *Imagine that you just met a really hot guy who you think might be a different HIV status than you. As the two of you begin to fool around, he suggests the two of you fuck raw.*

How concerned/anxious would you be that he would not want to have sex with you if you insisted on using a condom?

Very Concerned
Very Unconcerned

1 2 3 4 5 6
How likely is it that he would not want to have sex with you if you insisted on using a
condom?

<table>
<thead>
<tr>
<th>Very Unlikely</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Very Likely</th>
</tr>
</thead>
</table>

## Table 1

### Demographic Characteristics of the Study Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>43</td>
<td>20.8</td>
</tr>
<tr>
<td>Latino</td>
<td>34</td>
<td>16.4</td>
</tr>
<tr>
<td>White</td>
<td>100</td>
<td>48.3</td>
</tr>
<tr>
<td>Asian/Native Haw./Pac. Islander</td>
<td>7</td>
<td>3.4</td>
</tr>
<tr>
<td>Multiracial/Other</td>
<td>23</td>
<td>11.1</td>
</tr>
<tr>
<td><strong>HIV Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>115</td>
<td>55.6</td>
</tr>
<tr>
<td>Positive</td>
<td>92</td>
<td>44.4</td>
</tr>
<tr>
<td><strong>Sexual Orientation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gay, queer, or homosexual</td>
<td>188</td>
<td>90.8</td>
</tr>
<tr>
<td>Bisexual</td>
<td>19</td>
<td>9.2</td>
</tr>
<tr>
<td><strong>Employment Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>82</td>
<td>39.6</td>
</tr>
<tr>
<td>Part-time</td>
<td>53</td>
<td>25.6</td>
</tr>
<tr>
<td>Unemployed</td>
<td>72</td>
<td>34.8</td>
</tr>
<tr>
<td><strong>Highest Educational Attainment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school diploma, GED, or less</td>
<td>27</td>
<td>13.0</td>
</tr>
<tr>
<td>Some college or Associate's degree</td>
<td>61</td>
<td>29.5</td>
</tr>
<tr>
<td>Bachelor's or other 4-year degree</td>
<td>69</td>
<td>33.3</td>
</tr>
<tr>
<td>Graduate degree</td>
<td>50</td>
<td>24.2</td>
</tr>
<tr>
<td><strong>Relationship Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>141</td>
<td>68.1</td>
</tr>
<tr>
<td>Partnered</td>
<td>66</td>
<td>31.9</td>
</tr>
</tbody>
</table>

| Age (Range: 19 - 74; Median = 37)     | 38.5| 11.9 |

*Note. N = 207.*
Table 2

Results of the Confirmatory Factor Analysis of the Condom-Related Rejection Sensitivity Scale

<table>
<thead>
<tr>
<th>Item</th>
<th>Initial Model</th>
<th>Final Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unstd.</td>
<td>S.E.</td>
</tr>
<tr>
<td>1. Imagine you are talking with a new guy online who you want to hook up with. He asks if you prefer to play safe or raw.</td>
<td>1.00</td>
<td>0.00</td>
</tr>
<tr>
<td>2. Imagine that you met a new guy at a bar or club one night and now you're about to have sex with him.</td>
<td>1.05</td>
<td>0.11</td>
</tr>
<tr>
<td>3. Imagine that you have been dating a guy for a few weeks now. You are about to have sex and he suggests not using a condom.</td>
<td>1.18</td>
<td>0.14</td>
</tr>
<tr>
<td>4. Imagine that one of your friends introduces you to a new guy who he thinks you would like. After meeting, the two of you are really attracted to each other. You go back to his place and are about to have sex.</td>
<td>1.23</td>
<td>0.13</td>
</tr>
<tr>
<td>5. Imagine that you and a close friend are hanging out and he starts to get drunk and is flirting with you. The two of you start to hook up and he says he wants to fuck.</td>
<td>1.09</td>
<td>0.11</td>
</tr>
<tr>
<td>6. Imagine that you randomly run into an ex-boyfriend who you haven't seen in a while and make plans to get together. The night goes really well and you are reminded of how great the sex used to be with him. The two of you decide to go back to his place and are about to have sex.</td>
<td>1.21</td>
<td>0.13</td>
</tr>
<tr>
<td>7. Imagine that you just met a really hot guy who you think might be a different HIV status than you. As the two of you begin to fool around, he suggests the two of you fuck raw.</td>
<td>1.28</td>
<td>0.16</td>
</tr>
</tbody>
</table>

$\chi^2$ p-value < 0.001 0.207
RMSEA/SRMR 0.156/0.056 0.053/0.010
CFI/TLI 0.919/0.879 0.998/0.994
Table 3

Results of the Multilevel Models with Anxious Arousal and Sexual Arousal Predicting UAI.

<table>
<thead>
<tr>
<th></th>
<th>Model 1: Hypothesis 1a (Anxious Arousal)</th>
<th>Model 2: Hypothesis 1b (Sexual Arousal)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>95% CI</td>
<td>95% CI</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>AOR</td>
</tr>
<tr>
<td>Fixed Effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1 (within-person)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.55</td>
<td>0.58</td>
</tr>
<tr>
<td>Arousal</td>
<td>-0.13</td>
<td>0.87</td>
</tr>
<tr>
<td>Level 2 (between-person)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV-Positive Status</td>
<td>1.52</td>
<td>4.59</td>
</tr>
<tr>
<td>Partnered</td>
<td>-0.68</td>
<td>0.50</td>
</tr>
<tr>
<td>Arousal</td>
<td>0.33</td>
<td>1.39</td>
</tr>
<tr>
<td>Random Effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept Variance</td>
<td>1.19</td>
<td>--</td>
</tr>
</tbody>
</table>

Note. AOR = Adjusted Odds Ratio. CI = Confidence Interval.
Table 4

Results of the Multilevel Model with Perceived Behavioral Control and Self-Efficacy Predicting UAI

<table>
<thead>
<tr>
<th></th>
<th>Model 1: Hypotheses 2a and 2b</th>
<th>Model 2: Hypothesis 2c</th>
<th>95% CI</th>
<th>95% CI</th>
<th>p</th>
<th>95% CI</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1 (within-person)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.67</td>
<td>0.51</td>
<td>0.33</td>
<td>0.80</td>
<td>0.004</td>
<td>-0.85</td>
<td>0.43</td>
<td>0.27</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>-0.36</td>
<td>0.69</td>
<td>0.56</td>
<td>0.86</td>
<td>0.001</td>
<td>-0.31</td>
<td>0.73</td>
<td>0.59</td>
</tr>
<tr>
<td>Level 2 (between-person)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV-Positive Status</td>
<td>1.49</td>
<td>4.41</td>
<td>2.82</td>
<td>6.90</td>
<td>&lt; 0.001</td>
<td>1.06</td>
<td>2.89</td>
<td>1.84</td>
</tr>
<tr>
<td>Partnered</td>
<td>-0.69</td>
<td>0.50</td>
<td>0.31</td>
<td>0.80</td>
<td>0.004</td>
<td>-0.59</td>
<td>0.56</td>
<td>0.35</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>-0.02</td>
<td>0.98</td>
<td>0.64</td>
<td>1.50</td>
<td>0.916</td>
<td>0.03</td>
<td>1.03</td>
<td>0.68</td>
</tr>
<tr>
<td>Safer Sex Self-Efficacy</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>-0.64</td>
<td>0.53</td>
<td>0.42</td>
</tr>
<tr>
<td>Random Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept Variance</td>
<td>1.24</td>
<td>--</td>
<td>0.89</td>
<td>1.71</td>
<td>&lt; 0.001</td>
<td>1.06</td>
<td>--</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Note. AOR = Adjusted Odds Ratio. CI = Confidence Interval.
Table 5

*Results of the Multilevel Model with an Interaction Between Sexual Arousal and Perceived Behavioral Control in Predicting UAI*

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>AOR</th>
<th>Lower</th>
<th>Upper</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1 (within-person)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.78</td>
<td>0.46</td>
<td>0.29</td>
<td>0.73</td>
<td>0.001</td>
</tr>
<tr>
<td>Sexual Arousal</td>
<td>0.19</td>
<td>1.20</td>
<td>0.96</td>
<td>1.51</td>
<td>0.113</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>-0.41</td>
<td>0.66</td>
<td>0.51</td>
<td>0.85</td>
<td>0.001</td>
</tr>
<tr>
<td>Sexual Arousal × Perceived Behavioral Control</td>
<td>-0.01</td>
<td>0.99</td>
<td>0.73</td>
<td>1.35</td>
<td>0.953</td>
</tr>
<tr>
<td>Level 2 (between-person)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV-Positive Status</td>
<td>1.48</td>
<td>4.38</td>
<td>2.77</td>
<td>6.93</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Partnered</td>
<td>-0.68</td>
<td>0.51</td>
<td>0.31</td>
<td>0.82</td>
<td>0.006</td>
</tr>
<tr>
<td>Sexual Arousal</td>
<td>0.09</td>
<td>1.09</td>
<td>0.69</td>
<td>1.72</td>
<td>0.712</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>0.01</td>
<td>1.01</td>
<td>0.62</td>
<td>1.64</td>
<td>0.974</td>
</tr>
</tbody>
</table>

Random Effects

<table>
<thead>
<tr>
<th></th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept Variance</td>
<td>1.28</td>
</tr>
</tbody>
</table>

*Note.* AOR = Adjusted Odds Ratio. CI = Confidence Interval.
Table 6

*Results of the Multilevel Model with Condom-Related Rejection Sensitivity Predicting UAI*

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>AOR</th>
<th>Lower</th>
<th>Upper</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fixed Effects</strong></td>
<td></td>
<td></td>
<td>95% CI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1 (within-person)</td>
<td></td>
<td></td>
<td>95% CI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.77</td>
<td>0.46</td>
<td>0.30</td>
<td>0.72</td>
<td>0.001</td>
</tr>
<tr>
<td><strong>Level 2 (between-person)</strong></td>
<td></td>
<td></td>
<td>95% CI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV-Positive Status</td>
<td>1.16</td>
<td>3.18</td>
<td>2.03</td>
<td>4.98</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Partnered</td>
<td>-0.69</td>
<td>0.50</td>
<td>0.32</td>
<td>0.79</td>
<td>0.003</td>
</tr>
<tr>
<td>Condom-Related Rejection Sensitivity</td>
<td>0.45</td>
<td>1.56</td>
<td>1.26</td>
<td>1.93</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td><strong>Random Effects</strong></td>
<td></td>
<td></td>
<td>95% CI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept Variance</td>
<td>1.09</td>
<td>--</td>
<td>0.78</td>
<td>1.53</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

*Note.* AOR = Adjusted Odds Ratio. CI = Confidence Interval.
Table 7

Results of the Multilevel Model with Condom-Related Rejection Sensitivity, Engagement in Anal Sex, and their Interaction Predicting Anxious Arousal

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Model 1: Hypothesis 5a</th>
<th>Model 2: Hypothesis 5b</th>
<th>95% CI</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Lower</td>
<td>Upper</td>
<td>p</td>
</tr>
<tr>
<td>Level 1 (within-person)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>1.64</td>
<td>1.54</td>
<td>1.73</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Anal Sex Day with Casual Partner</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Level 2 (between-person)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV-Positive Status</td>
<td>-0.18</td>
<td>-0.31</td>
<td>-0.04</td>
<td>0.010</td>
</tr>
<tr>
<td>Partnered</td>
<td>-0.01</td>
<td>-0.15</td>
<td>0.13</td>
<td>0.917</td>
</tr>
<tr>
<td>Condom-Related Rejection Sensitivity</td>
<td>0.07</td>
<td>0.00</td>
<td>0.14</td>
<td>0.042</td>
</tr>
<tr>
<td>Cross-Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anal Sex Day with Casual Partner × Condom-Related Rejection Sensitivity</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Random Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept Variance</td>
<td>0.21</td>
<td>0.17</td>
<td>0.26</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Note. Outcome of this model is anxious arousal conducted using a linear mixed model. CI = Confidence Interval.
Table 8

*Results of the Multilevel Model with an Interaction Between Condom-Related Rejection Sensitivity and Safer Sex Self-Efficacy Predicting UAI*

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>B</th>
<th>AOR</th>
<th>Lower</th>
<th>Upper</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1 (within-person)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.95</td>
<td>0.39</td>
<td>0.25</td>
<td>0.60</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td><strong>Level 2 (between-person)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV-Positive Status</td>
<td>0.77</td>
<td>2.16</td>
<td>1.37</td>
<td>3.40</td>
<td>0.001</td>
</tr>
<tr>
<td>Partnered</td>
<td>-0.66</td>
<td>0.52</td>
<td>0.33</td>
<td>0.81</td>
<td>0.004</td>
</tr>
<tr>
<td>Condom-Related Rejection Sensitivity</td>
<td>0.40</td>
<td>1.48</td>
<td>1.20</td>
<td>1.84</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Safer Sex Self-Efficacy</td>
<td>-0.60</td>
<td>0.55</td>
<td>0.44</td>
<td>0.69</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Condom-Related Rejection Sensitivity × Safer Sex Self-Efficacy</td>
<td>0.23</td>
<td>1.25</td>
<td>1.02</td>
<td>1.55</td>
<td>0.034</td>
</tr>
</tbody>
</table>

| Random Effects                    |      |      |       |       |        |
| Intercept Variance                | 0.95 | --   | 0.69  | 1.30  | < 0.001|

*Note.* AOR = Adjusted Odds Ratio. CI = Confidence Interval.
Table 9

Results of the Multilevel Models with Anxious/Sexual Arousal, Condom-Related Rejection Sensitivity, and their Interaction Predicting UAI

<table>
<thead>
<tr>
<th></th>
<th>Model 1: Hypothesis 7a (Anxious Arousal)</th>
<th>Model 2: Hypothesis 7b (Sexual Arousal)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>95% CI</td>
<td>95% CI</td>
</tr>
<tr>
<td></td>
<td>B  AOR Lower Upper p</td>
<td>B  AOR Lower Upper p</td>
</tr>
<tr>
<td>Fixed Effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1 (within-person)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-1.27 0.28 0.20 0.39 &lt;0.001</td>
<td>-0.90 0.41 0.26 0.65 &lt;0.001</td>
</tr>
<tr>
<td>Arousal</td>
<td>-0.06 0.94 0.66 1.34 0.737</td>
<td>0.24 1.28 1.02 1.59 0.031</td>
</tr>
<tr>
<td>Level 2 (between-person)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV-Positive Status</td>
<td>1.19 3.30 2.09 5.21 &lt;0.001</td>
<td>1.13 3.10 1.94 4.94 &lt;0.001</td>
</tr>
<tr>
<td>Partnered</td>
<td>-0.69 0.50 0.32 0.79 0.003</td>
<td>-0.68 0.51 0.32 0.81 0.005</td>
</tr>
<tr>
<td>Arousal</td>
<td>0.19 1.21 0.77 1.89 0.415</td>
<td>-0.13 0.88 0.58 1.33 0.536</td>
</tr>
<tr>
<td>Condom-Related Rejection Sensitivity</td>
<td>0.42 1.53 1.23 1.89 &lt;0.001</td>
<td>0.39 1.47 1.16 1.87 0.001</td>
</tr>
<tr>
<td>Cross-Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arousal × Condom-Related Rejection Sensitivity</td>
<td>-0.29 0.75 0.52 1.08 0.121</td>
<td>0.23 1.25 1.05 1.51 0.015</td>
</tr>
<tr>
<td>Random Effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept Variance</td>
<td>1.10 -- 0.78 1.54 &lt;0.001</td>
<td>1.22 -- 0.89 1.66 &lt;0.001</td>
</tr>
</tbody>
</table>

*Note.* AOR = Adjusted Odds Ratio. CI = Confidence Interval.
Figure 1. Hypotheses 1a and 1b predict that within-person anxious and sexual arousal (System 1 processes) will each have positive main effects on UAI.
Figure 2. Hypotheses 2a, 2b, and 2c predict that the main effects of behavioral control (at both levels) and self-efficacy (System 2 processes) will have negative main effects on UAI.
Figure 3. Hypothesis 3 proposes that within-person sexual arousal (System 1) moderates the association between within-person perceived behavioral control (System 2) and behavior (UAI) and diminishes the overall negative impact of perceived behavioral control on UAI.
Figure 4. Hypotheses 5a and 5b suggest that rejection sensitivity leads to higher levels of anxious arousal on a given day. Further, anxiety is higher on sex days than non-sex days, and rejection sensitivity moderates this association such that individuals with higher rejection sensitivity have a stronger association between sex and anxiety.
Figure 5. Hypothesis 6 proposes that rejection sensitivity will moderate the association between self-efficacy and UAI, such that the protective effect of self-efficacy on UAI will be diminished for individuals with high levels of rejection sensitivity.
Figure 6. Hypotheses 7a and 7b suggest that individuals high in rejection sensitivity will have a higher positive association between anxious and sexual arousal and UAI.
Figure 7. The flowchart above specifies the composition of the sample used in this dissertation as they exist within the larger parent project.
Figure 8. The histogram above shows the number of diary entries completed by participants out of their 30-day cycles.
Figure 9. The figure above displays the original structure of the multilevel factor analysis of anxious and sexual arousal.
Figure 10. The figure above displays the final structure of the multilevel factor analysis of anxious and sexual arousal.
Figure 11. The figure above displays the interaction between condom-related rejection sensitivity and anal sex with a casual partner in their impact on daily levels of anxious arousal.
Figure 12. The above figure displays the interaction between condom-related rejection sensitivity and safer sex self-efficacy in their impact on the probability of engaging in UAI on a given day.
Figure 13. The above figure displays the interaction between condom-related rejection sensitivity and daily fluctuations in sexual arousal in their influence on the probability of engaging in UAI on a given day.
References


Bechara, A., Tranel, D., Damasio, H., & Damasio, A. R. (1996). Failure to respond autonominically to anticipated future outcomes following damage to prefrontal cortex. *Cerebral Cortex, 6*, 215-225.


