ASSESSING RELATIONAL COGNITIONS AMONG YOUNG GAY AND BISEXUAL MEN ON HEALTH OUTCOMES OF HIV AND MENTAL HEALTH

by

Jordan Sang

BA in Health Sciences, Simon Fraser University, 2013

MPH, New York University, 2016

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This dissertation was presented by

Jordan Sang

It was defended on

March 29, 2019

and approved by

Mary Hawk, DrPH, LSW
Associate Professor, Department of Behavioral and Community Health Sciences
Graduate School of Public Health, University of Pittsburgh

Nina Markovic, PhD
Associate Professor, Dental Public Health
School of Dental Medicine University of Pittsburgh

Todd Bear, PhD
Assistant Professor, Department of Behavioral and Community Health Sciences
Graduate School of Public Health, University of Pittsburgh

Derrick Matthews, PhD
Assistant Professor, Department of Health Behavior
School of Global Public Health University of North Carolina Gillings

José Bauermeister, PhD
Presidential Professor of Nursing, School of Nursing, University of Pennsylvania
Philadelphia, Pennsylvania

Dissertation Advisor:
James Egan, PhD
Assistant Professor, Department of Behavioral and Community Health Sciences
Graduate School of Public Health, University of Pittsburgh

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ABSTRACT

Young gay and bisexual men (YGBM) face multiple health disparities compared to heterosexual youth, including HIV risk and poor mental health outcomes. Relational cognitions (relational beliefs and expectations) may provide nuanced understanding of these disparities, but have not been fully explored among YGBM. In our first analysis, we identified six subscales on relational expectations (restrictions, masculine and gender norms, negative breakups, cheating, optimism, and immediacy) and two subscales on relational beliefs (sex beliefs and equality). In our second analysis, we tested these subscales on outcomes of receptive and insertive condomless anal sex (R-CAS and I-CAS). We found that YGBM with greater expectations of negative breakups were negatively associated with I-CAS (AOR=0.91; 95% CI: 0.85, 0.97) and R-CAS (AOR=0.92; 95% CI: 0.87, 0.97). YGBM with greater expectations of optimism were negatively associated with R-CAS (AOR=0.93; 95% CI: 0.88, 0.97), and positively associated with I-CAS (AOR=1.22; 95% CI: 1.15, 1.30). YGBM with greater expectations of cheating were positively associated with R-CAS (AOR=1.20; 95% CI: 1.14, 1.26) and immediacy was negatively associated with R-CAS (AOR=0.92; 95% CI: 0.88, 0.97). Among relational beliefs, YGBM with greater endorsement of sex beliefs had a negative association with R-CAS (AOR=0.81; 95% CI: 0.74, 0.89), and beliefs about equality (AOR=0.74; 95% CI: 0.67, 0.82) were negatively associated

with R-CAS. In our third analysis, we utilized the developed subscales from paper 1 to test for associations to outcomes of anxiety and depression. We found that YGBM with greater relational restrictions (β= -.06) had a negative association with depression, while expectations of negative break ups (β= .34) and optimism (β= .05) were positively associated with higher depressive scores. Among relational beliefs, beliefs about equality (β= .06) were positively associated with higher depressive scores. For anxiety, expectations of restrictions (β= -.17) were negatively associated with higher anxiety scores. Alternatively, we found the constructs of negative break ups (β= .31), and immediacy (β= .06) positively associated with higher anxiety scores. The public health significance of these analyses illustrates the importance of relational cognitions on health and well-being among YGBM. We support future interventions that focus on relational cognitions to reduce health disparities.

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PREFACE

I would like to take this time to thank the individuals who have helped me get to this point and who have supported me through my academic journey. First, I would like to thank all of my committee members for providing invaluable feedback on my work, and who have pushed me to become a better researcher. Importantly, thank you to José Bauermeister for letting me use the Virtual Love Study and who allowed me to join him at the University of Pennsylvania to complete these analyses. I would be remiss to also not thank Steven Meanley for his constant support during this process. There have been countless times he has taken the time to help answer a question, or calm me down when I was panicking about doing something I thought I did wrong. Steven has truly been an amazing friend and I look forward to continuing to work together in the future. Next, I would specifically like to thank Dr. Edmund Ricci for giving me the motivation to come into the office every day to complete my work. Apart from the delicious pots of warm coffee, his insightful conversations and cheery demeanor have been a highlight at my time at Pitt. To my parents, Ed and Rhonda, and my sister, Chelsea, I want to thank you for supporting me through this long journey, which has taken me to New York, and Pittsburgh, and finally back to Vancouver. Living apart has had its challenges, but evidentially, has made me stronger, and has made me cherish my relationships with you all even more. I would not have made it this far, had it not been for your unwavering love and support. Finally, to my partner, Richard, you will never know how much your love and support has meant to me. I am excited about our new adventures and am so grateful that you are in my life. In addition to my academic studies, I have also learned so much about love and relationships. Thank you for always being there for me, and thank you for putting a smile on my face every day.

1.0 INTRODUCTION

Young gay and bisexual men (YGBM) have higher rates of HIV risk and mental health problems compared to their heterosexual peers. Romantic relationships have been explored as significant factor for both health outcomes. However, research has mainly focused on YGBM in relationships. Extant literature on relational cognitions among single YGBM have yet to be fully explored. Among existing literature, research suggests that relational cognitions are associated with HIV risk among single YGBM, but have yet to be explored on outcomes of mental health. Existing scales that measure relational cognitions are not specific to YGBM. However, evidence suggests that YGBM grow up with unique experiences different than their heterosexual peers. Thus, these experiences may inform and modify relational cognitions among YGBM, and existing scales may not capture these nuances. Given substantial research on the association between romantic relationships and health outcomes among YGBM, and growing literature on relational cognitions, the next step in this research is to explore relational cognitions specific to YGBM to understand health disparities.

1.1 ADOLESCENCE, ROMANTIC RELATIONSHIPS, AND YGBM

Adolescence

Adolescence is an important period for identity development and exploration in youth. This period between childhood and adulthood is defined as the onset of puberty and consists of major physical, social, and emotional growth. While age ranges for this life phase have been defined differently, a broad range for this life phase includes the ages of 10 to 24 years old (Sawyer, Azzopardi, Wickremarathne, & Patton, 2018). This age range also includes the time of early adulthood, which is usually defined between 18 to 25. For consistency, this dissertation will use adolescence as a general term that includes early adulthood and younger ages, based on different age ranges in the literature (Copeland et al., 2013). In all, approximately 7% of all adolescents reported a same-sex attraction or relationship, with males reporting more same-sex attraction and relationships than females (Teasdale & Bradley-Engen, 2010). The period of adolescence is especially important for sexual minority youth, who grow up with unique experiences as compared to heterosexual youth (L. Diamond, 2003). Among these challenges, first sexual attraction, questions about sexuality, first sexual experiences, and sexual-identification may be especially confusing and troubling for sexual minority youth.

Romantic relationships among adolescents

Motivation to engage in romantic relationships among adolescents has been linked to developmental theory. Brown (1999) suggests that there are four stages in the process of romantic motivation: initiation, status, affection, and bonding. The process describes how youth seek romantic relationships to gain self-confidence, developing an emotional and sexual relationship with a partner, then, seeking commitment (Brown, 1999). Furthermore, from a developmental perspective, Furman and Wehner (1994) describe how romantic relationships are driven by several

motivators including biological (sexual-reproductive), affiliative, attachment, and caregiving. Explaining these needs further, examples include sexual desire (biological), connection and companionship (affiliative), commitment and reducing uncertainty (attachment and caregiving) (Furman & Wehner, 1994). Taken together, authors theorize that multiple factors influence motivation for romantic relationships, and that romantic relationships are intrinsic to human nature.

Collins et al. (2009) define romantic relationships as, "mutually acknowledged ongoing voluntary interactions. Compared to platonic peer relationships, romantic ones typically have a distinctive intensity, commonly marked by expressions of affection and current or anticipated sexual behavior" (Collins, Welsh, & Furman, 2009). Relationship exploration during adolescence may be beneficial because it provides youth with opportunities to master critical skills related to patience, mutuality, commitment, trust, and emotional regulation. Romantic relationships in adolescence have also been found to bolster emotional development, self-esteem and identity formation (Brown, 1999). Studies have found that youth who are not involved in any romantic relationships during adolescence transition to adulthood with fewer interpersonal and self-regulatory skills than youth with multiple romantic experiences (L. Diamond, 2003). Romantic relationships may serve as developmental lessons, which can strengthen adolescents' life perspective, and better prepare them for future relationships (Norona, Roberson, & Welsh, 2017). Moreover, Madsen and Collins (2011) used longitudinal research to examine the association between adolescents' dating experiences and quality in future relationships. The authors found adolescents who reported fewer dating experiences and better-quality relationships in early adulthood experienced smoother partnership skills in later adulthood, such as effective and timely caregiving/ seeking, and negotiation conflict to mutual satisfaction (Madsen & Collins, 2011). The

association between adolescent relationships and future relationship stability has been documented in other studies as well (I & J., 2002; Meier & Allen, 2009). However, research specific to sexual minorities and YGBM has not been adequately explored.

1.1.1 Context of Romantic Relationships among YGBM

It is suggested that sexual minority youth are less likely to engage in romantic experiences with same-sex individuals, compared to heterosexual youth, despite reporting desire to be in relationships (Dehaan, Kuper, Magee, Bigelow, & Mustanski, 2013; L. M. Diamond & Dubé, 2002). The absence of romantic experiences for sexual minority youth can result in delays or deficits in social competence, social support, self-esteem, and identity development (Lisa Diamond & Dubé, 1998). Diamond (2003) argues that the loss of these important interpersonal factors can be particularly detrimental to sexual minority youth because of difficulties maintaining close relationships with family and friends; thus, the emotionally intimacy and support of romantic partnerships may be especially valuable in mental well-being (L. M. Diamond, 2003). Additional barriers for engaging in romantic relationships for YGBM may include a lack of positive role models for same-sex relationships, community attitudes, which may discourage same-sex relationships, difficulty finding partners, and social isolation (L Diamond, Savin-Williams, & Dubé, 1999). Despite these theoretical barriers, a recent longitudinal study by Mustanski et al. (2011) found that 80% of YGBM reported at least one serious relationship in the past 18-months, and one-third reported three or more serious relationships. However, the sample was from a large Mid-Western city, and may not be indicative for all YGBM, especially those living in rural or more conservative areas (Brian Mustanski, Newcomb, & Clerkin, 2011).

Unique to YGBM and same-sex relationships is the effect of social stigma and discrimination based on sexual orientation, both internal and external. The effects of stigma present challenges in both relationship forming (development of romantic relationships) and relationship functioning (dynamics within a romantic relationship). Empirical evidence on sexual minority adolescents shows that youth who report same-sex attraction are more likely to experience violence and witness violence, compared with those who only report opposite-sex romantic interest (S. T. Russell, Franz, & Driscoll, 2001). Stigma may act as an external stressor on relationships resulting in negative effects on relationship functioning such as increased strain and decreased support, investment, and passion. Similar to other marginalized groups, relationship functioning in YGBM is vulnerable to social stigma and even more vulnerable to internalized stigma (Doyle & Molix, 2015). A coping mechanism to avoid external stigma is concealing sexual orientation and relationship status. However, concealing relationships may lead to fewer social supports (Mohr & Daly, 2008). Among GBM, concealing sexual orientation has been associated with lower mental health and greater internalized homophobia (Schrimshaw, Siegel, Downing Jr, & Parsons, 2013).

Overall, while most of the development literature on romantic relationships and adolescents is specific to heterosexual youth, literature that is specific to YGBM indicate disparities among this population in terms of relationship forming and functioning. While literature among adolescents suggests that romantic relationships can have both positive and negative effects on health, there is a dearth of knowledge about sexual minority youth and YGBM (L. M. Diamond, 2003).

1.1.2 Health and Romantic Relationships among YGBM

Sexual Risk

Compared to literature on heterosexual youth, literature on YGBM and sexual risk has mostly focused on HIV risk. Contextually, in the United States, YGBM are disproportionately affected by HIV. From 2008-2011, YGBM aged 13-24 were the age group with the greatest percentage increase in HIV infection (26%), and approximately 93% of diagnoses were the result of male-male sexual contact (Centers for Disease Control and Prevention, 2014). These trends are especially concerning for Black YGBM who report the largest increases in HIV infections among all racial/ethnic groups (Centers for Disease Control and Prevention, 2014). Romantic relationships are an important aspect in sexual health and HIV prevention as romantic relationships form the context for sexual behavior exploration (Coyle et al., 2014). However, limited understanding of how to target programs to YGBM dyads, and the dynamics of same-sex relationships, hinder prevention efforts (Newcomb & Mustanski, 2016). Qualitative literature on YGBM relationships indicate that romantic and sexual experiences are not static, but are constantly changing. The complexity of YGBM relationships demonstrate challenges for prevention that warrant attention from public health practitioners (S. Sullivan, E. Pingel, R. Stephenson, & J. Bauermeister, 2018).

In a seminal paper, Sullivan et al. (2009) first reported that 68% of new HIV infections among adult gay and bisexual men occur in the context of a serious relationship. Even more startling, for YGBM ages 18-29, this proportion was estimated to be 79-84%, while only 32% of new infections were from casual partnerships (P. Sullivan, Salazar, Buchbinder, & Sanchez, 2009). Prior to this study, little attention was spent on dyads and HIV prevention as a main factor in transmission. One possible explanation for these findings is that gay and bisexual men are less

likely to use condoms with a partner in a serious relationship as an expression of intimacy, trust, and commitment compared to in a causal relationship (Greene, Andrews, Kuper, & Mustanski, 2014; Newcomb & Mustanski, 2016). Trends in literature point to sero-sorting (choosing partners with same HIV status) as a reduction strategy to limit exposure to HIV risk (Eaton, Kalichman, O'Connell, & Karchner, 2009). In relation to romantic partnerships, the rates of unprotected anal intercourse (UAI) increase with familiar, known partners, while unknown partners have low rates of UAI (Newcomb & Mustanski, 2016; Newcomb, Ryan, Garofalo, & Mustanski, 2014). Moreover, Mustanski et al. (2011) found that labeling the relationship to be 'serious' resulted in an eightfold increase in UAI among YGBM (Brian Mustanski et al., 2011), while another study found this rate to be 12 times higher (Newcomb & Mustanski, 2016). It is concerning that YGBM are likely to classify their relationship serious after just six-months, as sexual risk may be further heightened with higher rates of primary partner turnover for YGBM (Brian Mustanski et al., 2011).

In consensual non-monogamous relationships, breaking sexual agreements and a lack of discussions about condom use and other protective measures is a concern for increased HIV risk (Wilkerson, Smolenski, Morgan, & Rosser, 2012). Exploring relationship dynamics associated with broken agreements, Gomez et al. (2011) found partners with higher levels of trust, communication, commitment and social support, were less likely to break sexual agreements (Gomez et al., 2012). These findings are consistent with other literature citing relationship satisfaction and positive relationship dynamics as factors for adhering to sexual agreements (Darbes, Chakravarty, Neilands, Beougher, & Hoff, 2014; Mitchell, 2014). Sociodemographic factors associated with greater likelihood of broken agreements among gay couples include younger age of partners, White partners in interracial relationships, lower income partners, and concordant HIV positive partners (Perry, Huebner, Baucom, & Hoff, 2016). Additionally,

substance use during sex was associated with breaking agreements (for condom use) and greater likelihood of UAI (Mitchell, Boyd, McCabe, & Stephenson, 2014; Wilkerson et al., 2012). More concerning is that HIV testing is often not discussed in sexual agreement making, thereby increasing sexual risk for both partners (Mitchell et al., 2017). These findings suggest the need for strategies that encourage greater discussion in sexual agreement making within partnerships to protect better both partners and decrease HIV risk.

Bauermeister (2015) identified sexual partner typologies among YGBM (romantic interests, friends with benefits, and hookups) and examined the association between these typologies and UAI. They also tested the association between self-efficacy, decisional balance to forego condoms (perceptions about condom use with partners including aspects of intimacy associated with condom use during sex), ideal relationship attributes, and limerence and UAI. The study found odds of UAI decreased in single YGBM indicating commitment ideation, and those who reported difficulty negotiating safer sex with casual partners. To the latter finding, the author suggests that YGBM who envision casual partners to be romantic partners may be more likely to engage in UAI but also report greater difficulty negotiating safer sex with these partners. Odds of UAI increased when participants reported difficulty negotiating safer sex with romantic partners, a decisional balance to forego condoms, and indicating passion ideation (José A. Bauermeister, 2015).

Corresponding to partner typologies, Bauermeister et al. (2014) also created safer sex self-efficacy typologies to explore the association between self-efficacy with regular and casual partners and UAI among YGBM (José A. Bauermeister, Hickok, Meadowbrooke, Veinot, & Loveluck, 2014). The analysis found YGBM who reported low self-efficacy with regular partners and high self-efficacy with casual partners also reported fewer experiences of UAI, which is

consistent with previous literature on sexual risk with different partners among YGBM (Newcomb et al., 2014). Additionally, participants who reported high self-efficacy with regular partners and low self-efficacy with casual partners were more likely to report UAI with multiple partners (José A. Bauermeister et al., 2014). Taken together, these studies add another layer to the literature and indicate the value of addressing self-efficacy and different sexual partnerships in HIV prevention interventions.

Although limited, other interpersonal factors that have been explored in relation to sexual risk and sexual partnerships among YGBM include partner abuse, partner characteristics, and power differentials. Koblin et al. (2006) first reported a significant relationship between partner abuse and violence with UAI and club drug use among YGBM (Koblin et al., 2006). Mustanski et al. (2011) further explored this and found physical and verbal pressure for forced sex among YGBM was also associated with increased UAI (Brian Mustanski et al., 2011). Among other partner characteristics, having an older partner (5+ year older) has been found to increase the rate of UAI, as well as feeling trapped or stuck in a relationship (Brian Mustanski et al., 2011; Newcomb & Mustanski, 2016). Taken together, power differentials in romantic relationships, coupled with a lack of developmental skills may result in lower sexual risk negotiation among YGBM (L. M. Diamond, 2003; Newcomb & Mustanski, 2016).

Moreover, these findings are troubling because YGBM are less likely to be aware of their HIV status compared to older GBM. The Centers for Disease Control and Prevention (CDC) reported 75% of GBM aged 18-19 and 68% of GBM aged 20-24 were unaware of their HIV infection (Centers for Disease Control and Prevention, 2010). These findings are consistent with previous literature, which points to YGBM who perceive their relationship to be monogamous and at low risk may not engage in active HIV testing (Greene et al., 2014). From a public health

standpoint, these findings signal an urgent need for HIV interventions that target sexual and romantic relationships and cover a wide range of issues relevant in the lives of YGBM including self-efficacy, navigating power differentials, and the importance of communication and risk within partnerships.

Mental Health

Lesbian, gay, bisexual, and transgender (LGBT) youth have an increased risk for mental health disparities compared to heterosexual youth, including depression, anxiety and suicide attempts. Using a national sample, Bostwick et al. (2010) found LGBT individuals had a greater likelihood of lifetime and past year mood and anxiety disorders. Among gay men, the rate for lifetime mood disorder was 42.3% compared to 19.8% for heterosexual men and 41.2% compared to 18.6% for lifetime anxiety disorder compared to heterosexual men. Bisexual men reported the highest rates of all mood and anxiety disorders (Bostwick, Boyd, Hughes, & McCabe, 2010). In LGBT youth, these mental health disparities also apply. Teasdale & Bradley-Engen (2010) used the National Longitudinal Study of Adolescent Health and reported that adolescents who report same-sex attraction were more likely to report depressed mood and suicidal tendencies. The authors add that stress and social support mediate this relationship and argue that increased stress (due to prejudice, victimization, stigma) and lower social support and acceptance lead to increased incidence and prevalence of mental health disparities among this population (Teasdale & Bradley-Engen, 2010). Such stressors may be especially harmful for racial/ethnic YGBM. Experiences of racial and sexual minority bullying have been significantly associated with increases in depression scores and more concerning, Black and Asian/Pacific Islander GBM are less likely to access mental health counseling or treatment (Hightow-Weidman et al., 2011; Storholm et al., 2013).

Given these disparities in mental health, it is important to understand potential protective factors for YGBM and sexual minorities. While protective for heterosexual youth, romantic relationships have been explored in a limited manner as a protective factor for sexual minorities and specifically YGBM (La Greca & Harrison, 2005). As such, romantic relationships may be a natural resilience factor to help cope with experiences of discrimination and negate negative mental health outcomes. It has been suggested that sexual minority youth may particularly benefit from romantic relationships because of added social support (L. M. Diamond, 2003). One longitudinal study of sexual minority youth found that when youth participated in romantic relationships, psychological stress lowered. However, this was not consistent with all population groups. While this was true for Black sexual minority adolescents, this relationship was not present for White adolescents, and the authors found bisexual youth reported higher rates of psychological stress when participating in romantic relationships (Whitton, Dyar, Newcomb, & Mustanski, 2018). The latter finding may be due to experiences of biphobia, which is homophobia specific to bisexual individuals (Yost & Thomas, 2012).

Another study of sexual-minority adolescents (lesbian, gay, bisexual, queer) found youth who indicate a lack of relationship experiences also report lower rates of relational esteem and more relational depression than their peers who reported engaging in same-sex romantic relationships (Glover, Galliher, & Lamere, 2009). Similarly, Bauermeister et al. (2010) reported that same-sex relationship involvement was positively associated with self-esteem in sexual minority males and negatively correlated with internalized homophobia in females (José A. Bauermeister et al., 2010). However, consensus on the benefits of romantic relationships among sexual minority adolescents is not clear. Russell and Consolacion (2003), used longitudinal data and found adolescents in same-sex relationships report the highest rates of suicidal thoughts in

comparison to single sexual minorities and heterosexual adolescents. Additionally, the authors report that sexual minority youth who are dating had less anxiety, but more depression, in comparison to heterosexual youth who are single (Stephen T. Russell & Consolacion, 2003).

These competing findings are also applicable to adult sexual minority populations. Multiple studies report romantic relationships beneficial for mental health outcomes (Liu, Reczek, & Brown, 2013; Parsons, Starks, DuBois, Grov, & Golub, 2013; Wienke & Hill, 2009), but a recent study from Feinstein et al. (2016) found no evidence that relationship involvement reduces mental health risk for lesbian/gay participants. Among bisexual participants, relationship involvement was significant for increased anxiety (Feinstein, Latack, Bhatia, Davila, & Eaton, 2016). Given the varied differences in mental health outcomes in romantic relationships, additional research is warranted for YGBM.

1.1.3 Socioecological Approach to Romantic Relationships and YGBM

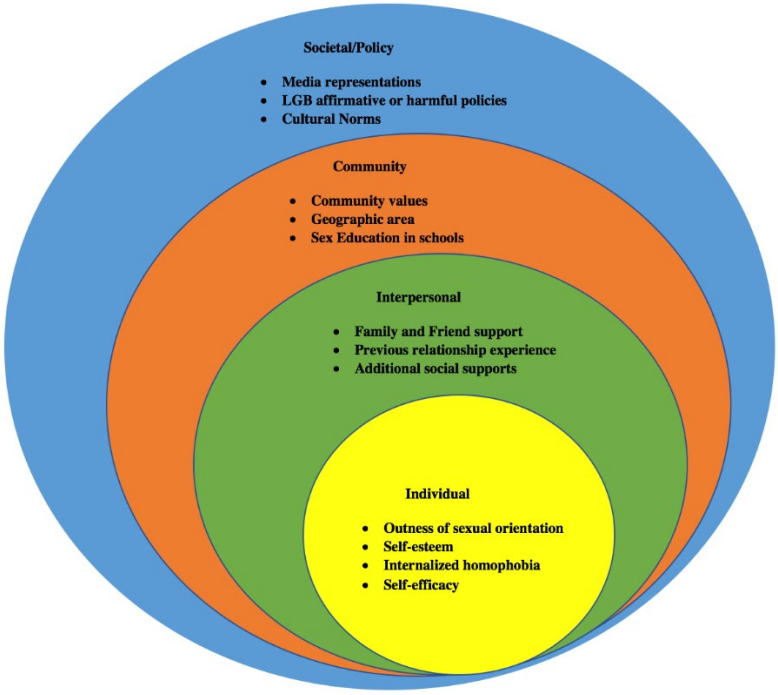

Figure 1-1: Socioecological factors that inform romantic relationships among YGBM

Given the significant associations between romantic relationships and health among YGBM, it is important to understand how various factors influence relationship forming and functioning among this population. The socioecological model (SEM) provides a framework to understand how romantic relationships are shaped across the ecological spectrum at the societal/policy, community, interpersonal, and individual level.

Societal/ Policy

At the most distal level of the SEM, cultural norms and social policies can provide a safe environment for LGBT youth and foster the growth of same-sex relationships (Hatzenbuehler, Keyes, & Hasin, 2009; Hatzenbuehler, McLaughlin, Keyes, & Hasin, 2010). Additionally, multiple authors have argued that hetero-normative cultural norms deny gay youth appropriate

opportunities to develop same-sex relationships, citing negative peer perceptions, limited social supports, and although now dated, lack of legal recognition of same-sex unions (Remafedi, 1990; Savin-Williams, 1996). Moreover, media representations may also inform relational cognitions and experiences. In a study of adolescents, consuming romantic media was associated with stronger endorsement of romantic beliefs and higher ratings of profile attractiveness (Hefner & Kahn, 2014). However, YGBM romantic relationships may not be represented in media, which may inform romantic beliefs and subsequent romantic relationships.

Community

The physical and social environment of YGBM can have large effects for romantic relationships. Living in a more conservative area versus urban area has been linked with greater psychological distress for rural YGBM. The authors report that rural YGBM were more likely to have concerns about acceptance from others, and more likely to conceal their sexual orientation compared to urban YGBM (Lyons, Hosking, & Rozbroj, 2015a). Additionally, lower support has been associated with greater psychological distress and increased sexual sensation seeking (Lyons et al., 2015a; Preston, D'Augelli, Kassab, & Starks, 2007). In a meta-analysis of 35 studies on stigma and romantic relationship functioning among sexual minorities, Doyle and Molix (2015) report that social stigma was more deleterious in the South and Midwest, and less deleterious in the North and West Coast (Doyle & Molix, 2015). These findings may be explained by social conservatism in these respected areas (e.g. LGBTQ rights in California compared to Mississippi). As a result of stigma and concealment, YGBM may be less likely to engage with other sexual minority youth and may have difficulty forming relationships. Moreover, among those in relationships, external stigma may impede on relationship functioning.

In the social environment, engagement with the gay community has been associated with increases socialization and social supports (Kelly, Carpiano, Easterbrook, & Parsons, 2014) Likewise, among a sample of adult GBM, Cerda et al. (2017) found that gay community attachment was negatively associated with depression and anxiety (Cerdá et al., 2017). In all, connectedness to the gay community can allow YGBM to meet other individuals, increasing social support, and can allow relationships to flourish in a safe and accepting environment. However, community stigma may deter YGBM from engaging in gay communities, thus barring them from its potential positive associations.

Sexual education plays a pivotal role in adolescence and can have lasting effects on sexual risk and healthy relationships (Schaalma, Abraham, Gillmore, & Kok, 2004). However, most programs are not inclusive of all students, despite a strong desire among YGBM (Pingel, Thomas, Harmell, & Bauermeister, 2013). Currently, only nine states are required to have sexual education that is inclusive of all sexual orientations (Institute, 2018). This lack of relevant education specific for sexual minority youth has been cited as a factor for the disparities of HIV among YGBM (Greene, Fisher, Kuper, Andrews, & Mustanski, 2015). Further, sexual education classes provide an ideal setting to include conversations about health romantic relationships for all students. In addition to sexual risk, a qualitative study of sexual minority youth identified communication with partners, relationship agreements, coping with family and relationship violence, and positive and lasting romantic relationships in the gay community as areas of interest in sexual and relationship education (Greene et al., 2015).

Interpersonal

Friends and family can have significant implications on relationship functioning. Among all adolescents, higher levels of commitment to parents and friends has been associated with higher

commitment with romantic partners in later adolescents (De Goede, Branje, van Duin, VanderValk, & Meeus, 2012). Specific to sexual minority youth, a longitudinal study found parental attachment was linked to older age of dating initiation and that peer attachment was linked to relationship length, and both of these were associated with mental health. The authors conclude that mental health is a mediator between peer and parental attachment in early adolescence and quality of relationships in later adolescence, but only bi-directional for peer attachment (Starks, Newcomb, & Mustanski, 2015). Moreover, among a sample of sexual minority youth, Shilo et al. (2011) found family support had the strongest negative effect on mental distress, while friends and family support had the strongest positive effect on mental well-being (Shilo & Savaya, 2011). Taken together, these findings indicate that both family and friend support can influence same-sex relationships.

Individual

Although research has indicated that the emotional qualities of same-sex relationships are similar to heterosexual relationships, there are specific individual factors that can affect relationship functioning for same-sex relationships and YGBM (Gottman et al., 2003). These individual factors stem from higher socio-ecological levels and affect both the individual and dyadic partnerships.

Internalized homophobia is an issue that most YGBM must resolve in their life, perhaps constantly. YGBM may internalize notions of shame, anxiety, devaluation of same-sex relationships, and worth of love. This toxic thinking can affect both relationship forming and relationship functioning. Research on internalized homophobia among same-sex relationships has found that internalized homophobia is associated with greater relationship problems, relationship

functioning, and length of relationships (Doyle & Molix, 2015; Frost & Meyer, 2009; Ross & Rosser, 1996).

Outness is another significant factor in relationship conflict, as being public about your relationship can affect social support and relationship dynamics. Clausell & Roismain (2009) note that individuals who were in a same-sex relationship and were open about it to their family and public had higher quality relationships compared to their closeted counterparts. Furthermore, if both partners were out, they reported greater relational satisfaction and positive affect. These findings are supported by qualitative interviews among YGBM who also note that if one partner is more guarded about the sexual identity and relationship, it could lead to conflict within a relationship (Clausell & Roisman, 2009; Kubicek, McNeeley, & Collins, 2015).

1.2 RELATIONAL COGNITIONS

Relational cognitions include assumptions about how relationships work, roles people should play in relationships, expectations about what will happen, and how people should behave. Together, these form the context for romantic relationship experiences and expectations. Moreover, relational cognitions may be health promoting, such as cognitions related to personal growth and adjustment in relationships, conflict resolution, communication, problem solving, and expressing love and care. Conversely, authors have identified unrealistic expectations as harmful to well-being. Extant literature on relational cognitions also explains that most individuals are unaware of cognitions they hold. However, authors argue that learning about cognitions can help better monitor behavior and improve mental health outcomes (B. F. Sullivan & Schwebel, 1995).

Within relational cognitions are relational beliefs and relational expectations. Relational beliefs are defined as generalized ideas, attitudes, and views of romantic relationships which are informed by observational learning from the social environment; these may or may not be linked to behaviors. Relational expectations are defined as hopes, desires, or fears about romantic relationships which are consequence of beliefs. Relational expectations are related to relational beliefs, but expectations occur when an individual links belief to behavior in hopes of achieving an outcome. Wigfield & Eccles (2000) argue that while beliefs and expectations are highly related empirically and load together in factor analyses, these constructs are theoretically distinct (Wigfield & Eccles, 2000).

Multiple factors can influence relational beliefs and expectations, including, film, media, internet, friends, and family. Subsequently, adolescents may develop hyper-romanticized beliefs and unrealistic expectations about love and romance (Berscheid, 2010; Sternberg & Weis, 2006). Relational cognitions may change over time, stronger feelings about romantic beliefs tend to decrease with time, and experiences such as break-ups can drastically lower ideal romantic beliefs (Sprecher & Metts, 1999). Vannier and O'Sullivan (2017) studied romantic beliefs and outcomes on relationship functioning among a sample of young adults (aged 18-28). The authors reported unmet romantic expectations were associated with lower scores of relationships satisfaction and commitment (Vannier & O'Sullivan, 2017). Furthermore, personality traits influence romantic attraction and along these lines, beliefs about love. Research has indicated that people are attracted to and pursue romantic relationships with individuals who have similar traits such as age, religion, political beliefs, adaptive personality traits (e.g. agreeableness) and maladaptive personality traits (e.g. antagonism) (Hudson & Chris Fraley, 2015; Sleep, Lavner, & Miller, 2017). These findings are consistent with the reinforcement-model, which hypothesizes how a person is attracted to

another person who provides them with positive reinforcements (Montoya & Horton, 2013; Singh, 1974). Taken together, extant literature has demonstrated multiple factors that may influence relational beliefs and expectations, however, these are not specific to YGBM.

1.2.1 Relational Cognitions and Health Outcomes among YGBM

The importance and interest of relational beliefs and expectations among YGBM is multipronged. First, most literature on relational cognitions has focused on outcomes of relationship functioning and has not directly studied health outcomes. Further research on cognitions and health outcomes may provide nuances findings. Second, literature has also focused on heterosexual adolescents, and little is known how YGBM think about same-sex relationship. Third, previous literature on relational cognitions has shown associations with future outcomes such as commitment and satisfaction in romantic relationships (Sprecher & Metts, 1999). Romantic relationships may be a resilient factor for sexual minorities against stigma and discrimination (Wienke & Hill, 2009). Last, relational cognitions are especially meaningful in the context of YGBM because of previously mentioned difficulties for YGBM in romantic exploration (potential lack of same-sex role models, potential difficulty finding partners, social isolation, internalized stigma, and external stigma) (L Diamond et al., 1999). Understanding how YGBM internalize relational beliefs and expectations can help promote healthy romantic relationships among this marginalized population.

Sexual Risk

A study from D'Augelli et al. (2008) revealed that most young gay and bisexual participants aspired to have long-term relationships, with more than half wanting monogamous relationships, and more than two-thirds expressing interest in raising children (D'Augelli, 2008).

This is consistent with other qualitative research that interviewed YGBM in the Castro District of San Francisco. The authors found that YGBM were motivated by desires of love to seek romantic relationships and that monogamy was strived for and assumed. However, prevalent gay community attitudes of prestige sex (having sex with multiple attractive partners) challenge this adherence to youths' romantic ideology (Eyre, Arnold, Peterson, & Strong, 2007).

Research has indicated that heterosexual youth who envision a future (how individuals conceptualize their future) are less likely to engage in risky behaviors that may deter from their future goals such as substance abuse, unintended pregnancies, and those that increase HIV risk (McWhirter & McWhirter, 2008; Rothspan & Read, 1996; Seginer, 2008). Future orientation has also been studied with older GBM, with the researchers reporting that older GBM who envision a future are less likely to engage in UAI and report fewer sexual partners (Appleby, Miller, & Rothspan, 1999). Research specific to YGBM and future orientation is limited, with findings suggesting future orientation is associated with greater condom use (Sosa-Rubí, Salinas-Rodríguez, Montoya-Rodríguez, & Galárraga, 2018).

Related to future orientation, romantic ideation is described as how YGBM idealize future romantic relationships. Bauermeister et al. (2012) identified two contrasting constructs of romantic motivation: ideation and obsession. Romantic ideation is described as positive normative thoughts about relationships, whereas romantic obsession is described as negative romantic thoughts about romantic pursuits. Using an adapted version of the romantic obsession scale to also include romantic ideation questions (defined as the Romantic Motivation Scale), the authors measured the effects of romantic ideation on outcomes of UAI. Romantic ideation was negatively associated with number of partners for UAI, and romantic obsession was positively associated with number of partners for UAI. The authors explain that individuals in the romantic obsession category may

underestimate risk, prioritize romantic desires over sexual health, and may use UAI as a means to intimacy (José A. Bauermeister, Ventuneac, Pingel, & Parsons, 2012).

Further exploring romantic ideation, the TLS (passion, intimacy, commitment) has been applied to YGBM on outcomes of sexual health. The construct of commitment was associated with fewer partners with UAI in the past two months, which is consistent with the ideals of actively pursuing long-term relationships and spending more time knowing partners before engaging in UAI (José A. Bauermeister, 2012). There were no significant associations for intimacy or passion, although the association between passion and UAI has been shown in other studies (José A. Bauermeister, 2015). The authors acknowledge this deviation and hypothesize differences may be due to measurement. However, the study that did find significant associations to passion and intimacy also controlled for decisional balance to forego condoms, and safer sex self-efficacy (José A. Bauermeister, 2015). Taken together, these findings begin to fill a gap in the literature on how YGBM pursue romantic relationships and outcomes of sexual health.

Mental Health

Relationship inauthenticity is defined as the incongruence between thoughts/feelings and actions within a relationship. This concept is related to relational expectations and has been explored among heterosexual adolescents. Soller (2014) identified that relationship inauthenticity was positively associated with severe depression, suicide ideation, and suicide attempts among young females (Soller, 2014). This relationship has also been explored among heterosexual adults in romantic relationships, with incongruence from ideal partner standards associated with greater emotional distress (Lackenbauer & Campbell, 2012). However, this has not been explored among YGBM.

While the association between romantic motivations and HIV risk has been explored, outcomes of mental health have been neglected. Furthermore, significant associations between romantic beliefs and mental health among heterosexual individuals implores additional research of mental health outcomes and relational beliefs and expectations among YGBM. Considering potential negative perceptions of relationships, and that YGBM are already disproportionately burdened by negative mental health outcomes compared to heterosexual youth, researching this topic is especially relevant (Teasdale & Bradley-Engen, 2010).

1.2.2 Creating a Framework to Understand Relational Cognitions among YGBM

A synthesis of the research has suggested multiple factors that can inform relational cognitions among YGBM. Taken together, the significance of interpersonal experiences and social influence on cognitive formation is cohesive with the concept of social-cognitive theory (SCT) (Anderegg, Dale, & Fox, 2014; Anderson, Kunkel, & Dennis, 2011; Whisman & Allan, 1996). SCT was developed by Albert Bandura and posits that learning is developed in social contexts between reciprocal interaction between person, environment, and behavior (Bandura, 2001). We apply SCT as a conceptual framework to understand relational beliefs and expectations among YGBM. Synthesizing the literature, multiple constructs emerged to illustrate how YGBM may develop relational beliefs and expectations. For example, previous literature has identified the role of the media on influencing ideas of love (e.g. love at first sight), relationships, and expectations (Hefner & Kahn, 2014). Moreover, the role of societal stigma as it relates to same-sex relationships and YGBM is another factor that can influence relational cognitions, relationship forming and functioning (Frost & Meyer, 2009). Gay community attitudes may also influence YGBM's ideas of love, one example being perceptions of monogamy and sex (Eyre et al., 2007). Moreover,

previous romantic relationships experiences can inform relational beliefs and expectations (Montoya & Horton, 2013). At the individual level, internalized homophobia and self-esteem are significant to perceptions about love, worthiness for love, and relationship outcomes (Mohr & Daly, 2008). Likewise, individual characteristics, such as personality traits, also act to influence romantic attraction, coupling, and romantic experiences (reinforcement-affect) (Hudson & Chris Fraley, 2015; Sleep et al., 2017). In all, a social cognitive conceptual framework helps to understand how multiple unique factors can influence relational beliefs and expectations among YGBM.

1.3 CONCLUSION

Extant literature has illustrated the importance of romantic relationships on YGBM health outcomes of HIV risk and mental health. Moreover, growing literature suggests that relational cognitions may provide a nuanced perspective to understanding health outcomes. Limited research among YGBM implores further research among this marginalized population. Given unique developmental experiences among YGBM, a SCT framework suggests relational beliefs and expectations may differ than their heterosexual peers. Incorporating relational cognitions into the public health field, specifically HIV and mental health prevention work, would be beneficial in complementing current knowledge that has mostly focused on dyadic groups. While the literature on HIV and mental health outcomes has largely ignored relational cognitions as a factor in prevention, incorporating this knowledge may increase efficacy and reduce incidence of HIV and negative mental health outcomes.

2.0 CURRENT DISSERTATION RESEARCH

This dissertation plans to address current gaps in the literature on relational beliefs and expectations among YGBM and health outcomes of HIV and mental health. Data and analyses were conducted using the Virtual Love Study. To be eligible, participants had to be between 18 to 24 years old; and report being single at time of data collection; had to have used a dating website in the past three months; and had sexual activity with a male partner that they met online in the past six months. The final sample included participants from 44 out of 50 states, and Puerto Rico.

Utilizing data from single YGBM, the first analysis applies exploratory and confirmatory factor analysis to relational cognition items developed from qualitative interviews. The second analysis builds on our first research study by applying developed relational subscales to test associations for HIV risk among YGBM. In our third analysis, we further broaden our understanding of relational beliefs and expectations among YGBM by testing the relational subscales on outcomes of depression and anxiety among YGBM.

This research is unique in that relational cognitions have been limitedly explored among YGBM, and current scales have not been developed specifically for this population. Utilizing a SCT framework, our relational subscales may provide nuanced findings that further our understanding of relational beliefs and expectations among YGBM. Moreover, our application of these subscales to health outcomes of HIV risk and mental health may provide evidence for direct associations between relational cognitions and significant health outcomes among YGBM. Further, our study focuses on single YGBM, while past research has focused on dyadic relationships. A focus on single YGBM betters our understanding of cognitions within and without relationships and may have a broader scope.

2.1 ANALYSIS 1: AIMS AND HYPOTHESES

Aim: Identify relational constructs (beliefs and expectations) among YGBM

Hypothesis: We hypothesized that there would be eight factors for how YGBM conceptualize relational expectations (passion, similarities, monogamy, breakups, lifestyle, masculinity, love, emotions) and five factors for how YGBM conceptualize relational beliefs in general (equality, sex, development, individual preferences, permanence).

2.2 ANALYSIS 2: AIMS AND HYPOTHESES

Aim: To test associations between relational beliefs and expectations on outcomes of number of partners for receptive and insertive condomless anal sex among YGBM.

Hypothesis: We hypothesize that constructs of relational restrictions, optimism, cheating, and equality will be associated with lower odds of both insertive and receptive condomless anal sex. Additionally, we hypothesize that constructs of masculine and gender norms, negative break ups, immediacy, and sex beliefs will be associated with higher odds for both insertive and receptive condomless anal sex.

2.3 ANALYSIS 3: AIMS AND HYPOTHESES

Aim: To assess how different relational beliefs and expectations are associated with outcomes of depression and anxiety among YGBM.

Hypothesis: We hypothesized that greater endorsement of relational constructs related to negative break ups, masculine and gender norms, immediacy, and cheating, will positively be associated with anxiety and depression. Alternatively, greater endorsement of constructs of optimism, equality, sex beliefs, and restrictions, will negatively be associated with anxiety and depression.

3.0 PSYCHOMETRICS OF RELATIONAL BELIEFS AND EXPECTATIONS AMONG YOUNG GAY AND BISEXUAL MEN

Jordan Sang, MPH

Department of Behavioral and Community Health Sciences

Graduate School of Public Health, University of Pittsburgh

3.1 INTRODUCTION

Interpersonal relationships are shared close bonds between individuals that can vary in duration and type. These relationships are based on social connection or commitment and are central to human functioning (Martin & Dowson, 2009). These relationships may be particularly significant during adolescence, as interpersonal relationships can influence healthy social and emotional development (Steinberg & Morris, 2001). Positive aspects of interpersonal relationships include the role of emotional support, companionship, happiness, and the potential buffer against stress (Wienke & Hill, 2009). Conversely, negative interpersonal relationships are associated with mental and physical distress (Stults et al., 2015). The context of interpersonal relationships can include familial bonds, friendships, work relationships, romantic relationships, and others (Martin & Dowson, 2009).

Romantic relationships are unique from other relationship types in that they may be defined by physical and emotional intimacy and constructs of romantic love. Important to note is that romantic relationships are learned, and common constructs include physical attraction, reciprocity,

similarity, attachment, and support (Hegi & Bergner, 2010). Building on this conceptualization of love and romance, our research extends the concept to include cognitions (i.e., relational beliefs about romantic relationships that include relationship functioning, ideation, and expectations). As with interpersonal relationships in general, relational cognitions play a pivotal role in romantic relationship experiences and these are often developed at a young and may change with increased cognition and emotional intimacy (Tukachinsky & Dorros, 2018). Findings from a longitudinal study of adolescents (aged 14-16) found that narratives of romantic relationships became more complex and elaborate over time (measured at 25 years old). Among single young gay and bisexual men (YGBM), Sullivan et al. (2017) used qualitative interviews and found YGBM believed relationship-related expectations change over time, along with fluctuating and evolving relationship typologies over time (S. Sullivan et al., 2018). These findings signal the malleable nature of cognitions, based on experiences, over the life course. However, compared to extensive literature among heterosexual youth, less is known about YGBM romantic relationships, and even less on, relational cognitions.

Social Cognitive Theory (SCT) provides an ideal framework to help understand how relational cognitions are developed (Bandura, 2001; Fiske & Haslam, 1996). Based on SCT, the social environment plays an important role in cognition formation and behavior, especially during adolescence with the development of biological changes in the brain, sexual awareness, and heightened interest in other people. Related to SCT, and relevant for YGBM, is the role of minority stress as it relates to unique developmental experiences among YGBM (Meyer, 1995). The theory posits that sexual minorities are subject to unique and chronic stressors related to their stigmatized identity, including internalized homophobia, expectations of rejection and discrimination. These stressors, in addition to daily stressors, disproportionately affect sexual minorities and may explain

health disparities (Meyer, 1995, 2003). Evidently, despite recent advancements in sexual minority acceptance in the United States, negative perceptions about sexual minorities and experiences of discrimination are still prevalent at the interpersonal, community, and institutional level (Kosciw et al., 2016; Pena, 2018); (Hatzenbuehler et al., 2014; Hatzenbuehler & Keyes, 2013; Kosciw et al., 2016). Thus, utilizing SCT and minority stress to understand YGBM cognition formation is useful when examining relational cognitions among this population. Based on SCT and minority stress, unique social experiences of sexual minorities may shape relational cognitions differently compared to heterosexual youth (Pachankis, Sullivan, Feinstein, & Newcomb, 2018) (Baldwin, 1992; Bandura, 2001). We define relational beliefs as generalized ideas, attitudes, and views of romantic relationships which are informed by observational learning from the social environment; these may or may not be linked to behaviors. Relational expectations are defined as hopes, desires, or fears about romantic relationships which are consequence of beliefs. Relational expectations are related to relational beliefs, but expectations occur when an individual links belief to behavior in hopes of achieving an outcome. Wigfield & Eccles (2000) argue that while beliefs and expectations are highly related empirically and load together in factor analyses, these constructs are theoretically distinct (Wigfield & Eccles, 2000). Thus, we follow this distinction in our research as the implications of beliefs and expectations vary.

Existing research has explored several aspects of relational outcomes among same-sex partnered gay and bisexual men (GBM). Disparate from heterosexual couples, same-sex couples often face stigmatization, both internally and externally, which can affect relationship forming and functioning. A meta-analytical review of 35 studies with same-sex couples by Doyle and Molix (2015) found an inverse association between social stigma and relationship functioning, and this association was moderated by stigma type (i.e. internalized vs perceived) and dimensions of

relationship functioning (i.e. strain, satisfaction, support) (Doyle & Molix, 2015). These findings highlight the unique experiences of GBM as it relates to same-sex relationships.

Moreover, research on same-sex partnered GBM also indicate that GBM are less likely to use condoms with a partner in a serious relationship compared to in a causal relationship as an expression of intimacy, trust, and commitment, also if they perceived the relationship to be monogamous (Greene et al., 2014; Newcomb & Mustanski, 2016). These findings are concerning as estimates from Sullivan et al. (2009) indicate that among YGBM aged 18-29, 79 to 84% of transmissions were attributed to a main or serious partner (P. Sullivan et al., 2009).

Although these studies provide valuable information on relational outcomes for dyadic partnerships, less literature exists measuring the effects of relational cognitions on health outcomes among single YGBM. Examining relational cognitions prior to partnership is significant as they may inform behaviors once in a relationship and inform strategies to change behavior. Using Sternberg's Triadic Love Scale (passion, intimacy, and commitment), Bauermeister (2012) tested constructs of love for associations with condomless anal sex among a sample of single YGBM and found a negative association between Sternberg's construct of commitment and condomless anal sex (José A. Bauermeister, 2012). Furthermore, Bauermeister et al. (2012) reported romantic ideation (characterizing ideal future relationships) to be protective for condomless anal sex, while romantic obsession (related to dependence, insecurity and doubt) increased risk for condomless anal sex (José A. Bauermeister et al., 2012). Most recently, Cook et al. (2018) found greater romantic fear (fear about not being in a romantic relationship) among YGBM was associated with increased receptive condomless anal sex, while greater romantic control (perceived control of relationship functioning) was associated with increased receptive and insertive condomless anal

sex (Cook, Halkitis, & Kapadia, 2018). Taken together, these findings illuminate growing literature on the effects of relational cognitions on health outcomes among YGBM.

Considering the relevance of SCT and minority stress in understanding and operationalizing relational cognitions among YGBM, prior research is limited by its exclusion of these perspectives among this population. Given the scope of relational literature, quantifying different aspects of this broad topic have varied in operationalizing factors (Sprecher & Metts, 1989)(Vannier & O'Sullivan, 2017). A similarity among these romantic beliefs and expectations scales is that they have been developed to account for heterosexual romantic relationships and love. While beneficial in developing psychometric research on relationships, these measures may not be valid for YGBM given the influence of the environment as explained by SCT. Thus, existing scales may not accurately account for YGBM experiences and perceptions. This void in the literature limits the understanding of relational beliefs and expectations among YGBM and outcomes associated with these cognitions.

Current Study

This study seeks to fill this gap in literature by validating scales that were designed to measure relational beliefs and expectations among YGBM. As part of a larger study, 30 semi-structured interviews were conducted about experiences of sexual education, dating and sexual behaviors among YGBM, and these constructs were asked to a larger audience of YGBM as part of a cross-sectional online study. The result of these interviews were fifty-items measuring relational expectations and 25 items that measured relational beliefs. Our research applied factor analysis to these questions to develop subscales that measure relational beliefs and expectations specific to YGBM. Initially we dichotomized questions into beliefs and expectations based on our definition of these constructs and latent question of each item. We then reviewed each item and

conceptualized how items would fit together, while also considering constructs that were consistent with extant literature on relationships. We hypothesized that there would be eight factors for how YGBM conceptualize relational expectations for themselves (passion, similarities, monogamy, breakups, lifestyle, masculinity, love, emotions) and five factors for how YGBM conceptualize relational beliefs in general (equality, sex, development, individual preferences, permanence).

Among relational expectations, we defined passion as it relates to intensity, sexual desire, and romantic vulnerability. We conceptualized this construct based on Sternberg's definition of passion, in addition to, existing literature on passion, which is focused on sexual passion and often involves a minimization of intimacy and love (Philippe, Vallerand, Bernard-Desrosiers, Guilbault, & Rajotte, 2017; Sternberg, 1986). Similarities was defined as likeness, similar interests, views, and partner characteristics. This construct was based on extant literature which identifies reinforcement affect (similar attitudes serve as positive reinforces and are associated with attraction) as a factor in relationship forming (Montoya & Horton, 2013; Singh, 1974). Monogamy was defined as the ideation for one romantic and sexual partner, associated with relationship exclusivity, and views on hypothetical cheating. This construct was defied in previous research as a highly regarded expectation in YGBM relationships (D'Augelli, 2008) and realistic difficulties in maintaining monogamy (Eyre et al., 2007). We defined breakups as they relate to confidence after ending a romantic relationship, coping, and reasoning for breakups. Based on extant literature, this construct has previously been explored among YGBM with significant associations to mental health outcomes (Ceglarek, Darbes, Stephenson, & Bauermeister, 2017). The lifestyle construct was defined to encompass aspects of drug use and gay community attitudes. This construct was conceptualized to account for gay community attitudes on relational expectations

(Eyre et al., 2007). Masculinity was defined as the influence and conformity of masculine and gender norms such as clothing and appearances on relational expectations. Masculinity has been explored among gay men as it relates to cognition, and also as a factor in partner selection (Phua, 2007). The construct of love was defined to encompass aspects of immediacy, growth in relationships, and equality. Among extant literature, these aspects have been explored independently as factors for relationship forming and functioning (Perry et al., 2016; Tashiro & Frazier, 2003; Vannier & O'Sullivan, 2018). Lastly, emotions were defined as it relates to emotional commitment, emotional security, and emotional intimacy. Based on previous literature, these aspects are significant for romantic relationship expectations (Ackerman, Griskevicius, & Li, 2011; Lehmiller & Agnew, 2006; Lemay & Razzak, 2016; Montesi, Fauber, Gordon, & Heimberg, 2011).

Among relational beliefs, we defined equality as beliefs about partners being equal in a relationship and relating to power dynamics. This construct was conceptualized to account for the role of power dynamics in relationship functioning (Perry et al., 2016). The construct of sex was defined as beliefs on the importance of sex in a relationship, and related to sexual intimacy. Previous literature has explored these concepts as factors in sexual and relational satisfaction in gay and heterosexual men (Pereira, Machado, & Peixoto, 2019). Development was defined as how relationships should develop and the timing of relationship development. Based on extant literature, authors have explored the role of culturally informed relationship scripts on development as they relate to relational well-being (Holmberg & MacKenzie, 2002). The construct of personal preferences was defined as individual characteristics in romantic relationships such as affection, express, and modelling. General literature on personal relationships have explored personal preference and desirability in relationship forming among adolescents and how

participants' belief about the importance of traits changed over time (Sprecher, Econie, & Treger, 2018). Lastly, permanence was defined as beliefs relating to lasting relationships, notions of 'happily ever after' and 'love at first sight.' Prior literature has explored these concepts as they relate to socio-ideation and relational beliefs (Sprecher & Metts, 1999; Vannier & O'Sullivan, 2017). For clarity, we include a conceptual model of how we believed items would hold together in Appendix A & B.

Our research utilizes a factor analysis to test these relational constructs on a sample of YGBM to develop relational expectation and belief scales. The contribution of YGBM-specific relational scales will help future research on relational beliefs to provide a better understanding of relational cognitions among this marginalized population. Moreover, these scales can support further analyses of relational expectations and beliefs as important predictors of relational and health outcomes among YGBM.

3.2 METHODS

Design

The relational beliefs and expectations items were included in the Virtual Love Study, an observational cross-sectional survey that examined YGBM's dating experiences online. The study ran from July 2012 until January 2013 and had an analytic sample of N=1,638 (José A. Bauermeister, Leslie-Santana, Johns, Pingel, & Eisenberg, 2011).

The relational beliefs and expectations items were developed from 30 semi-structured interviews that were conducted with YGBM about experiences of sexual education, dating and sexual behaviors. To be eligible for the qualitative interviews, individuals had to identify as male,

be between the ages of 18 and 24; be a resident of Michigan; identify as White/Caucasian, Black/African–American, or Hispanic/Latino; identify as non-heterosexual; report having used a dating website in the past 3 months; and report single at time of data collection.

Recruitment and Eligibility

The Virtual Love Study recruited participants through advertisements on two popular social networking sites, participant referrals, and flyers posted at local venues commonly frequented by YGBM. Ads were targeted to men who met inclusion criteria. Recruitment materials specified the incentive offered, eligibility criteria (broad definition of "dating websites") and the survey website. Eligibility for the Virtual Love Study differed slightly from eligibility for the qualitative interviews. To be eligible, participants had to be between 18 to 24 years old; and report being single at time of data collection; had to have used a dating website in the past three months; and had sexual activity with a male partner that they met online in the past six months. The final sample included participants from 44 out of 50 states, and Puerto Rico.

Data Collection

Participants were asked for their email to serve as their username, and this allowed participants to save answers as they moved through the survey so that they could exit the survey and come back at a later time if needed. Participants completed eligibility screeners and if inclusion criteria were met, they were prompted to complete consent forms. Next, consented participants completed an online questionnaire that assessed socio-demographic characteristics, Internet use, ideal relationship and partner characteristics, sexual behaviors, and psychosocial well-being. If participants did not complete the survey all at once they were sent two reminder emails encouraging them to complete the survey. Participants received a $10 electronic gift card for completing the survey. All study procedures were approved by the University of Michigan

Institutional Review Board. The University of Pittsburgh Institutional Review Board approved the use of these secondary data analyses with de-identified data.

Measures

Sexual identity

Sexual identity was assessed with the question "If you had to select just one identity, which would most closely fit how you identify?" Responses were, Gay/Homosexual, Bisexual, Straight/heterosexual, Same gender loving, MSM, or Other. Heterosexual and Other identified participants were removed from analysis. The remaining responses were dichotomized as follows: gay/homosexual, same gender loving, and MSM were combined into one category, and bisexual identity was kept separate.

Racial/Ethnic Minority Status

Race was assessed with the question, "What is your race?" Response options included White/Caucasian, Black/African American, Asian/Pacific Islander, Middle Eastern, Native American, and Other. Ethnicity was assessed with the question, "Are you Hispanic/ Latino?" Response options were "Yes" or "No." Due to small sample sizes for racial/ethnic minorities, we dichotomized race/ethnicity into minority status. Participants who indicated that they were White/Caucasian only and who responded "No" to ethnicity were identified as Non-Hispanic White. Participants who indicated at least one race other than White or who indicated "Yes" to ethnicity, were identified as racial/ethnic minorities. This procedure is consistent with previous analyses of these items (José A. Bauermeister et al., 2012).

Education

Education was assessed with the question, "What is the highest level of education that you have completed?" Responses options were 8th grade or less, Some high school, High school/ GED,

Technical School, Associate degree, Some college, College, Some graduate school, and Graduate school. Given the limited number of observations, we combined the responses 8th grade or less, and Some high school into "Less than high school," and Technical school and associates degree into "Technical/Associates." This procedure is consistent with previous analysis of these items (José A. Bauermeister et al., 2012).

Relational Expectations

The survey included 50 items that asked participants their beliefs and expectations about romantic relationships. These questions focused specifically on what participants idealized or expected from their own relationship. Some questions included, "I do not want to be monogamous because it means I would have to commit to one person," "My partner's political views must complement mine," and "I can forgive my partner if he has lied to me." Participants responded through a five-point Likert scale ranging from "Not True" (1) to "Very True." (5)

Relational Beliefs

The relational belief questions consisted of 25 items that asked participants about general beliefs about love and romantic relationships, which are distinct from relational expectations. Some example questions included, "It takes time to fall in love, "It is important that romantic relationships develop from friendships," and "Sexual chemistry is important in a romantic relationship." Participants responded through a four-point Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (4).

Analytic Procedure

The total sample consisted of 1,638 respondents. We excluded three participants with missing data for sexual identity, 28 participants who identified as straight/ heterosexual, and 25 participants who identified as "Other" sexual identity. Based on the scope and focus of the research

questions, and following the lead of other analyses using this dataset, we removed these participants for a final sample size of 1,582 (José A. Bauermeister et al., 2011). As advised by Armstrong & Soelberg (1968), several methods can be employed to pursue factor analysis and reliability, including *a priori* analysis of random split samples (Armstrong & Soelberg, 1968). Based on existing knowledge, our study utilized *a priori* analysis, in which we conceptualized how items would group together and the number of factors expected (See Appendix A & B). Using SPSS, we used random selection to split the sample into roughly two equally sized sub-samples for independent exploratory factor analysis (EFA) (N=880; 55% of sample). The first subsample was used to refine the factor analysis until conceptual and statistical adequacy was achieved. Our second subsample (N=702; 45% of sample) of participants was used to verify that the observed factor structure from our EFA was replicated. This factor analysis approach provides an alternative method to assessing model fit indices and ensures factor reliability within the analyses. This approach has been applied across multiple disciplines (Daire, Dominguez, Carlson, & Case-Pease, 2014; Holm & Hofmann, 2017; Koenig, Ames, Youssef, Oliver, Volk, Teng, Haynes, Erickson, Arnold, O'Garo, et al., 2018; Koenig, Ames, Youssef, Oliver, Volk, Teng, Haynes, Erickson, Arnold, O'Garo, et al., 2018).

EFA was used in the first half-sample to determine how many factor structures existed, how many factors to keep, and for data reduction to improve parsimony among items. We applied principal axis factoring (PAF) for extraction with varimax orthogonal rotation. PAF was chosen due to the exploratory nature of our research and openness in our measures of relational beliefs and expectations, and our assumption of latent constructs. Correspondingly, varimax orthogonal rotation was applied with the assumption that the factors from our analysis would be uncorrelated, we removed items with rotated factor loadings less than 0.45. Following this, confirmatory factor

analysis (CFA) was performed to replicate the results found in the EFA with the second half of our sample. Our CFA analysis relied on scree plots to indicate matching factor extraction, as well as ensuring factor loadings loaded in the same direction, did not cross-load greater than 0.5, were unidimensional, and loaded similar to those found in the EFA. We then used the full sample for a final factor analysis to test factor structures and loadings. Internal reliability was assessed with Cronbach's alpha for each analysis. Analyses were generated using SPSS (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.).

3.3 RESULTS

Table 3-1: Sample Characteristics

Variable	M (SD)
Age	20.77 (1.90)
Sexual Identity	N (%)
Gay/ Homosexual/ Same gender loving/ MSM	1530 (96.7)
Bisexual	52 (3.3)
Minority Status	
White	1034 (65)
Racial/ Ethnic Minority	548 (35)
Education	
Less than high school	61 (3.8)
High school	336 (21.2)
Technical/ associate degree	95 (6)
Some college	768 (48.4)
College	229 (14.4)
Some graduate school	82 (5.1)
Graduate school	13 (0.8)

Sample Characteristics

The average age for participants was 20.77 with 96.7% of the sample identifying as gay, homosexual, same gender loving or MSM, and 3.3 % identifying as bisexual. Most participants identified as white (65%), while 548 participants identified as a racial/ethnic minority (35%). In terms of educational attainment, 48.4% of the sample had some college education, followed by high school education (21.2%), college degree (14.4%), technical/associates degree (6%), some graduate school (5.1%), less than high school education (3.8%), and graduate school (0.8%). To ensure our split samples were equivalent, we tested group differences using chi-square tests and t tests, and found no significant differences between groups. Full sample demographics can be found in Table 3-1.

Exploratory Factor Analysis

We conceptualized eight factors for the relational expectation and ideation questions. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) was 0.742, signifying the data were acceptable for factor analysis (Cerny, 1977; "Kaiser-Meyer-Olkin value (KMO value)," 2007). After conducting individual factor analyses, 13 factors emerged from the data with eigenvalues above 1.0 and these factors were retained. We subsequently tested all remaining items for further factor reduction and nine factors emerged. Four factors were reduced or dropped during this process. For example, items from the lifestyle factor loaded onto the restriction factor, masculine and gender norms were combined, and some items from the emotions factor were removed based on factor loading. Based on recommendations for factor loading cut-offs and cross-loading, we tested and removed items that had a factor-loading cut-off below 0.45 or that cross-loaded above 0.5 (Costello & Osborne, 2005). Six items were removed during this process for a final factor solution of eight factors with an eigenvalue above 1.0, which explained 68% of the variance. We

decided to keep eight factors, which was supported the scree plot, (See Figure 1). Six factors had a Cronbach's alpha above 0.7, indicating acceptable reliability (Christmann & Van Aelst, 2006). Full variance and alphas can be found in Table 3-2.

We conceptualized five factors for the relational belief questions. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) was 0.649, indicating sampling adequacy is mediocre factor analysis (Cerny, 1977; "Kaiser-Meyer-Olkin value (KMO value)," 2007). Testing each concept individually, we identified seven factors within the relational belief questions using principal axis factoring and varimax rotation. We then followed the same steps applied for the relational expectation questions, removing cross-loading factors above 0.5, and items that loaded onto factors below 0.45 in a stepwise process. Our final factor solution indicated four factors explaining 66% of the variance.

Naming Factors

Assessing factor structure and items, we named factors based on themes within items. Among the relational expectation and ideation factors the factor with the greatest eigenvalue consisted of seven items. Example items include "I would want to be in a relationship where I'm allowed to date other people," "Committing to a serious relationship right now would keep me from enjoying my life," and "I would date someone who is into party-and-play (PnP)." These items explore different aspects of relationships, such as commitment, lifestyle choices, and relationship types. However, all seven items measure an aspect of relationship restrictions, thus, we named this factor, "Restrictions." Another example is the factor we identified as "Cheating", which consists of two items, "If I cheated on my partner I would expect him to break up with me" and "If my partner cheated on me, I would break up with him." These two items correspond to cheating within

a relationship and actions of cheating. A full table of items and corresponding factors can be found in Table 3-3.

Table 3-2: Total Variance Explained by Factors

	Factor Name	# of Items	Individual Cronbach's α	Total Eigenvalue	Variance %	Cumulative %
			Relational Expectations			
1	Restrictions	7	.779	4.037	16.147	16.147
2	Negative Break-ups	4	.861	3.015	12.060	28.207
3	Masculine & Gender Norms	4	.782	2.540	10.159	38.366
4	Optimism	2	.835	2.243	8.973	47.339
5	Cheating	2	.776	1.432	5.728	53.067
6	Immediacy	2	.734	1.349	5.394	58.461
7	Family & Friends	2	.689	1.230	4.921	63.383
8	Similarity	2	.649	1.137	4.547	67.930
			Relational Beliefs			
1	Sex Beliefs	3	.780	2.336	23.362	23.362
2	Equality	2	.738	1.719	17.187	40.549
3	Modeling	3	.476	1.473	14.729	55.278
4	Happily Ever After	2	.478	1.096	10.959	66.237

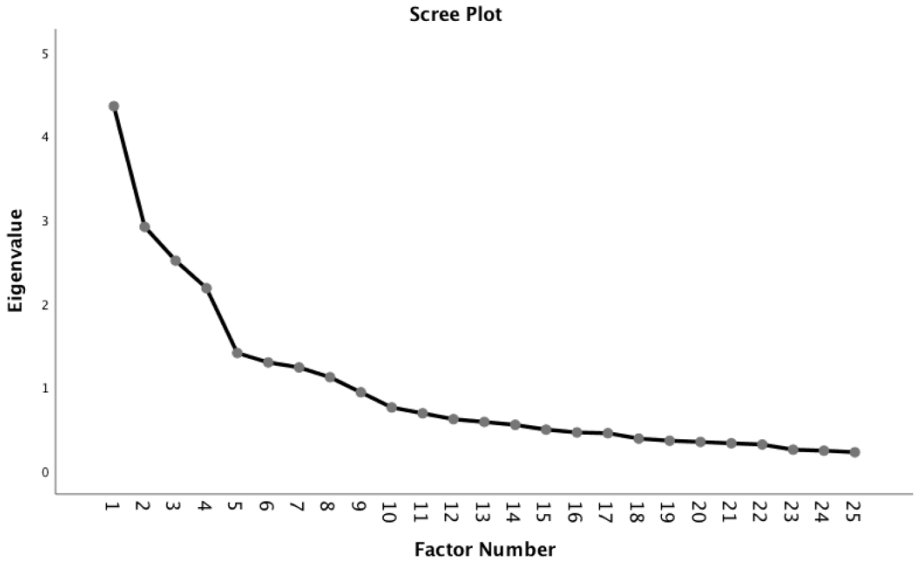

Figure 3-1: Scree Plot indicating an 8-factor solution

Table 3-3: Rotated Factor Loadings for Relational Expectations and Beliefs

Relational Expectations

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
I do not want to be monogamous because it means I would have to commit to only one person	.707							
I would want to be in a relationship where I'm allowed to date other people	.699							
Committing to a serious relationship right now would keep me from enjoying my life	.611							
I would date someone who is into party-and-play (PnP)	.595							

Table 3-3 Continued

The thought of making a long term emotional commitment to a romantic partner is scary	.526		
It is acceptable for my partner to use drugs	.513		
I would be willing to have an intense but short relationship	.469		
My self-esteem goes down when a partner breaks up with me		.833	
I feel powerless when a partner breaks up with me		.831	
Breakups tend to affect my day-to-day activities negatively		.806	
I tend to blame myself for my breakups		.616	
I only want to date men who are masculine			.815
I only want to date men who are “straight- acting”			.735
I would date an effeminate man*			.730

Table 3-3 Continued

I would date a man who does drag*	.538				
When a relationship ends, I ultimately leave with a better sense of what I desire in a future relationship		.879			
When a relationship ends, I ultimately leave with a better sense of what I can offer in a future relationship		.817			
If I cheated on my partner I would expect him to break up with me			.805		
If my partner cheated on me, I would break up with him			.751		
I tend to know that I'm in love with someone within the first month of dating				.771	
I tend to tell someone that I love him within the first month of dating				.666	
My partner must have a close relationship with my family					.714
My partner must have a close relationship with my friends					.625

Table 3-3 Continued				
My partners political views must compliment mine				.714
My partners religious views must compliment mine				.674
Relational Beliefs				
Items	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**
Sex is important for a lasting romantic relationship	.792			
Sex brings two people closer	.743			
Sexual chemistry is important in a romantic relationship	.667			
I admire romantic relationships where partners seem to be equals		.792		
I most admire relationships where couples are on the same wavelength		.708		
I have difficulty identifying non-heterosexual couples whose relationships I admire			.553	
There are few gay couples whose romantic relationships I can use as a model in my own life			.470	

Table 3-3 Continued		
It is hard to develop a romantic relationship with a man if you have sex with him soon after you start dating	.443	
The purpose of a romantic relationship is building a commitment that will last forever		.638
Expecting a romantic relationship to last forever is unrealistic*		.558

*Items were reverse coded

Confirmatory Factor Analysis

After completing the EFA, we then used the second sub-sample of participants (N=702) to confirm factors. We applied principal axis factoring with varimax rotation the CFA sample and found eight factors within relational expectations and four factors within relational beliefs. CFA also confirmed similar factor loadings found in EFA, with the exception of one item "Expecting a romantic relationship to last forever is unrealistic," which cross-loaded; however cross-loading was not above 0.5 (Costello & Osborne, 2005). The KMO indicated in the CFA for relational expectations were .768, while the KMO for relational beliefs was .619; both indicated acceptability for factor analysis ("Kaiser-Meyer-Olkin value (KMO value)," 2007). The table for confirmatory factor analysis can be found in Table 3-4.

Following CFA with the second sub-sample (N=702), we then performed CFA with the full sample of participants (N=1,582). Utilizing the full sample of participants, we performed principal axis factoring with varimax rotation on factors with a Cronbach's alpha above 0.7. We

confirmed six factors for relational expectations and two factors for relational beliefs. Rotated factor loadings were similar in the full sample in comparison to the EFA and CFA half-sample with the exception of one item "I would date a man who does drag" which cross-loaded onto another factor; however, cross-loading was not above 0.5 (Costello & Osborne, 2005). KMO for relational expectations were .764 and .654 for relational beliefs, indicating acceptable factor analysis sampling adequacy. Factor loadings for the full sample can be found in Table 3-5.

Table 3-4: Confirmatory Analysis: Rotated Factor Loadings for Relational Expectations and Beliefs

Relational Expectations

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
I do not want to be monogamous because it means I would have to commit to only one person	.734							
I would want to be in a relationship where I'm allowed to date other people	.711							
Committing to a serious relationship right now would keep me from enjoying my life	.621							
I would date someone who is into party-and-play (PnP)	.614							
The thought of making a long term emotional commitment to a romantic partner is scary	.532							

Table 3-4 Continued

It is acceptable for my partner to use drugs	.499			
I would be willing to have an intense but short relationship	.499			
My self-esteem goes down when a partner breaks up with me		.866		
I feel powerless when a partner breaks up with me		.801		
Breakups tend to affect my day-to-day activities negatively		.794		
I tend to blame myself for my breakups		.559		
I only want to date men who are masculine			.837	
I only want to date men who are "straight- acting"			.770	
I would date an effeminate man*			.675	
I would date a man who does drag*			.450	
When a relationship ends, I ultimately leave with a better sense of what I desire in a future relationship				.898

Table 3-4 Continued

When a relationship ends, I ultimately leave with a better sense of what I can offer in a future relationship	.817				
If I cheated on my partner I would expect him to break up with me		.809			
If my partner cheated on me, I would break up with him		.720			
I tend to know that I'm in love with someone within the first month of dating			.742		
I tend to tell someone that I love him within the first month of dating			.673		
My partner must have a close relationship with my family				.739	
My partner must have a close relationship with my friends				.644	
My partners political views must compliment mine					.630
My partners religious views must compliment mine					.559

Table 3-4 Continued

Relational Beliefs				
Items	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**
Sex is important for a lasting romantic relationship	.803			
Sex brings two people closer	.695			
Sexual chemistry is important in a romantic relationship	.660			
I admire romantic relationships where partners seem to be equals		.748		
I most admire relationships where couples are on the same wavelength		.703		
I have difficulty identifying non-heterosexual couples whose relationships I admire			.672	
There are few gay couples whose romantic relationships I can use as a model in my own life			.468	
It is hard to develop a romantic relationship with a man if you have sex with him soon after you start dating			.464	

Table 3-4 Continued

The purpose of a romantic relationship is building a commitment that will last forever	.845
Expecting a romantic relationship to last forever is unrealistic*	.413

*Items were reverse coded

Table 3-5: Full Sample Rotated Factor Loadings for Relational Expectations and Beliefs

Relational Expectations

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
I do not want to be monogamous because it means I would have to commit to only one person	.738					
I would want to be in a relationship where I'm allowed to date other people	.726					
I would date someone who is into party-and-play (PnP)	.589					
Committing to a serious relationship right now would keep me from enjoying my life	.583					
It is acceptable for my partner to use drugs	.545					
The thought of making a long term emotional commitment to a romantic partner is scary	.536					

Table 3-5 Continued

I would be willing to have an intense but short relationship	.478			
I feel powerless when a partner breaks up with me		.848		
My self-esteem goes down when a partner breaks up with me		.819		
Breakups tend to affect my day-to-day activities negatively		.803		
I tend to blame myself for my breakups		.587		
I only want to date men who are masculine			.824	
I only want to date men who are “straight- acting”			.754	
I would date an effeminate man*			.707	
I would date a man who does drag*			.505	
When a relationship ends, I ultimately leave with a better sense of what I desire in a future relationship				.875
When a relationship ends, I ultimately leave with a better sense of what I can offer in a future relationship				.836

Table 3-5 Continued

If I cheated on my partner I would expect him to break up with me		.807	
If my partner cheated on me, I would break up with him		.745	
I tend to know that I'm in love with someone within the first month of dating			.764
I tend to tell someone that I love him within the first month of dating			.680
Relational Beliefs			
	Factor 1	**Factor 2**	
Sex is important for a lasting romantic relationship	.790		
Sex brings two people closer	.727		
Sexual chemistry is important in a romantic relationship	.659		
I admire romantic relationships where partners seem to be equals		.817	
I most admire relationships where couples are on the same wavelength		.685	

*Items were reverse coded

Final Subscales

Following CFA, we finalized the six subscales of relational expectation and two subscales for relational beliefs. With the relational expectation subscales, we created mean composite scales

to create a score out of 5 points. A lower score indicated weaker expectations, and higher scores indicated stronger expectations. For example, in the negative breakup subscale, a score of 1 indicates weaker expectations from a negative breakup, and a score of 5 indicates stronger expectations from a negative breakup.

Similarly, the relational belief subscales were totaled and averaged to mean composite score out of 4 points. Lower scores indicated weaker importance of beliefs, and higher scores indicated stronger importance of beliefs. For example, from sex beliefs subscale, a score of 1 would indicate weaker importance of sex in a relationship, and a score of 4 would indicate greater importance of sex.

All subscales have a Cronbach's alpha above 0.7, and mean scores were calculated for each item, and each subscale (See Table 3-6). Lastly, we tested for multicollinearity using Pearsons correlation between each subscale. We found that multicollinearity was not an issue between the subscales (See Table 3-7). We have included a conceptual model of the finalized subscales and their components in Appendix C & D.

Table 3-6: Full Sample Subscales and Mean Scores

Items	M (SD)
Restrictions (α: 0.790)	**Total: 1.95 (0.79)**
I do not want to be monogamous because it means I would have to commit to only one person	1.64 (1.095)
I would want to be in a relationship where I'm allowed to date other people	1.47 (0.982)
Committing to a serious relationship right now would keep me from enjoying my life	1.83 (1.198)
I would date someone who is into party-and-play (PnP)	1.79 (1.156)
The thought of making a long term emotional commitment to a romantic partner is scary	2.43 (1.288)
It is acceptable for my partner to use drugs	2.10 (1.281)
I would be willing to have an intense but short relationship	2.55 (1.343)
Negative Breakups (α: 0.855)	**Total: 2.84 (1.06)**
My self-esteem goes down when a partner breaks up with me	3.22 (1.435)
I feel powerless when a partner breaks up with me	2.72 (1.450)
Breakups tend to affect my day-to-day activities negatively	2.85 (1.370)
I tend to blame myself for my breakups	2.75 (1.387)
Masculine and Gender Norms (α: 0.771)	**Total 3.08 (1.04)**
I only want to date men who are masculine	2.80 (1.393)
I only want to date men who are "straight- acting"	2.48 (1.358)
I would date an effeminate man	3.26 (1.330)
I would date a man who does drag	3.87 (1.328)
Optimism (α: 0.856)	**Total: 3.54 (1.10)**
When a relationship ends, I ultimately leave with a better sense of what I desire in a future relationship	3.62 (1.17)

Table 3-6 Continued	
When a relationship ends, I ultimately leave with a better sense of what I can offer in a future relationship	3.50 (1.18)
Cheating (α: 0.769)	**Total: 3.79 (1.13)**
If I cheated on my partner, I would expect him to break up with me	3.97 (1.18)
If my partner cheated on me, I would break up with him	2.48 (1.32)
Immediacy (α: 0.741)	**Total: 2.18 (1.14)**
I tend to tell someone that I love him with someone within the first month of dating	2.48 (1.32)
I tend to know when I'm in love with someone within the first month of dating	1.92 (1.24)
Sex Beliefs (α: 0.773)	**Total: 3.20 (0.61)**
Sex is important for a lasting romantic relationship	3.13 (.805)
Sex brings two people closer	3.19 (.729)
Sexual chemistry is important in a romantic relationship	3.31 (.650)
Equality (α: 0.727)	**Total: 3.44 (0.55)**
I admire romantic relationships where partners seem to be equals	3.48 (.608)
I most admire relationships where couples are on the same wavelength	3.44 (.607)

Table 3-7: Pearsons Correlation Matrix between Relational Expectations and Belief subscales

	Relational Expectations					
	Restrictions	**Negative Breakup**	**Masculine & Gender Norms**	**Optimism**	**Cheating**	**Immediacy**
Negative Break Up	.124***					
Masculine & Gender Norms	-.058**	-.056**				
Optimism	.054*	.044†	-.018			
Cheating	-.157**	.126**	.044†	.204**		
Immediacy	.253**	.322**	-.032	.043†	.002	
			Relational Beliefs			
	Sex Beliefs	**Equality**				
Equality	.188***					

† *<0.10*; ***<0.05; ** <0.01*

3.4 DISCUSSION

Current understanding of GBM's romantic relationship beliefs have not been fully explored. Our research contributes to fill this gap by presenting multi-dimensional constructs of relational cognitions specific to YGBM. We identified six constructs of relational expectations and two constructs of relational beliefs. These relational constructs demonstrate internal validity, consistency, and factor reliability. Our novel findings build on extant literature and shed light on differences and similarities in relational cognition among YGBM in comparison to heterosexual youth. Further exploring these constructs as they relate to health outcomes may also explain disparities, as well as, inform research and interventions to reduce disparities.

In comparison to prior attempts at operationalizing relational expectations and beliefs, our findings are unique in scope and content. While unique to YGBM, there were constructs which showed multi-faceted significance among previous scales and population groups. For example, beliefs about sex in a relationship and the construct of commitment identified in our measures have

previously been identified in past scales of romantic love (José A. Bauermeister, 2015). Additionally, the construct of immediacy showed multi-faceted significance in different population groups (partnered heterosexual individuals) (Vannier & O'Sullivan, 2018) and in aspects of romantic obsession among YGBM (José A. Bauermeister, 2015). Using a sample of heterosexual and sexual minority female and male adolescents, Diamond and Lucas (2004) operationalized romantic expectations as romantic fear and romantic control. These constructs may be related to aspects we identified, such as our construct of optimism as it relates to control, and our construct of negative break ups as it relates to fear (L. M. Diamond & Lucas, 2004). Our research builds on existing literature by operationalizing relational beliefs and expectations specific to YGBM. Moreover, utilizing a SCT framework enhances our findings and provide validity and specificity as they account for YGBM developmental experiences as they can influence relational cognitions. Our unique contribution to the literature is exemplified in previously unexplored dimensions related to relational cognitions among YGBM, such as party-and-play, masculine gender norms, and equality within same-sex relationships. These nuanced findings illustrate the importance of taking into account developmental differences between YGBM and their heterosexual peers. We urge future research among YGBM apply a SCT when applicable to advance research among this marginalized population.

During factor analysis, many of our hypothesized factors were either renamed or dropped, increasing parsimony among our items. For example, the factor we identified as monogamy was renamed to cheating, as items either loaded onto other factors ("I would want to be in a relationship where I'm allowed to date other people" loaded onto the restrictions factor) or were dropped during analysis. Once we removed these items, the factor became specific to cheating. We also found that some items which related to aspects of emotional intimacy and security had poor factor loadings

are were not kept (e.g., “I know I am in love if my partner and I can easily read each other’s emotions” and “A serious relationship makes me feel emotionally secure”). However, the aspect of emotional commitment was kept, but loaded onto our restrictions construct (“Committing to a serious relationship right now would keep me from enjoying my life”). Previous research has explored emotion intimacy among dyadic same-sex couples, with association to minority stress and relationship satisfaction. The authors indicate the importance of emotional intimacy as a mediator between minority stress and relationship satisfaction (Guschlbauer, Smith, DeStefano, & Soltis, 2019). Thus, we recommend future research to continue to explore operationalizing emotional intimacy expectations among YGBM.

Many items that we thought would load onto our hypothesized factors of passion, and lifestyle factors, loaded together on a broader factor we named restrictions. The significance of restrictions is supported by Sullivan and colleagues (2017) who found some YGBM prefer exploration and undefined relationships in order to keep or pursue other relationships (S. P. Sullivan, E. S. Pingel, R. Stephenson, & J. A. Bauermeister, 2018). These findings relate to items within the restriction factor such as, “Committing to a serious relationship right now would keep me from enjoying my life.” Two items within the restriction factor relate to drug use, “It is acceptable for my partner to use drugs” and “I would date someone who is into party-and-play (PnP).” Previous literature has noted drug use as a factor in sexual partnerships among YGBM, and have found associations between drug use and relationship characteristics such as commitment among partnered gay and bisexual adult men (Mitchell, 2016; Newcomb & Mustanski, 2014). Our research indicates that acceptability of drug use in romantic relationships is a significant factor in defining romantic relationship boundaries. However, our sample included participants between 18

and 24 when alcohol use and drug use may be more prevalent than later adulthood (Green & Feinstein, 2012).

Specific to relational beliefs, our hypothesized constructs of sex and equality were consistent to our findings, while constructs of development and permanence were redefined as modeling, and happily ever after. These constructs have been explored in previous literature, though not among YGBM (Kuo et al., 2017; Luttrell, Distelberg, Wilson, Knudson-Martin, & Moline, 2018; Sprecher & Metts, 1989; Vannier & O'Sullivan, 2017; Young & Schrodt, 2016). Literature among sexual minority youth illustrates the lack of potential role models or examples in modeling romantic relationships, and the difficulties youth may have in navigating these new experiences (Greene et al., 2015). Similarly, the construct of happily ever after has been examined in other populations as it relates to cognitions of "true love" and "soul mates", yet this construct has not been explicitly explored among YGBM. Although the factors of modeling and happily ever after were removed due to poor reliability, we support future research that explores these constructs among YGBM in comparison to heterosexual youth to assess potential cognitive differences.

Applying these nuanced findings, we implore researchers to explore underlying constructs within subscales. For example, the construct of negative break ups may also have underlying constructs of vulnerability, negative rumination, guilt, and self-deprecation. Additionally, the measure of cheating may also capture constructs of intimacy, commitment, and monogamy. A deeper understanding of these relational constructs may be beneficial in bridging these previously unmeasured constructs to existing literature and public health outcomes. See Appendix C & D for our conceptual model of final constructs.

Our study includes several strengths and limitations. First, participants were recruited as a convenience sample with no population frames. Thus, racial/ethnic minority YGBM were not equally represented. Next steps in this research will be to explore these scales among varying ethnic and economic groups. Although our findings relevant for bisexual men, our study question only asked about same-sex relational cognitions and did not account for opposite sex relationships. Next steps in this research could explore how relational cognitions may be similar or different among bisexual individuals with different relationship types. Additionally, the cross-sectional nature of the Virtual Love Study may limit our understanding of relational cognitions, as cognitions may change over time. Future research should address this limitation with longitudinal research on relational cognitions. Theoretically, our study acknowledged minority stress as relevant for YGBM cognitions, however, we did not measure direct experiences of discrimination or internalized homonegativity. Future research should assess how experiences of discrimination or internalized homonegativity affect relational cognitions and outcomes of mental health more directly. Moreover, our study was able to identify and confirm a limited number of factors, yet more relational constructs may exist. Based on our findings, we wish to validate more items to factors that had less than three items to improve reliability and validity. Furthermore, our study treated relational beliefs and expectations separately as a first step to identify constructs from each larger construct. Next steps in this research could apply structural equation modeling to explore how beliefs and expectations inform each other or overlap. Despite these limitations, our relational expectation and belief items were developed from qualitative interviews with YGBM, which increases the content validity of our measures. Additionally, our national sample used online recruitment and large sample sizes to improve the generalizability of our findings. Furthermore,

our research was the first to develop relational subscales specific to YGBM, and our SCT framework is a strength which separates our work from existing literature.

Collectively, this research has the capacity to inform cognitive and behavioral public health interventions among single and partnered YGBM across the life course. Although our analysis is focused on single YGBM, our findings may also be useful for partnered YGBM as relational cognitions do not dissipate in relationships, in effect, they become more informed. Interventions focused on promoting healthy relational cognitions may be beneficial in countering negative experiences that may mark relational cognitions and may help normalize same-sex relationships and acceptability. The importance of an intervention like this is especially relevant as discussions about same-sex romance and especially sex may be ignored in school and other social contexts, leaving YGBM not only uninformed but more vulnerable to sexual risk (Greene et al., 2015). Moreover, given that YGBM may lack romantic role models, interventions that focus on relationship functioning, communication and mediation skills, coping, and other important interpersonal skills may be helpful in building strong future relationships. Given the potential protective aspect of romantic relationships (Wienke & Hill, 2009), public health interventions can foster safe environments for same-sex relationships to grow. The impact of interventions like these is significant as it focuses on romantic relationships as a natural resilience among YGBM. Taken together, our research has broad implications for practical interventions to better support YGBM. Our novel findings signal the importance of relational cognitions among YGBM and lays groundwork for future quantitative exploration to test these subscales on health outcomes specific to YGBM.

4.0 TESTING RELATIONAL BELIEFS AND EXPECTATIONS ON HIV RISK AMONG YOUNG GAY AND BISEXUAL MEN

Jordan Sang, MPH

Department of Behavioral and Community Health Sciences

Graduate School of Public Health, University of Pittsburgh

4.1 INTRODUCTION

The HIV epidemic in the United States continues to disproportionately affect gay and bisexual men (GBM). Specifically, young gay and bisexual men (YGBM) have the greatest risk of infection among men, with YGBM men aged 13-34 accounting for 64% of new diagnoses in 2016 (Centers for Disease Control and Prevention, 2018). Rates of HIV incidence among YGBM have increased greater than other age groups of GBM, and from 2008 to 2011 this population had the greatest increase (26%) in HIV diagnoses among GBM (Centers for Disease Control and Prevention, 2017). These alarming rates among YGBM may be partially explained due to the transitionary period of time from adolescence to adulthood, and the shifts in HIV risk related to behaviors. For example, YGBM may be more likely to engage in illicit drug use, alcohol misuse, condomless sex, and number of sexual partners, all of which may increase risk of HIV (Halkitis et al., 2014; Wong, Schrager, Chou, Weiss, & Kipke, 2013). These behavioral risks are coupled with structural barriers for YGBM such as lack of comprehensive HIV services, lack of HIV knowledgeable service providers, geography, and HIV stigma (Beach et al., 2018). Together these

findings are a call to action for public health researchers to explore innovative approaches to curb this persistent epidemic

Recent evidence of transmission rates for GBM suggest that 68% of new infections occur within the context of a serious relationship, and among YGBM aged 18-24, this estimate increases to 79% (P. Sullivan et al., 2009). Romantic relationships play a significant role in HIV transmission as relationship components may influence decision making regarding prevention (Brian Mustanski et al., 2011). Longitudinal data indicate that most YGBM report at least one serious relationship in the past 18-months, with many reporting three or more (Brian Mustanski et al., 2011). Based on data generated by 20 YGBM couples, Greene et al. (2014) found that condom non-use was negatively associated with emotional intimacy, perceptions of monogamy, and difficulty obtaining or using condoms (Greene et al., 2014). Previous data have demonstrated that rates of condomless sex increase with familiar, known partners, while men with less familiar partners have low rates of condomless sex (Newcomb & Mustanski, 2016; Newcomb et al., 2014). Moreover, YGBM are likely to classify their relationship as serious after six-months. Previous research among GBM has suggested that connotations of a serious relationship is associated with beliefs about trust, familiarity, perceptions that partners wanted condomless sex, and perceptions about condoms interfering with intimacy (Davidovich, De Wit, & Stroebe, 2004). Risk may be further heightened among YGBM, due to higher rates of primary partner turnover and the associations between primary partners and condomless sex (Brian Mustanski et al., 2011). Moreover, YGBM may not have discussions about HIV status, instead relying on perceptions of trust and monogamy (Greene et al., 2014). These findings coupled with low rates of HIV testing among YGBM may increase vulnerability for HIV risk among YGBM (Phillips, Ybarra, Prescott, Parsons, & Mustanski, 2015). Taken together, the extant literature highlights the need for research

on romantic relationships among YGBM, yet interventions focused at the dyadic-level require a clearer understanding of how YGBM conceptualize their relationships.

Romantic relationships are informed by relational beliefs and expectations, which influence relationship forming and functioning (Hefner & Kahn, 2014; Sprecher & Metts, 1999; Vannier & O'Sullivan, 2017). We define relational beliefs as generalized ideas, attitudes, and views about how a romantic relationship should be, which are informed by observational learning from the social environment; these may or may not be linked to behaviors. Relational expectations are defined as hopes, desires, or fears about romantic relationships which are consequence of beliefs (what people think is going to happen based on what they do). Relational expectations are related to relational beliefs, but expectations occur when an individual links a belief to behavior in hopes of achieving an outcome. Wigfield & Eccles (2000) argue that while beliefs and expectations are highly related empirically and load together in factor analyses, these constructs are theoretically distinct (Wigfield & Eccles, 2000). Thus, we follow this distinction in our research as the implications of beliefs and expectations vary. The importance of relational cognitions has been explored among heterosexual individuals and dyads, and more recently have included cognitions among YGBM (Cook et al., 2018).

Existing literature among single YGBM have examined different aspects of romantic beliefs on outcomes of condomless anal sex. For example, Bauermeister et al. (2012) explored the paradoxical beliefs of romantic obsession (related to dependence, insecurity and doubt) and romantic ideation (characterizing ideal future relationships) among YGBM and found ideation had a protective association with partners for condomless anal sex, whereas obsession was linked to increased risk of partners for condomless anal sex (José A. Bauermeister et al., 2012). Conceptualizing romantic obsession and ideation, these constructs are associated to relational

expectations but are framed within themes of obsession and ideation. Furthermore, Bauermeister (2012) used Sternberg's Triadic Love Scale (TLS) consisting of constructs of intimacy, passion, and commitment on a sample of single YGBM and found beliefs of commitment had a protective effect for condomless anal sex among YGBM (José A. Bauermeister, 2012). Associated with relational beliefs, the TLS measures aspects of love, which is a significant component in romantic relationships. Most recently, Cook et al. (2018) explored romantic cognitions and HIV risk using a longitudinal sample of YGBM with measures of romantic fears (fear about not being in a romantic relationship) and romantic control (perceived control of relationship functioning) in a relationship (Cook et al., 2018; L. M. Diamond & Lucas, 2004). These constructs are related to specific aspects of relational expectations (control and fear). The authors reported greater romantic fear was associated with increased receptive condomless anal sex, while greater perceived control in a romantic relationship was associated with increased condomless receptive and insertive condomless anal sex. These researchers hypothesize that YGBM who endorse perceptions of romantic control may also possess greater feelings of empowerment and the ability to use (or not use) condoms. Taken together, extent literature present evidence for the association between broader romantic and relational cognitions and HIV risk among YGBM. Moreover, these findings highlight the association between beliefs and expectations on outcomes of behavioral risk.

Current Study

Considering the importance and impact of relational cognitions on HIV prevention, our study seeks to better understand how relational beliefs and expectations relate to HIV risk among YGBM. Utilizing multi-dimensional subscales developed to measure relational beliefs and expectations specific to YGBM, our study's main goal was to test associations between these relational subscales on outcomes of condomless insertive and receptive anal sex. Our first

objective was to test associations between relational beliefs and expectations on outcomes of number of partners for receptive condomless anal sex. Our second objective was to test associations between relational beliefs and expectations on outcomes of number of partners for insertive condomless anal sex. Relational expectation subscales measure: relationship restrictions, negative breakups, optimism, cheating, masculine and gender norms, and immediacy. Relational belief subscales measure: sex beliefs and relationship equality.

These subscales were developed from qualitative interviews among YGBM and validated using factor analysis, and demonstrated internal validity, consistency, and factor reliability. We hypothesize that greater endorsement of relational constructs of restrictions, optimism, cheating, and equality will be associated with lower odds of both insertive and receptive condomless anal sex. Additionally, we hypothesize that greater endorsement of constructs on masculine and gender norms, negative break ups, immediacy, and sex beliefs will be associated with higher odds for both insertive and receptive condomless anal sex. The contribution of our findings may provide insight in bolstering HIV prevention interventions among YGBM by better understanding how relational beliefs and expectations relate to condomless anal sex and HIV risk.

4.2 METHODS

Design

Data comes from the Virtual Love Study, an online observational cross-sectional study that examined YGBM's online dating experiences. The study ran from July 2012 until January 2013, and had an analytic sample of 1,582 YGBM. (José A. Bauermeister et al., 2011)

Recruitment and Eligibility

To be eligible, participants had to be between 18 to 24 years old and report being single, having used a dating website in the past three months, and having engaged sexual activity with a male partner that they met online in the past six months. Participants were recruited through advertisements on two popular social networking sites, through participant referrals, and by way of flyers posted at local venues commonly frequented by YGBM. Online ads were targeted to men living in the United States in the specific age range for the study. Promotional flyers included information about the incentive and eligibility criteria, and provided the survey website. The final sample included participants from 44 out of 50 states and Puerto Rico.

Data Collection

Once a potential participant entered the survey site they were asked for their email to serve as their username. This allowed participants to save answers and provided a way that they could exit the survey and come back later, if needed. Participants then completed eligibility screeners and if inclusion criteria were met, participants were invited to complete consent forms. Next, consented participants completed an online questionnaire that assessed socio-demographic characteristics, Internet use, ideal relationship and partner characteristics, sexual behaviors, and psychosocial well-being. If participants did not complete the survey all at once, they were sent two reminder emails encouraging them to complete the survey. Participants received a $10 electronic gift card for completing the survey. All study procedures were approved by the University of Michigan Institutional Review Board. The University of Pittsburgh Institutional Review Board allowed the use of de-identified data for this analysis.

Measures

Sexual identity

Sexual identity was assessed with the question "If you had to select just one identity, which would most closely fit how you identify?" Responses were, Gay/Homosexual, Bisexual, Straight/heterosexual, Same gender loving, MSM, or Other. Heterosexual and Other identified participants were removed from analysis. The remaining responses were dichotomized, with one category comprised of gay/homosexual, same gender loving, and MSM responses and the other including bisexual responses.

Race/Ethnicity

Race was assessed with the question, "What is your race?" Participants could indicate any number of responses: White/Caucasian, Black/African American, Asian/Pacific Islander, Middle Eastern, Native American, and Other. Ethnicity was assessed with the question, "Are you Hispanic/ Latino?" Response options were "Yes" or "No." Due to small sample sizes for racial/ethnic minorities, we decided to dichotomize race/ethnicity into minority status. Participants who indicated that they were White/Caucasian only and who responded "No" to Hispanic/Latino were identified as White. Participants who indicated at least one race other than White or who indicated "Yes" to Hispanic/Latino, were identified as racial/ethnic minorities. This procedure is consistent with previous analyses of these items (José A. Bauermeister et al., 2012).

Educational Attainment

Education attainment was assessed with the question, "What is the highest level of education that you have completed?" Responses options were (1 = Less than high school, 2 = High school, 3 = Technical/Associate degree, 4 = Some College, 5 = College, 6 = Some Graduate

School, 7 = Graduate School). We treated this variable as continuous in our analyses, based on previous handling of this item (José A. Bauermeister et al., 2011).

Decisional Balance to Forego Condoms for Pleasure and Emotional Connection

The Decisional Balance to Forego Condoms for Pleasure and Emotional Connection scale was developed by Bauermeister and colleagues (2009) to assess participants' perceptions about condom use with partners and touches on aspects of intimacy associated with condom use during sex (Jose A. Bauermeister, Carballo-Dieguez, Ventuneac, & Dolezal, 2009). Participants were asked 7 questions twice. Each question asked about sex without/with condoms. Example questions include, "Sex without/with condoms makes me feel close to my partner" and "Sex without/with condoms is very intimate to me." Participants responded through a four-point scale ranging "Strongly disagree" (1) to "Strongly agree" (4). Scores were computed by summing the net difference between condomless anal sex and sex with condoms. Greater positive scores indicate greater benefits/gains associated with condomless sex. Negative scores indicate greater benefits/gains associated for sex with condoms (José A. Bauermeister et al., 2012). The Cronbach's alpha for the computed scores among our sample was 0.887, indicating high reliability.

Time spent online for dating/ hooking up

Prior to answering questions on Internet use for dating and hooking up, participants were given definitions for dating (i.e., getting to know another man for a potential romantic relationship) and hooking up (i.e., having a ''no strings attached'' sexual encounter with another man). These definitions were created from previous qualitative interviews conducted with YGBM. We then asked participants to describe how often they used the Internet to find someone to hook up or date, "During the past 2 months, how many times did you go online to hookup?" and "During the past 2 months, how many times did you go online to find someone to date?" Treating hooking up and

dating separately is important because of different risks associated with different partner seeking behaviors (José A. Bauermeister et al., 2011). Responses ranged from 0= "Never" to 7= "More than once a day". Consistent with prior operationalization of these questions and given few responses in some cells, we recoded responses to a 4-point scale, to maximize interpretation. Responses were 0 = Never, 1 = Rarely (Once a month or less), 2 = Sometimes (2–3 times a month), and 3 = Often (Once a week or more/2–6 times a week/About once a day/More than once a day) (José A. Bauermeister et al., 2011).

Serious Relationship with a man

We asked participants if they have ever had experience being in a serious relationship with another man: "How many serious relationships (lasting more than 3 months) have you had with men?" Participant were asked to enter a number.

Relational Expectation Subscales

Relational Restrictions

The relational restrictions subscale consists of seven-items that ask participants their opinion about possible restrictions within a romantic relationship. Example questions include, "Committing to a serious relationship right now would keep me from enjoying my life," "It is acceptable for my partner to use drugs," and "I would be willing to have an intense but short relationship." Participants responded through a five-point scale ranging from "Not True" (1) to "Very True" (5). All items in this scale were reverse coded for ease of interpretation. Finals scores were added together and averaged to create a score out of 5. Higher scores indicate desire for more restrictions in a relationship and lower scores indicate lower desire for restrictions in relationships. The Cronbach's alpha for this scale among our sample was 0.790, indicating high reliability.

Negative Break Ups

The negative break ups subscale consists of four-items that ask participants how much they think a break up would affect them. An example question is, "I feel powerless when a partner breaks up with me." Participants responded through a five-point scale ranging from "Not True" (1) to "Very True" (5). Finals scores were added together and averaged to create a score out of 5. Higher scores indicate greater perceptions about negative breakups and lower score indicate lower perceptions of break ups. The Cronbach's alpha for this scale among our sample was 0.855, indicating high reliability.

Masculine and Gender Norms

The masculine and gender norms subscale consists of four-items that ask participants about their expectations of masculine and gender norms in their partner. Example questions include, "I only want to date men who are masculine." Two-items were reverse coded: "I would date a man who does drag" and "I would date an effeminate man." Participants responded through a five-point scale ranging from "Not True" (1) to "Very True" (5). Finals scores were added together and averaged to create a score out of 5. Higher scores indicate greater endorsement of masculine and gender norms in a relationship and lower scores indicate a lower endorsement. The Cronbach's alpha for this scale among our sample was 0.771, indicating high reliability.

Optimism

The optimism subscale consists of two-items that ask participants their perceptions about optimism after a break up. An example question is, "When a relationship ends, I ultimately leave with a better sense of what I desire in a future relationship." Participants responded through a five-point scale ranging from "Not True" (1) to "Very True" (5). Finals scores were added together and averaged to create a score out of 5. Higher scores indicate greater expectations of optimism after

a break up and lower scores indicate lower expectations of optimism. The Cronbach's alpha for this scale among our sample was 0.856, indicating high reliability.

Cheating

The cheating subscale consists of two-items that ask participants how they expect to react to cheating in a relationship. The concept of cheating was left open-ended and not defined to include specific aspects of cheating. An example question is, "If I cheated on my partner, I would expect him to break up with me." Participants responded through a five-point scale ranging from "Not True" (1) to "Very True." (5). Finals scores were added together and averaged to create a score out of 5. Higher scores indicate stronger reactions to cheating, and lower scores indicate lower reactions to cheating. The Cronbach's alpha for this scale among our sample was 0.769, indicating high reliability.

Immediacy

The immediacy subscale consists of two-items that ask participants how quickly they would expect to develop and express love within a relationship. An example question is, "I tend to tell someone that I love him within the first month of dating." Participants responded through a five-point scale ranging from "Not True" (1) to "Very True" (5) Finals scores were added together and averaged to create a score out of 5. Higher scores indicate quicker expectations of love and lower scores indicate slower expectations of love. The Cronbach's alpha for this scale among our sample was 0.741, indicating high reliability.

Relational Belief Subscales

Sex Beliefs

The sex beliefs subscale consists of three-items that ask participants their perceptions about the role and importance of sex in a romantic relationship. An example question is "Sex brings two

people closer together." Participants responded through a four-point scale ranging "Strongly disagree" (1) to "Strongly agree" (4) Finals scores were added together and averaged to create a score out of 4. Higher scores indicate greater beliefs about the importance of sex within a romantic relationship and lower scores indicate lower beliefs about the importance of sex. The Cronbach's alpha for this scale among our sample was 0.773, indicating high reliability.

Equality

The equality subscale consists of two-items that ask participants about their beliefs in equality within a romantic relationship. Participants responded through a four-point scale ranging "Strongly agree" (1) to "Strongly disagree" (4). Finals scores were added together and averaged to create a score out of 4. Higher scores indicate greater beliefs about equality within a relationship and lower scores indicate lower beliefs about equality in relationships. The Cronbach's alpha for this scale among our sample was 0.727, indicating high reliability.

Condomless Anal Sex

We asked participants how many men they engaged in insertive or receptive condomless anal sex in the past two months. Questions were asked both in formal language and in vernacular, to improve comprehension. Questions included: "How many men put their penises in your rectum without a condom?" ("How many men fucked you in the ass without a condom?") and "Into how many men's rectums did you put your penis without a condom?" (How many men did you fuck in the ass without a condom?"). Responses were recorded as counts.

Analytic Procedures

We conducted Pearson's chi-square to examine categorical variables and t-tests to examine continuous variables between participants who were sexually active and not sexually active. For non-normally distributed items, we used Mann-Whitney Test. (See Table 4-1). Given our outcome

of interest is condomless anal sex (CAS), we first stratified our sample to only participants who indicated that they have been sexually active in the past two months (N=1,154), we next stratified to participants who indicated they had ever engaged in I-CAS (N=346) and R-CAS (N=410). We found 20 participants had missing data on a few relational expectation items and covariates. We performed Mann-Whitney test between participants with missing data and our final samples. We found significant differences between the I-CAS sample and missing participants for one variable: decisional balance to forego condoms. We found two significant differences between participants with missing data and our final R-CAS sample: expectations of restrictions and masculine and gender norms. We address these as limitations in our discussion and include Figure 1 for clarity.

We conducted bivariate correlations between variables of interest and our outcomes for sexually active participants (Table 4-2). We then built our Generalized Linear models to include significant variables from the bivariate analysis and also included our relational constructs, controlling for sexuality, education, minority status. Our analyses applied with multivariate Poisson regression as our outcomes of number of partners for CAS were count variables. We did two analyses with our participant groups who indicated that they had ever engaged in receptive (N=410) and ever engage in insertive (N=346) anal sex in the past two months for each respective model of number of partners for I-CAS and R-CAS. Adjusted odds ratio (aOR) and 95% confidence intervals are reported in our regressions, and significance tests were set at $p<.05$. All analyses were conducted using SPSS Software, version 24 (IBM Corp., Armonk, NY).

Figure 4-1.

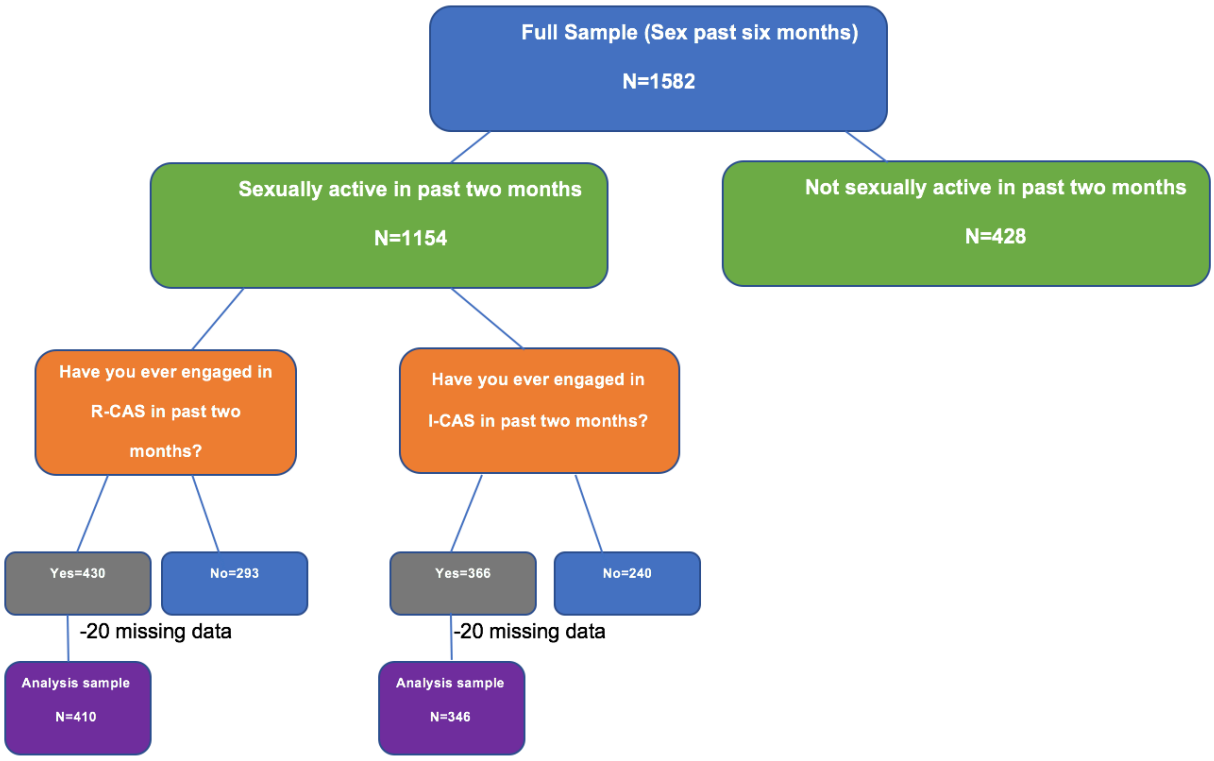

Figure 4-1: Analytical Sample of YGBM

Table 4-1: Testing Significant Differences between Sexually Active and Non-Sexually Active Participants

	Not Sexually Active (N=428)	**Sexually Active (N=1154)**	
Variable	**N (%)**	**N (%)**	**Sig.**
Sexual Orientation			.352
Gay/MSM	411(96%)	1119 (97%)	
Bisexual	17 (4%)	35 (3%)	
Race/Ethnicity			.641
White	341 (80%)	907 (79%)	
Non-White	87 (20%)	247 (21%)	
	M (SD)	**M (SD)**	**Sig.**
Age M(SD)	20.53 (1.89)	20.87 (1.90)	.002
Education M(SD)	5.16 (1.79)	5.38 (1.73)	.024
Online Hookup	1.72 (1.24)	2.93 (1.55)	p<.001
Online Dating	2.95 (1.60)	3.40 (1.52)	p<.001
Serious Relationship Experience	1.25 (1.54)	1.87 (1.82)	p<.001
Decisional Balance	-.19 (.99)	.04 (1.11)	p<.001
Relational Constructs			
Restrictions	4.14 (.75)	3.93 (.85)	p<.001
Negative Break Up	2.71 (1.06)	2.89 (1.05)	.003

Table 4-1 Continued

Masculine & Gender Norms	3.14 (.98)	3.06 (1.06)	.160
Optimism	3.36 (1.09)	3.61 (1.10)	p<.001
Cheating	3.89 (1.08)	3.75 (1.15)	.023
Immediacy	2.05 (1.10)	2.23 (1.15)	.005
Sex Beliefs	3.02 (.61)	3.26 (.59)	p<.001
Equality	3.45 (.54)	3.44 (.55)	.981

	Age	Ed	Sx	RE	SR	OD	OH	DB	Rest	Neg	M&G	Opt	Cheat	IM	Sex	Eq	I-CAS	R-CAS
Education (Ed)	.42**																	
Sexuality (Sx)	.00	.07**																
Race/Ethnicity (RE)	-.01	.06**	.09**															
Serious Relationship (SR)	.15**	.00	-.09**	-.042														
Online Dating (OD)	.14**	.08**	-.09	.03	.08**													
Online Hook Up (OH)	.10*	.05*	-.01	-.05*	.09**	.25**												
Decisional Balance (DB)	.05*	-.02	.00	.04	.10**	.03	.08**											
Restrictions (Rest)	.02	.02	.11**	.13*	-.04	.06**	-.25**	.04										
Negative Break Up (Neg)	-.06*	-.04	.01	-.04	.09**	.07**	.08**	.09**	-.11**									
Masculine & Gender Norms (M&G)	-.08	-.04	.03	-.07**	-.07*	-.01	-.03	.08*	.07**	-.05*								
Optimism (Opt)	.00	.04	.05*	-.02	.08**	.02	-.02	-.06*	-.06*	.04	-.01							
Cheating (Cheat)	-.10**	-.04	.02	-.05	.01	-.03	-.14**	-.08**	-.15**	.12**	.04	.20**						
Immediacy (IM)	.00	-.11**	-.03	-.06*	.09**	.10**	.11**	.01	-.25**	.32**	-.03	.04	.00					
Sex Beliefs (Sex)	.11**	.18**	.03*	.01	.04	.06*	.16**	.13**	-.10*	.09**	.03	.13**	-.01	-.00				
Equality (Eq)	-.00	.07**	.06*	.07**	-.03	-.00	-.06*	.00	.12**	.05*	-.003	.23**	.20**	-.01	.18**			
I-CAS	.08	-.05	-.02	-.04	.11*	.01	.11*	.10*	-.00	.00	.00	-.06	.00	.03	-.03	-.05		
R-CAS	.12*	-.03	.01	-.00	.20**	.01	.13*	.16**	-.00	.00	.00	.05	-.06	.09	.02	-.01	.55**	

*Note: ** significant at .01; * significant at .05*

Figure 4-2: Bivariate associations of variables among Sexually Active Participants

4.3 RESULTS

Table 4-2: Demographic information for sexually active YGBM (N=1,154)

	Sexually Active past two months (N=1,154)	Engaged in R-CAS (N=410)	Engaged in I-CAS (N=346)
		N (%)	
Sexual Orientation			
Gay	1119 (97%)	397 (97%)	330 95%)
Bisexual	35 (3%)	13 (3%)	16 (5%)
Minority Status			
White	748 (65%)	271 66%)	227 (66%)
Non-White	406 (35%)	139 (34%)	119 (34%)
		M (SD)	
Age	20.87 (1.90)	20.85 (1.97)	21.04 (1.91)
Educational Attainment [a]	5.38 (1.73)	5.23 (1.74)	5.32 (1.75)
Serious Relationship with a Man, No.	1.87 (1.82)	2.10 (1.80)	2.11 (1.92)
HIV Risk Factors			
Decisional Balance to Forego Condoms	.04 (1.11)	0.48 (0.99)	0.52 (0.91)
Time spent online for Dating	3.40 (1.52)	3.42 (1.50)	3.43 (1.52)
Time spent online for Hooking Up	2.93 (1.55)	3.03 (1.51)	3.08 (1.58)
Number of partners for receptive Condomless Anal Sex (R-CAS)	3.60 (10.94)	3.60 (11.14)	4.12 (14.11)
Number of partners for Insertive Condomless Anal Sex (I-CAS)	2.68 (5.89)	3.10 (7.30)	2.70 (6.03)
Relational Expectations [b]			
Romantic Restrictions	3.93 (.85)	4.02 (.70)	3.97 (0.73)
Negative Break Ups	2.89 (1.05)	2.94 (1.04)	2.97 (1.04)
Masc & Gender Norms	3.06 (1.06)	3.10 (1.05)	3.09 (1.06)
Optimism	3.61 (1.10)	3.56 (1.12)	3.58 (1.14)
Cheating	3.75 (1.15)	3.68 (1.19)	3.65 (1.18)
Immediacy	2.23 (1.15)	2.21 (1.12)	2.27 (1.11)
Relational Beliefs [c]			
Sex Beliefs	3.26 (.59)	3.24 (0.58)	3.32 (0.58)
Equality	3.44 (.55)	3.45 (0.55)	3.49 (0.57)

[a] *Educational attainment reference (1 = Less than high school, 2 = High school, 3 = Technical/Associate degree, 4 = Some College, 5 = College, 6 = Some Graduate School, 7 = Graduate School).*

[b] *(1=Not True, 2= A little true, 3= Somewhat True, 4=Pretty true, 5=Very True")*

[c] *(1=Strongly Disagree, 2= Disagree, 3=Agree, 4=Strongly Disagree)*

Sample Description

The average age for our sexually active sample was 20.87, with most participants having completed college (M=5.38). The majority of our sample self-identified as gay (97%), while 3% reported being bisexual. Moreover, most of the sample identified as white (65%), compared to 35% who identified as a racial/ethnic minority. On average, most participants reported two serious relationship experiences with another man and most participants reported using the Internet often to date (M=3.40, SD=1.52) or to hookup (M=2.93, SD=1.55). Participants also reported on average four instances of condomless receptive sex (M=3.60, SD=10.94) and three instances of condomless insertive anal sex (M=2.68, SD=5.89) in the past two months. Among our sexually active sample, most participants endorsed greater restrictions within their relationship (M=3.93, SD=.85), low expectations for immediacy in love (M=2.23, SD=1.15), and greater beliefs in equality within a romantic relationship (M=3.44, SD=.55). Full sample demographics can be found in Table 4-3.

Among our bivariate analyses, having a previous serious relationship with another man (r=.11), time spent online to hook up (r=.11), and a decisional balance to forego condoms (r=.10) were had a small positive association with I-CAS. On our outcome of R-CAS, age (r=.12) having experience being in a serious relationship with another man (r=.12), time spent online for hooking up(r=.13), and a decisional balance to forego condoms(r=.16), and I-CAS (r=.55) had a small positive association, with the exception of I-CAS, which had a large positive association. Full results can be found in Table 4-2.

Number of partners for Receptive Condomless Anal Sex (R-CAS)

The omnibus test for number of partners for R-CAS was significant (χ^2 (N = 411, df = 15) = 695.54, p<0.01). Age was positively associated with R-CAS (AOR=1.12; 95% CI: 1.09,

1.15), while educational attainment was negatively associated with R-CAS (AOR=0.86; 95% CI: 0.83, 0.89). Participants who identified as bisexual (AOR=0.45; 95% CI: 0.31, 0.66) had lower odds of R-CAS compared to participants who identified as gay. Also, participants who identified as a racial/ethnic minority (AOR=0.68; 95% CI: 0.60, 0.77) had lower odds of R-CAS compared to White participants. We also found that a decisional balance to forego condoms (AOR=1.37; 95% CI: 1.29, 1.45), increased time spent online to hook up (AOR=1.27; 95% CI: 1.22, 1.32), and having previous experience being in a serious relationship with another man (AOR=1.11; 95% CI: 1.09, 1.14) were positively associated with R-CAS.

Among relational expectation subscales, expectations of cheating were positively associated with R-CAS (AOR=1.20; 95% CI: 1.14, 1.26). Additionally, relational expectations of negative break ups (AOR=0.92; 95% CI: 0.87, 0.97), optimism (AOR=0.93; 95% CI: 0.88, 0.97), and immediacy (AOR=0.92; 95% CI: 0.88, 0.97), were negatively associated with R-CAS. The constructs of relationship restrictions (AOR=0.94; 95% CI: 0.87, 1.02) and masculine and gender norms (AOR=1.02; 95% CI: 0.97, 1.07) were not significantly associated with R-CAS. Among the relational belief subscales, sex beliefs (AOR=0.81; 95% CI: 0.74, 0.89), and beliefs about equality (AOR=0.74; 95% CI: 0.67, 0.82) were negatively associated with R-CAS.

Number of partners for Insertive Condomless Anal Sex (I-CAS)

The omnibus test for number of partners for I-CAS was significant (χ^2 (N = 348, df = 15) = 412.71, p<0.01). Age was positively associated with I-CAS (AOR=1.15; 95% CI: 1.11, 1.19), while educational attainment was negatively associated with I-CAS (AOR=0.89; 95% CI: 0.85, 0.93). We found that a decisional balance to forego condoms (AOR=1.36; 95% CI: 1.27, 1.47), increased time online to hook up (AOR=1.14; 95% CI: 1.09, 1.19), and having previous serious relationship experience (AOR=1.14; 95% CI: 1.22, 1.17) were positively associated with I-CAS.

Among the relational expectation subscales, expectations of optimism were positively associated with I-CAS (AOR=1.22; 95% CI: 1.15, 1.30). Expectations of negative break ups were negatively associated with I-CAS (AOR=0.91; 95% CI: 0.85, 0.97). Constructs of relationship restrictions (AOR=0.95; 95% CI: 0.86, 1.05), cheating (AOR=0.99; 95% CI: 0.94, 1.05), and immediacy (AOR=1.06; 95% CI: 1.00, 1.03), were not significantly associated with I-CAS. Among relational beliefs, sex beliefs (AOR=1.04; 95% CI: 0.91, 1.18), and equality (AOR=0.89; 95% CI: 0.78, 1.01) were not significantly associated with I-CAS. Full analyses can be found in Table 4-3.

Table 4-3: Poisson Regression of Relational Subscales and significant variables on Unprotected Anal Intercourse

	Total number of R-CAS partners (N=411)			**Total number of I-CAS partners (N=348)**		
	AOR	***Wald* χ^2**	**95% CI**	**AOR**	***Wald* χ^2**	**95% CI**
Age	1.12	61.09 **	(1.09, 1.15)	1.15	53.62 **	(1.11, 1.19)
Educational Attainment	0.86	73.22 **	(0.83, 0.89)	0.89	27.51 **	(0.85, 0.93)
Bisexual [a]	0.45	16.42**	(0.31, 0.66)	0.97	0.01	(0.68, 1.39)
Race/Ethnicity [b]	0.68	38.78 **	(0.60, 0.77)	0.96	0.26	(0.83, 1.11)
Decisional Balance	1.37	109.36 **	(1.29, 1.45)	1.36	70.17 **	(1.27, 1.47)
Online Hook up	1.27	153.04 **	(1.22, 1.32)	1.14	33.23 **	(1.09, 1.19)
Serious Relationship Experience	1.11	93.75 **	(1.09, 1.14)	1.14	98.62 **	(1.11, 1.17)
Relational Subscales						
Relationship Restrictions	0.94	1.73	(0.87, 1.02)	0.95	0.73	(0.86, 1.05)
Masc & Gender Norms	1.02	0.81	(.97, 1.07)	1.00	.001	(0.94, 1.06)
Negative Break Ups	0.92	8.65 **	(0.87, 0.97)	0.91	7.08 **	(0.85, 0.97)
Optimism	0.93	8.91 **	(0.88, 0.97)	1.22	41.81 **	(1.15, 1.30)
Cheating	1.20	52.25 **	(1.14, 1.26)	0.99	.003	(0.94, 1.05)
Immediacy	0.92	8.18 **	(0.88, 0.97)	1.06	3.79	(1.00, 1.13)
Sex Beliefs	0.81	19.16 **	(0.74, 0.89)	1.04	0.40	(0.91, 1.18)
Equality	0.74	31.60 **	(0.67, 0.82)	0.89	3.10	(0.78, 1.01)

[a] *Reference group is Gay*
[b] *Reference group is White*
***Significance <.001*

4.4 DISCUSSION

Overall, our findings support our hypothesis that relational beliefs and expectations are associated with condomless sex and HIV risk among YGBM. Expectations of negative break ups was the only relational construct to be significant for both R-CAS and I-CAS in the same direction, signaling its importance as a factor in HIV prevention. Our findings indicate that YGBM with greater expectations of negative break ups were less likely to engage in condomless anal sex, both insertive and receptive, despite our contrary initial hypothesis. Given that past research has found YGBM with greater negative break up appraisals are associated with lower psychological well-being, and the comparable association between relational fear and negative break ups, we initially hypothesized that YGBM with greater expectations to negative break ups would engage in increased rates of condomless anal sex (Ceglarek et al., 2017). However, our findings point in the opposite direction. One plausible explanation for our findings is that YGBM who expect more negative results from a break up may be more fearful to engage in CAS because of this fear of being hurt or rejected, based on personal experience. Thus, these individuals may be more selective and cautious about engaging in condomless anal sex with non-primary partners. We suggest future research further assess this construct of negative break ups in this context to better understand its implications for HIV risk.

YGBM who endorsed greater expectations of optimism after a break up were significantly more likely to engage in I-CAS and but less likely to engage in R-CAS. Our finding for R-CAS are consistent with our hypotheses, but we did not hypothesize discrepancy between I-CAS and R-CAS. Among existing literature, positive break up appraisals among YGBM have previously been associated with greater anxiety (associated with rumination), positive self-esteem and personal competence (Ceglarek et al., 2017). The negative association between R-CAS and

expectations of optimism is supported by a qualitative study with GBM who associate low self-esteem with experiences of condomless anal sex (Adam, Husbands, Murray, & Maxwell, 2005). Taken together, these findings may suggest that YGBM with greater expectations of optimism may have greater self-esteem and may be more likely to negotiate condom use or sexual-risk taking behaviors. Further examining the measure of our subscale adds greater clarity ("When a relationship ends, I ultimately leave with a better sense of what I desire/offer in a future relationship") as our construct of optimism may also be associated with high self-efficacy, which itself may reduce number of partners for R-CAS (José A. Bauermeister et al., 2014). However, to explain our finding of increased number of partners for I-CAS we rely on the association between positive break up appraisals and high self-esteem in different contexts. Qualitative findings with YGBM from Johns et al. (2014) associate being the insertive partner during sex with high self-esteem and being assertive (Johns, Pingel, Eisenberg, Santana, & Bauermeister, 2012). It is possible that YGBM in our study who endorse greater expectations of optimism embody greater self-esteem and urge their partners to engage in condomless sex as the insertive, and less risky, partner. Given the scarcity of resources on optimism after a break up and outcomes of HIV risk, we recognize the need for future research to better understand how these factors interact.

The negative relationship between expectations of immediacy and R-CAS was also not consistent with our initial hypothesis, but may be best explained by our conceptualization of immediacy. While expectations of relational immediacy may have a negative connotation to romantic obsession (Missildine, Feldstein, Punzalan, & Parsons, 2005), we instead suggest that our measure touches on concepts of self-assurance and confidence. In the same regard, confidence and self-assurance are also related to self-efficacy for condom use, which is a protective factor in HIV risk among adolescents (Baele, Dusseldorp, & Maes, 2001; Gloppen, David-Ferdon, & Bates,

2010). Our findings for R-CAS also found relational beliefs pertaining to sex in relationships and equality were protective factors among YGBM. Specifically, our measure of sex beliefs is analogous to relational closeness. Previous literature on relational closeness among partnered GBM identified closeness as a protective factor associated with HIV prevention intentions and behaviors (Gamarel & Golub, 2019). Likewise, previous literature on equality and power dynamics in romantic relationships suggest equality in romantic relationships to be protective, while power discordance may increase the likelihood of condomless anal sex outside of the relationship (Mitchell & Sophus, 2017). Taken together, although extant literature on closeness and equality was conducted with partnered GBM, we hypothesize that the cognitions behind these factors are significant for single YGBM as well.

Evidently, our measure of cheating, as it relates to relational expectations, was the only subscale to be positively associated with R-CAS, challenging our initial hypothesis. However, it is possible that our measure of cheating also captures aspects relationship exclusivity. Previous research on relationship exclusivity has focused on partnered YGBM and has found that men who score high in relationship exclusivity report higher condom use with casual partners (Cuervo & Whyte, 2015). Though this construct has not been explored among single YGBM. Our findings indicate a difference in behaviors from men who are partnered and YGBM who are single. It is possible that YGBM with stronger reactions to cheating may engage in R-CAS while single, but these behaviors may change when partnered. Future research should explore this construct further through longitudinal research to test this hypothesis. Additionally, a limitation to our finding is that cheating was left open-ended and could include emotional, physical, online, in person etc. Future research should test these different aspects of this broad concept.

Our findings provide novel insights regarding how relational cognitions are associated with HIV risk among YGBM, though what is less clear is why many of our findings for R-CAS were not significant for I-CAS. Literature on the sexual dynamics of sex have explored the role of "topping" (I-CAS) and "bottoming" (R-CAS) as they relate to gender roles, racial stereotypes, and power dynamics (Johns et al., 2012; Kubicek et al., 2015; Lick & Johnson, 2015). Based on extant literature, we suggest there are nuances between sexual roles, specifically, the role of the receptive partner, which may be associated with physical vulnerability, emotional vulnerability, and intimacy. Thus, while many of our findings were negatively associated with R-CAS, they were not significant for I-CAS. Future research should explore the intersection between sexual roles as they relate to relational beliefs and outcomes of HIV risk. Lastly, for both I-CAS and R-CAS, we did not find expectations of relational restrictions and masculine and gender norms to be significant. While we believe these constructs are significant, one potential reason for our findings may be linked to our conceptualization of these factors. In regard to relational restrictions, it is possible that these restrictions may be malleable based on romantic partners and evolution of relationships. Likewise, previous research has illustrated the significance of masculinity and masculine norms in HIV risk behavior among YGBM (Fields et al., 2012; Fleming, DiClemente, & Barrington, 2016). However, this construct has not been studied from a relational expectation perspective. It is possible that there may be discrepancy about ideals between romantic relationships and sexual relationships. Despite the reliability and validity of our measures on YGBM, we support further research on these constructs and how they relate to HIV risk.

Apart from relational cognitions, our findings also present significant findings among our covariates. Participants who indicated greater beliefs in foregoing condoms to create emotional intimacy between partners were more likely to report greater instances of I-CAS and R-CAS; these

findings are consistent to what has previously been found in the literature (José A. Bauermeister et al., 2012). Further, as YGBM frequently use online platforms for social and sexual relationships, our finding that increased time spent online to hook up was associated with an increased risk of I-CAS and R-CAS are consistent with previous literature (José A. Bauermeister et al., 2011; Liau, Millett, & Marks, 2006). Moreover, previous research on dating websites as a means to hook up or date have found that these apps/sites are a medium for individuals to engage in pursuits of love, sex, and intimacy (Hobbs, Owen, & Gerber, 2017). Our bivariate associations found significant associations between relational constructs and time spent online to hook and date, though future research can explore this relationship more directly. We found that having experience in a previous serious relationship with another man was associated with increased risk of I-CAS and R-CAS compared to participants with no previous serious relationship experience. This association between relationship experience and condomless anal sex among YGBM has previously been explored in longitudinal research by Glick & Golden (2014), who found in their sample, YGBM's early relationships were characterized by high rates of condomless anal sex, which persisted at follow up (Glick & Golden, 2014). It is possible that while YGBM may associate condomless anal sex with emotional intimacy (Greene et al., 2014), after initial experience with condomless anal sex, this relationship may fade, and engagement in condomless sex may become more acceptable, even when controlling for age. We suggest future longitudinal research to explore YGBM beliefs about a decisional balance to forego condoms before and after experiences of condomless anal sex. Together, these findings point to the multiple intersections between factors for YGBM as they engage in online sexual exploration, romantic relationship experiences, and perceptions about condom use.

Our research possesses many strengths and limitations. First, given that our data is cross-sectional in nature, we cannot confer causal relations for our findings. Based on the flexible nature of shifting cognitions it is important that future research employ longitudinal methods to explore how beliefs may change over time and based on experiences. Second, our sample was based on an online convenience sample of YGBM and may not be generalizable to all YGBM. Specifically, we believed it was important to include bisexual men and keep them distinct from gay men, given limited research on bisexual men and the prevalence of health disparities among this population (Friedman et al., 2014). However, our study question only asked about same-sex relational cognitions and did not account for opposite sex relationships. Next steps in this research could explore how relational cognitions may be similar or different among bisexual individuals with different relationship types. Moreover, racial/ethnic minority YGBM were not equally represented. Next steps in this research will be to explore these scales among varying ethnic and economic groups on outcomes of HIV risk. Further, our eligibility criteria may also limit generalizability, as participants were required to have access to the Internet, as well as use a dating website in the past three months. Despite these limitations, we were able to recruit a large national sample of YGBM prior to the omnipresence of social media and networking apps such as Facebook or Grindr. Based on the time frame of data and research collected, we were unable to explore outcomes of Pre-exposure prophylaxis (PrEP) behavior; this may provide important context as condomless sex no longer confers the same risk of HIV infection among adherent PrEP use. Although, current research has employed aspects of our constructs of closeness and intimacy on outcomes of PrEP use among MSM with similar findings (Gamarel & Golub, 2019). Another limitation to our research is our inability to identify the types of relationships in which YGBM engaged in condomless anal sex. While all participants identified as single further exploring

relationship type (i.e. hook up, or friends with benefits) is warranted to add insight on how HIV risk may fluctuate. Moreover, our measure of CAS may be limited. While we were focused on frequency of condomless experiences, as condomless sex is a main transmission route for YGBM, our findings do not account for YGBM who engaged in sex with condoms. Future research should explore these differences among YGBM, as including both behaviors may better understand HIV risk among YGBM. Finally, based on our significant finding for experience with a serious relationship on both outcomes of condomless anal sex and possibility of how cognitions may change based on this experience, we attempted to conduct post-hoc analyses to stratify our sample by participants with serious relationship experience. However, low numbers of participants without serious relationship experience limited this analysis. We implore further qualitative and quantitative research to explore this factor as a potential confounder. Lastly, given significant differences between sexually active and non-sexually active participants among various variables, including relational constructs, our interpretations are limited to only sexually-active YGBM. Considering we were testing the effects of these relational scales on outcomes of HIV risk, we did not feel it was appropriate to impute data for these analyses.

Notwithstanding these limitations, our research is the first to assess relational beliefs and expectations among YGBM on outcomes of HIV risk using subscales developed for this population. Our findings build on previous literature by further exploring the role of relational cognitions on HIV risk and illustrate the importance of public health interventions to recognize relational cognitions on interventions for YGBM. Respectively, we explored relational expectations and beliefs separately, as implications of each have different results for HIV risk. As such, interventions should consider significance of both expectations and beliefs as they relate to HIV risk. Practical implications for our research suggest that HIV programs should include

discussions about romantic relationships, relational beliefs and expectations. These discussions may help YGBM promote healthy cognitions about relationship beliefs and expectations, building confidence and self-efficacy in condom negotiation and other risk reduction behaviors. Additionally, expectations of negative break ups were protective on both outcomes of condomless anal sex, signaling its importance in HIV prevention. Interventions for YGBM that encourage emotional regulation as well as cognitive restructuring skills are important to build resilience among this population. One example of such is preparing YGBM for relational difficulties and promoting optimism as it relates to resilience, coping, and self-esteem. Among relational beliefs, greater endorsement about the importance of sex and equality in a romantic relationship were associated with decreased number of partners for R-CAS. HIV interventions should take these into account and design workshops to teach about sex, intimacy, power dynamics, and equality within relationships. Finally, innovative HIV interventions must not only be cognizant about relational expectations and beliefs, but they should also consider how these may change over time, and with different relationships. Specifically, there may not be a 'one size fits all' approach, and interventions must adapt and be relevant for different ages, relationship types, and stages in relationships (i.e. dating, serious relationship, co-habiting etc.) as risk and behaviors may differ accordingly. Given our success in recruiting a large sample of YGBM, we urge public health professionals to utilize the online environment to target and reach this vulnerable population. Based on our findings, YGBM largely engage online to hook up and find romance, providing an ideal environment for interventions.

In all, our research highlights the complex nature of relational cognitions as they may increase or lessen HIV risk among YGBM. Given the eventuality that most YGBM will engage in romantic relationships throughout the life course, our findings are pertinent to both single YGBM

and YGBM in relationships. As such the implications of this research are extensive, and have the ability to make a significant impact on the HIV epidemic among YGBM.

5.0 TESTING RELATIONAL BELIEFS AND EXPECTATIONS ON OUTCOMES OF ANXIETY AND DEPRESSION AMONG YOUNG GAY AND BISEXUAL MEN

Jordan Sang, MPH

Department of Behavioral and Community Health Sciences

Graduate School of Public Health, University of Pittsburgh

5.1 INTRODUCTION

Adolescence is a period of time between childhood and adulthood. This transitionary period is marked by numerous physical and psychological changes, identity formation, and maturation. These changes include brain development, which is influenced by increased hormones and interest in sex; cognition and behavior maturity; and social and emotional development skills (Steinberg, 2005; Wierenga et al., 2018). Correspondingly, adolescence is also marked by increased autonomy and greater emphasis on relationships beyond family and friends (Smetana, Campione-Barr, & Metzger, 2006). Romantic relationship exploration is common in adolescence with growing research identifying potential benefits from exploration (Collins et al., 2009). Extant research on adolescents has found romantic relationships to be beneficial because they provide youth with opportunities to master critical skills related to patience, mutuality, commitment, trust, and emotional regulation (L. Diamond, 2003; Furman & Wehner, 1994; Lantagne & Furman, 2017). Additionally, romantic relationships in adolescence have also been found to bolster

emotional development, self-esteem and identity formation (Brown, 1999; Luciano & Orth, 2017). However, the benefits and ease in engaging in romantic relationships is unequal among all adolescents. Adolescence and romantic engagement may be especially confusing and troubling for sexual minority youth who may face stigma about their sexuality and romantic partners (L. Diamond, 2003).

Sexual minority youth have an increased risk for mental health disparities compared to heterosexual youth (Bostwick et al., 2010; Teasdale & Bradley-Engen, 2010). Although national incidence and prevalence of mental disparities among sexual minorities are lacking, Mustanski et al. (2010) recruited a community sample (N=246) of sexual and gender minority youth and found 31% of youth in the sample reported lifetime suicide attempts, 15% met criteria for major depression, and 9% met criteria for posttraumatic stress disorder (Brian Mustanski, Garofalo, & Emerson, 2010). Moreover, a meta-analysis of mental health outcomes among sexual minority and heterosexual youth found sexual minority youth reported higher rates of depressive symptoms (d=0.33) compared to heterosexual youth (Marshal et al., 2011). Specific to young gay and bisexual men (YGBM) Shearer et al. (2016) found YGBM reported significantly higher rates of depression, traumatic stress, anxiety, and lifetime suicidal behavior compared to heterosexual males (Shearer et al., 2016).

Previous studies have explored multiple correlates of mental health outcomes to explain these disparities. Significant findings indicate that increased social support and resilience have negative associations with poor mental health outcomes (DiFulvio, 2011; Lyons, Hosking, & Rozbroj, 2015b). Moreover, researchers have identified the online environment as a contributor to increased depression and anxiety (Odacı & Kalkan, 2010; Turban, 2018). Lastly, extant literature has explored previous romantic relationships as a significant factor for mental health outcomes

such as depression and substance abuse among adolescence (Sprecher & Metts, 1999). We include these significant factors in our analyses.

Literature on romantic relationships and mental health outcomes among sexual minority youth yield mixed findings. Among a sample of sexual minority youth in New York City, Bauermeister et al. (2010) reported that same-sex relationship involvement was positively associated with increased self-esteem over time in sexual minority males and negatively correlated with internalized homophobia over time in females (José A. Bauermeister et al., 2010). These findings are consistent with research from Glover et al. (2009) who reported that sexual minorities who did not engage in same-sex relationships also reported lower relational esteem (to positively evaluate one's capacity to relate intimately to another person) and greater relational depression (to feel depressed about the status of one's romantic relationships) compared to youth who engaged in same-sex relationships. (Glover et al., 2009). However, the benefits of romantic relationships on mental health outcomes among sexual minority youth is not concordant. Russell and Consolacion (2003) used longitudinal data and found adolescents in same-sex relationships report the highest rates of suicidal thoughts in comparison to single sexual minorities and heterosexual adolescents. Additionally, the authors report that sexual minority youth who are dating had less anxiety, but more depression, in comparison to heterosexual youth who are single (Stephen T. Russell & Consolacion, 2003). Collectively, these mixed findings signal the need for additional research to explore nuanced perspectives to better understand how romantic relationships are associated with mental health outcomes among sexual minority youth.

Relational cognitions (mental process of acquiring knowledge and understanding about relationships) form the context for romantic relationship experiences and expectations, yet have rarely been explored in the literature. As relational cognitions are associated with cognition and

mental processes, it is logical that cognitions may inform mental health as well. However, relational cognitions specific to YGBM have yet to be identified or explored. Relational cognitions are comprised of relational beliefs and relational expectations. We define relational beliefs as generalized ideas, attitudes, and views on how romantic relationships should be, which are informed by observational learning from the social environment; these may or may not be linked to behaviors. Relational expectations are defined as hopes, desires, or fears about romantic relationships, which are products of beliefs. Relational expectations differentiate from beliefs when an individual links a belief to behaviors in hopes of achieving an outcome (what people anticipate will happen based on what they do). The importance of relational cognitions is that these may first be developed in adolescence, yet they have continual influence on informing future relationship development and relationship functioning (Hefner & Kahn, 2014; Sprecher & Metts, 1999; Vannier & O'Sullivan, 2017).

Compared to extensive literature on the association between romantic relationships and mental health outcomes, there is little known on how relational cognitions are associated with mental health outcomes. Among the limited literature, a study on heterosexual adolescents found that relationship inauthenticity (incongruence between thoughts/feelings and actions within a relationship) were associated with depression, suicide ideation, and suicide attempts among girls (Soller, 2014). Specific to YGBM, Ceglarek et al. (2018) examined expectations of break up appraisals on mental health outcomes among single YGBM. The authors reported negative break up appraisals were associated with positively associated with depressive and anxiety symptoms and negatively associated with self-esteem and personal competency (Ceglarek et al., 2017). Taken together, these findings present growing literature to support the significance of relational cognitions on mental health outcomes.

Despite growing literature on romantic relationships and mental health outcomes among sexual minority youth, research has not explored the role of relational cognitions on mental health outcomes among sexual minorities. Building on the extant literature, our research fills a gap by exploring associations between relational cognitions and mental health outcomes among YGBM. Utilizing multi-dimensional measuring salient traits on how YGBM think about relationships, our study's main objective was to test relational beliefs and expectations on outcomes of depression and anxiety among YGBM. Relational expectation subscales measure: relationship restrictions, negative breakups, optimism, cheating, masculine and gender norms, and immediacy. Relational belief subscales measure: sex beliefs and relationship equality. These subscales were developed from qualitative interviews among YGBM and validated using factor analysis, and demonstrated internal validity, consistency, and factor reliability. Specifically, we wanted to assess how different relational beliefs and expectations may be protective or increase risk on outcomes of depression and anxiety, two of the most consistently documented mental health disparities among sexual minorities. We hypothesized that greater endorsement of relational constructs related to negative break ups, masculine and gender norms, immediacy, and cheating, will positively be associated with anxiety and depression. Alternatively, greater endorsement of constructs of optimism, equality, sex beliefs, and restrictions, will negatively be associated with anxiety and depression. Our hypotheses are based on prior research related to these constructs and our interpretation of underlying constructs (See Appendix C & D). For example, our hypothesis on negative breakups is based on prior literature measuring negative appraisals among YGBM, which found a positive association to lower psychological well-being (depression, anxiety, self-esteem, and personal competency) (Ceglarek et al., 2017). Additionally, our hypothesis of restrictions on anxiety are based on our interpretation of this factor related to communication and commitment. Prior

literature has indicated previous associations between anxiety and relationship commitment (Etcheverry, Le, Wu, & Wei, 2013). Additionally, previous literature has also demonstrated an association between higher anxiety and lower sexual communication among adolescents (Montesi et al., 2013). Taken together, our research may provide a nuanced understanding on how relational beliefs and expectations are associated with depression and anxiety among YGBM, with implications on how to improve psychosocial health among this population.

5.2 METHODS

Design

Data comes from the Virtual Love Study, an observational cross-sectional study that examined YGBM's dating experiences online. This data comes from July 2012 until January 2013, and had an analytic sample of 1,582 YGBM. (José A. Bauermeister et al., 2011)

Recruitment and Eligibility

The Virtual Love Study recruited participants through advertisements on two popular social networking sites, participant referrals, and flyers posted at local venues commonly frequented by YGBM. Ads were targeted to men who met inclusion criteria. Recruitment materials specified the incentive offered, eligibility criteria (broad definition of "dating websites") and the survey website. To be eligible, participants had to be between 18 to 24 years old; report being single at time of data collection; have used a dating website in the past three months; and have had sexual activity with a male partner that they met online in the previous six months. The final sample included participants from 44 out of 50 states and Puerto Rico.

Data Collection

Participants were asked for their email to serve as their username, and this allowed participants to save answers as they move through the survey so that they could exit the survey and come back at a later time if needed. Participants then completed eligibility screeners and if inclusion criteria were met, they were prompted to complete consent forms. Next, consented participants completed an online questionnaire that assessed socio-demographic characteristics, Internet use, ideal relationship and partner characteristics, sexual behaviors, and psychosocial well-being. If participants did not complete the survey all at once, they were sent two reminder emails encouraging them to complete the survey. Participants received a $10 electronic gift card for completing the survey. All study procedures were approved by the University of Michigan Institutional Review Board. The University of Pittsburgh Institutional Review Board approved the use of these secondary data analyses with de-identified data.

Measures

Sexual identity

Sexual identity was assessed with the question "If you had to select just one identity, which would most closely fit how you identify?" Responses were, Gay/Homosexual, Bisexual, Straight/heterosexual, Same gender loving, MSM, or Other. Heterosexual and Other identified participants were removed from analysis. The remaining responses were dichotomized as follows: gay/homosexual, same gender loving, and MSM were combined into one category, and bisexual identity was kept separate.

Minority Status

Race was assessed with the question, "What is your race?" Response options included White/Caucasian, Black/African American, Asian/Pacific Islander, Middle Eastern, Native

American, and Other. Ethnicity was assessed with the question, "Are you Hispanic/ Latino?" Response options were "Yes" or "No." Due to small sample sizes for racial/ethnic minorities, we decided to dichotomize race/ethnicity into minority status. Participants who indicated that they were White/Caucasian only and who responded "No" to ethnicity were identified as Non-Hispanic White. Participants who indicated at least one race other than White or who indicated "Yes" to ethnicity, were identified as racial/ethnic minorities. This procedure is consistent with previous analyses of these items (José A. Bauermeister et al., 2012).

Educational Attainment

Education attainment was assessed with the question, "What is the highest level of education that you have completed?" Responses options were (1 = Less than high school, 2 = High school, 3 = Technical/Associate degree, 4 = Some College, 5 = College, 6 = Some Graduate School, 7 = Graduate School). We treated this variable as continuous in our analyses, based on previous handling of this item (José A. Bauermeister et al., 2011).

Serious Relationship with a Man

We asked participants if they have ever had experience being in a serious relationship with another man, "How many serious relationships (lasting more than 3 months) have you had with men?" Participant were asked to enter a number.

Resilience

Resilience was measured using a 14-item adapted version of the Connor-Davidson Resilience Scale (Connor & Davidson, 2003). Example questions include, "I like challenges," and "I know that I can solve my personal problems." Participants responded through a four-point scale ranging from "Never True" (1) to "Often True" (4). We computed a mean composite score, with

higher scores indicating greater resilience. Cronbach's alpha reliability for this scale was 0.933, indicating high reliability.

Friends Social Support

Friends social support was measured using a 9-item adapted version of the Perceived Social Support Scale for Friends (Glozah & Pevalin, 2017). Example questions include, "My friends give me the moral support I need," and "My friends understand me." Three questions were reverse coded, "Although I trust my friends, sometimes I have my doubts about them," "I feel angry towards my friends," and "I wish I had different friends." Participants responded through a four-point scale ranging from "Not True" (1) to "Very True" (4). We computed a mean composite score, with higher scores indicating greater friends support. Cronbach's alpha reliability among our sample was 0.778, indicating high reliability.

Time spent online for dating/ hooking up

Prior to answering questions on Internet use for dating and hooking up, participants were given definitions for dating (i.e., getting to know another man for a potential romantic relationship) and hooking up (i.e., having a ''no strings attached'' sexual encounter with another man). These definitions were created from previous qualitative interviews conducted with YGBM. We then asked participants to describe how often they used the Internet to find someone to hook up or date, "During the past 2 months, how many times did you go online to hookup?" and "During the past 2 months, how many times did you go online to find someone to date?" Treating hooking up and dating separately is important because of different risks associated with different partner seeking behaviors (Bauermeister et al., 2011). Responses ranged from 0= "Never" to 7= "More than once a day". Consistent with prior operationalization of these questions and given few responses in some cells, we recoded responses to a 4-point scale, to maximize interpretation. Responses were

0 = Never, 1 = Rarely (Once a month or less), 2 = Sometimes (2–3 times a month), and 3 = Often (Once a week or more/2–6 times a week/About once a day/More than once a day) (Bauermeister et al., 2011).

Relational Expectation Subscales

Relational Restrictions

The relational restrictions subscale consists of seven-items that ask participants their opinion about possible restrictions within a romantic relationship. Example questions include, "Committing to a serious relationship right now would keep me from enjoying my life," "It is acceptable for my partner to use drugs," and "I would be willing to have an intense but short relationship." Participants responded through a five-point scale ranging from "Not True" (1) to "Very True" (5). All items in this scale were reverse coded for ease of interpretation. Finals scores were added together and averaged to create a score out of 5. Higher scores indicate desire for more restrictions in a relationship and lower scores indicate lower desire for restrictions in relationships. The Cronbach's alpha for this scale among our sample was 0.790, indicating high reliability.

Negative Break Ups

The negative break ups subscale consists of four-items that ask participants how much they think a break up would affect them. An example question is, "I feel powerless when a partner breaks up with me." Participants responded through a five-point scale ranging from "Not True" (1) to "Very True" (5). Finals scores were added together and averaged to create a score out of 5. Higher scores indicate greater perceptions about negative breakups and lower score indicate lower perceptions of break ups. The Cronbach's alpha for this scale among our sample was 0.855, indicating high reliability.

Masculine and Gender Norms

The masculine and gender norms subscale consists of four-items that ask participants about their expectations of masculine and gender norms in their partner. Example questions include, "I only want to date men who are masculine." Two-items were reverse coded: "I would date a man who does drag" and "I would date an effeminate man." Participants responded through a five-point scale ranging from "Not True" (1) to "Very True" (5). Finals scores were added together and averaged to create a score out of 5. Higher scores indicate greater endorsement of masculine and gender norms in a relationship and lower scores indicate a lower endorsement. The Cronbach's alpha for this scale among our sample was 0.771, indicating high reliability.

Optimism

The optimism subscale consists of two-items that ask participants their perceptions about optimism after a break up. An example question is, "When a relationship ends, I ultimately leave with a better sense of what I desire in a future relationship." Participants responded through a five-point scale ranging from "Not True" (1) to "Very True" (5). Finals scores were added together and averaged to create a score out of 5. Higher scores indicate greater expectations of optimism after a break up and lower scores indicate lower expectations of optimism. The Cronbach's alpha for this scale among our sample was 0.856, indicating high reliability.

Cheating

The cheating subscale consists of two-items that ask participants how they expect to react to cheating in a relationship. The concept of cheating was left open-ended and not defined to include specific aspects of cheating. An example question is, "If I cheated on my partner, I would expect him to break up with me." Participants responded through a five-point scale ranging from "Not True" (1) to "Very True." (5). Finals scores were added together and averaged to create a

score out of 5. Higher scores indicate stronger reactions to cheating, and lower scores indicate lower reactions to cheating. The Cronbach's alpha for this scale among our sample was 0.769, indicating high reliability.

Immediacy

The immediacy subscale consists of two-items that ask participants how quickly they would expect to develop and express love within a relationship. An example question is, "I tend to tell someone that I love him within the first month of dating." Participants responded through a five-point scale ranging from "Not True" (1) to "Very True" (5) Finals scores were added together and averaged to create a score out of 5. Higher scores indicate quicker expectations of love and lower scores indicate slower expectations of love. The Cronbach's alpha for this scale among our sample was 0.741, indicating high reliability.

Relational Belief Subscales

Sex Beliefs

The sex beliefs subscale consists of three-items that ask participants their perceptions about the role and importance of sex in a romantic relationship. An example question is "Sex brings two people closer together." Participants responded through a four-point scale ranging "Strongly disagree" (1) to "Strongly agree" (4) Finals scores were added together and averaged to create a score out of 4. Higher scores indicate greater beliefs about the importance of sex within a romantic relationship and lower scores indicate lower beliefs about the importance of sex. The Cronbach's alpha for this scale among our sample was 0.773, indicating high reliability.

Equality

The equality subscale consists of two-items that ask participants about their beliefs in equality within a romantic relationship. Participants responded through a four-point scale ranging

"Strongly agree" (1) to "Strongly disagree" (4). Finals scores were added together and averaged to create a score out of 4. Higher scores indicate greater beliefs about equality within a relationship and lower scores indicate lower beliefs about equality in relationships. The Cronbach's alpha for this scale among our sample was 0.727, indicating high reliability.

Depression

Depression was measured using the CESD-10 (Van Dam & Earleywine, 2010). The scale consists of 10-items which asks participants how often they felt during the past week. Example questions include "I felt depressed," and "My sleep was restless." We reverse coded two questions, "I was happy," and "I felt hopeful about the future." Participants responded through a four-point scale ranging from "Rarely or none" (1) to "All of the time" (4). We computed a mean composite score, with higher scores indicating greater depressive symptoms. Cronbach's alpha reliability for the CESD-10 among our sample was 0.782, indicating high reliability.

Anxiety

Anxiety was measured using the anxiety subscale of the Brief Symptom Inventory (BSI) (Lang, Norman, Means-Christensen, & Stein, 2009). The scale included 6-items which asked participants how often they felt a certain way in the past week. Example questions include, "Suddenly scared for no reason," and "Feeling so restless you couldn't sit still." Participants responded through a four-point scale ranging from "Never" (1) to "Very often" (4). We computed a mean composite score, with higher scores indicating greater anxious symptoms. Cronbach's alpha reliability for the BSI among our sample was 0.917, indicating high reliability.

Analytic Procedures

We removed any participants with missing data using listwise deletion, which left us with a final analytical sample of N=1,325. We next performed independent sample t-test between

participants with missing data and our final sample to test for significant differences between participants in our analysis and participants with missing data. For non-normally distributed items we used the Whitney-Mann test. We found significant differences between the two samples on seven variables: education, age, resilience, friends social support, restrictions, negative breakups, optimism, and sex beliefs. Univariate analyses were conducted to describe our sample (Table 1), and we then conducted bivariate correlations between variables of interest and our outcomes of depression and anxiety (Table 2). Next, we applied multivariable linear regression on both mental health outcomes, with significance set at $p<.05$. All analyses were conducted using SPSS Software, version 24 (IBM Corp., Armonk, NY).

5.3 RESULTS

Table 5-1: Demographic of YGBM (N=1,325)

Variables	N (%)
Sexuality	
Gay/MSM	1287(97.1)
Bisexual	38 (2.9)
Minority Status	
Non-Hispanic White	872 (65.8)
Racial/Ethnic Minority	453 (34.2)
	M (SD)
Age	20.83 (1.91)
Educational Attainment [a]	5.36 (1.74)
Serious Relationship with other men, No.	1.69 (1.71)
Online Dating	3.31 (1.54)
Online Hook up	2.62 (1.56)

Table 5-1 Continued

Resilience	3.52 (.59)
Friends Social Support	3.03 (.52)
Relational Expectations [b]	
Restrictions	4.03 (.77)
Negative Break Ups	2.87 (1.03)
Masculine & Gender Norms	3.07 (1.04)
Optimism	3.58 (1.09)
Cheating	3.79 (1.14)
Immediacy	2.18 (1.13)
Relational Beliefs [c]	
Sex Beliefs	3.21 (.61)
Equality	3.45 (.53)
Mental Health Outcomes	
Depression	2.21 (.59)
Anxiety	2.11 (1.01)

[a] *(1 = Less than high school, 2 = High school, 3 = Technical/Associate degree, 4 = Some College, 5 = College, 6 = Some Graduate School, 7 = Graduate School)*
[b] *(1=Not True, 2= A little true, 3= Somewhat True, 4=Pretty true, 5=Very True")*
[c] *(1=Strongly Disagree, 2= Disagree, 3=Agree, 4=Strongly Disagree)*

Sample Description

The average age for our sexually active sample was 20.87, and most participants reported completing college (M=5.38). The majority of our sample self-identified as gay (97%), while 3% reported being bisexual. Most of the sample identified as non-Hispanic White (65%), compared to 35% who identified as a racial/ethnic minority. Among relational outcomes, participants had the highest endorsement of restrictions (M=4.03, SD=.77) and the lowest endorsement of immediacy (M=2.18, SD=1.13). Mean scores on depression (M=2.21, SD=.59) and anxiety (M=2.11, SD= 1.01) revealed similar scores for both outcomes. Full results can be found in Table 5-1.

Our bivariate associations revealed significant correlations ($p < 0.05$) between our outcome of depression and age (r= -.08), time spent online for dating (r=.06), resilience (r= -.30), friends social support (r= -.19), constructs of restrictions (r= -.10), negative break ups (r= .42), immediacy (r= .17), and equality (r= .4). Significant bivariate associations were found between our outcome of anxiety and age (r= -.07), education (r= -.05), time spent online for hooking up (r=.05), resilience (r= -.27), friends social support (r= -.20), constructs of restrictions (r= .22), negative break ups (r= .40), and immediacy (r= .21). Full results can be found in Figure 5-1.

	Age	Ed	Sx	MS	SR	OD	OH	Resil	Fr	Rest	Neg	M&G	Opt	Cheat	Imm	SB	Equal	Anx	Dep
Education (Ed)	.41**																		
Sexuality (Sx)	.00	.10**																	
Minority Status (MS)	-.00	.08**	.07**																
Serious Relationship (SR)	.16**	.01	-.06**	-.03															
Online Dating (OD)	.14**	.07**	-.02	.04	.08**														
Online Hook Up (OH)	.11**	.05*	-.01	-.04	.10**	.24**													
Resilience (Resil)	.03	.10**	.08**	-.00	.05*	-.01	-.03												
Friends (Fr)	.04	.03	.08**	.03	.05	-.04	-.07*	.39**											
Restrictions (Rest)	.01	-.00	.11**	.11**	-.04	.06*	-.26**	.05	.13**										
Negative Break Up (Neg)	-.07*	-.06*	-.00	-.01	.08**	.06**	.07**	-.22**	-.05*	-.10**									
Masculine & Gender Norms (M&G)	.00	-.03	.02	-.09**	-.06**	-.02	-.02	.02	-.03	-.05*	-.05*								
Optimism (Opt)	-.01	.02	.04*	-.00	.07**	.00	-.04	.29**	.15**	-.03	.00	.00							
Cheating (Cheat)	-.09**	-.04	.00	.04	.00	-.03	-.16**	.13**	.12**	.17**	.11**	.04	.19**						
Immediacy (Imm)	.00	-.11**	.03	-.04	.08**	.10**	.11**	-.09**	-.06	-.21**	.31**	-.03	.03	.00					
Sex Beliefs (SB)	.12**	.18**	.03	.03	.04	.05*	.17**	.08**	.05**	-.13**	.08**	.04	.10*	-.01	-.00				
Equality (Equal)	.00	.06**	.07*	.09**	-.017	-.01	-.06*	.16**	.12**	.13**	.04	-.03	.23**	.20**	-.02	.17**			
Anxiety (Anx)	-.07*	-.05**	-.03	-.02	.01	.00	.05*	-.27**	-.20**	.22**	.40**	-.00	.00	.04	.21**	.00	-.00		
Depression (Dep)	-.08**	-.04	.00	.00	.00	.06*	.05	-.30**	-.19**	-.10**	.428*	.00	.00	.04	.17**	.03	.04*	.71**	

Figure 5-1: Correlation matrix of study variables (N=1,325)

Table 5-2: Multivariable linear regressions on mental health outcomes among YGBM (N=1,325)

	Depression		Anxiety	
	b(SE)	***β***	***b(SE)***	***β***
Age	-.01 (.00)	-.05	-.02 (.01)	-.03
Sexual Orientation [a]	.12 (.08)	.03	.01 (.14)	.00
Minority Status [b]	.01 (.03)	.01	.00 (.05)	.00
Education	.00 (.00)	.01	.00 (.01)	.01
Friends Social Support	-.11 (.03)	-.09**	-.21 (.05)	-.11**
Resilience	-.21 (.02)	-.21**	-.28 (.04)	-.16**
Online Hook Up	-	-	-.00 (.01)	-.01
Online Dating	.01 (.00)	.04	-	-
Relational Cognitions				
Restrictions	-.04 (.02)	-.06*	-.21 (.03)	-.17**
Masculine & Gender Norms	.02 (.01)	.03	.02 (.02)	.02
Negative Break Ups	.20 (.01)	.34**	.31 (.02)	.31**
Optimism	.02 (.01)	.05*	.04 (.02)	.04
Cheating	.01 (.01)	.02	.04 (.02)	.04
Immediacy	.01 (.01)	.02	.05 (.02)	.06*
Sex Beliefs	.00 (.02)	.00	-.04 (.04)	-.02
Equality	.07 (.02)	.06**	.05 (.04)	.03

[a] *Reference group is Gay*
[b] *Reference group is Non-Hispanic White*
*** significant at <.001; * significant at <.05*

Mental Health Outcomes

Depression

Our multivariable regression analysis for depression symptoms [F(15, 1309) = 30.03, p <.001] found friends social support (β= -.09), resilience (β= -.21) negatively associated with depression. Among relational expectations, relational restrictions (β= -.06) had a negative association with depression, while expectations of negative break ups (β= .34) and optimism (β= .05) were positively associated with depression. Among relational beliefs, beliefs about equality (β= .06) were positively associated with higher depressive scores. The adjusted R^2 for this model was 24.7%. Full findings can be found in Table 5-2.

Anxiety

Our multivariable regression analysis for anxiety symptoms [F(15, 1309) = 29.11, p <.001] found friends social support (β= -.11), resilience (β= -.16), negatively associated with anxiety. Among relational expectations, expectations of restrictions (β= -.17) were negatively associated with anxiety scores. Alternatively, we found the constructs of negative break ups (β= .31), and immediacy (β= .06) positively associated with higher anxiety scores. Relational beliefs were not significant for anxiety. The adjusted R^2 for this model was 24.2%. Full findings can be found in Table 5-2.

5.4 DISCUSSION

In our current research, we explored relational cognitions from two dimensions: relational expectations and relational beliefs. Within these dimensions we explored several constructs as they relate to mental health, including relational restrictions, negative break ups, and equality.

Exploring outcomes of depression, our findings indicated positive associations with relational constructs of equality, optimism and negative breakups. Our finding for negative break ups support our hypothesis, and existing literature which previously found greater negative appraisals among single YGBM were associated with increased depressive symptoms (Ceglarek et al., 2017). However, our findings for optimism and equality were not support by our initial hypotheses. While we initially thought optimism and equality would be protective against depression, it is possible that YGBM who endorse these constructs may also possess greater desires, insecurities and hopes for these ideals. Given that YGBM in our study were single, their prior relationship experiences may not have matched with these ideals or they may long to attain these ideals in future romantic relationships. However, it is unknown if YGBM who've experienced these relationship elements in their lives may also have greater endorsement of these cognitions and increased vulnerability to psychological distress. Alternatively, we cannot determine if YGBM who have greater symptoms of depression and anxiety may be more willing to endorse different types of relationships than those with lower symptoms. Similar findings among other population groups have found that romantic inauthenticity (incongruence between thoughts/feelings and actions within a relationship) are associated with depression, suicide ideation, and suicide attempts (Soller, 2014). Relational expectations of restrictions were the only construct negatively associated with depression. This finding supports our original hypothesis, as we thought that greater endorsement of relational restrictions would be associated with greater communication skills, where YGBM felt confident in expressing their boundaries, and possess greater self-determination. Among dyadic relationships, authors theorize that romantic rules and expectations are necessary in relationship dynamics such as honesty, time allocation, and conflict management (Jones & Gallois, 1989; Roggensack & Sillars, 2014). Using adolescent couples, Harper and Welsh, identified participants

who reported high in self-silencing, also reported poorer communication skills and reported greater depressive symptoms (Harper & Welsh, 2007). We support future research that directly explores how communication is associated with depression among single and partnered YGBM.

Taken together, our findings demonstrate unique associations between relational beliefs and expectations and how they may be protective or increase depression among YGBM.

Among our outcome of anxiety, we found significant associations between relational constructs of negative break ups, immediacy, and restrictions. All three were consistent with our hypotheses. For the construct of negative break ups, our finding supports previous research which found a positive association between negative break up appraisals and increased anxiety among single YGBM (Ceglarek et al., 2017). Additionally, our findings are consistent with larger extant literature that associates negative rumination with increased depressive and anxiety symptoms (Armey et al., 2009). For immediacy, we hypothesized a positive relationship with anxiety because it is possible that YGBM who have stronger endorsements of immediacy may also possess greater insecurities, or obsessive and compulsive thoughts. The aforementioned constructs have each been explored with association to anxiety, supporting our finding (Colonnesi et al., 2011; Goodwin, 2015; Romero-Sanchiz, Nogueira-Arjona, Godoy-Ávila, Gavino-Lázaro, & Freeston, 2017). Expectations of relational restrictions were negatively associated with anxiety, supporting our original hypothesis. Our interpretation of restrictions is based on constructs of commitment and communication. Extant literature among other populations has indicated an association between higher anxiety and lower sexual communication, and an association between relationship commitment and anxiety (Etcheverry et al., 2013; Montesi et al., 2013). We suspect that YGBM who report greater endorsement of relational restrictions may also be more open about their boundaries and may be better at communicating their needs and desires. As a result, these YGBM

may have less anxiety because they are more direct and self-assured. In general, the relationship between expressing emotion/communication has been explored with anxiety, and among adolescent couples, in relation to sexual communication (Montesi et al., 2013; Starcevic & Berle, 2006). Future research should explore these concepts further among YGBM as this population has higher rates of anxiety and may be less likely to receive communication skills as they relate to same-sex relationships.

Apart from relational constructs, factors of resilience and friend social support were both negatively associated with outcomes of depression and anxiety. A resilience perspective suggests that YGBM with stronger resilience have better mental health outcomes than YGBM with lower resilience. Our findings are consistent with prior research on the protective association between resilience and sexual minority individuals (Kwon, 2013; Lyons, 2015). Similarly, YGBM with stronger social support among friends also have higher outcomes of mental health than YGBM with lower social support. These findings are consistent with other samples of sexual minority youth and outcomes of mental health (Shilo & Savaya, 2011; Williams, Connolly, Pepler, & Craig, 2005). Taken together, both findings support public health interventions that promote social support and resilience building among YGBM to reduce mental health disparities.

Our research possesses several strengths and limitations. First, the cross-sectional data does not confer causality for our findings. Based on the malleable nature of changing cognitions it is important that future research employ longitudinal methods to explore how beliefs may change over time. Moreover, cognitions are informed by experiences, and we support longitudinal research that specifically examines experiences and cognitions. Second, our sample was based on a convenience sample of YGBM and may not be generalizable to all YGBM. Moreover, we believed it was important to include bisexual, given limited research on bisexual men and the

prevalence of health disparities among this population (Friedman et al., 2014). However, we did not want to combine bisexual men with gay men, to respect each identity. A limitation though is that our study question only asked about same-sex relational cognitions and did not account for opposite sex relationships. Next steps in this research could explore how relational cognitions may be similar or different among bisexual individuals with different relationship types. Moreover, racial/ethnic minority YGBM were not equally represented. Next steps in this research will be to explore these scales among varying ethnic and economic groups on outcomes of HIV risk. Further, our eligibility criteria may also limit generalizability, as participants were required to have access to the internet, as well as use a dating website in the past three months. Moreover, our findings may be subject to recall bias and social desirability bias. Future research should assess how experiences of discrimination or internalized homonegativity affect relational cognitions and outcomes of mental health. While our findings provide novel insights on how YGBM's relational cognitions are associated with mental health outcomes, mental health disparities are not limited to gay and bisexual men. We support further research assessing relational cognitions among mental health outcomes among other sexual and gender minority individuals. Lastly, bivariate analyses indicated significant difference between participants with missing data and participants that were included in our analyses. Thus, generalizability of our findings may be limited. We support further exploration of these constructs on other samples of YGBM to improve generalizability.

Despite these limitations, our study contributes to the limited understanding of YGBM relational cognitions on mental health outcomes, and has implications for future research. Relational expectations of negative break ups and relational restrictions were significant for both outcomes of anxiety and depression among. Previous literature has indicated that YGBM often engage in same-sex relationships and are likely to experience break ups (Brian Mustanski et al.,

2011). These break ups may be especially damaging for the mental health of YGBM because these may result in a loss of social support to individuals who already have limited social supports (L. Diamond, 2003). Based on our findings, we support interventions that facilitate discussions among YGBM about break ups so YGBM are better prepared to cope with potential breakups, or even support groups that YGBM can engage with during a break up, promoting emotional regulation. Our findings on relational restrictions support interventions that promote communication skills within a romantic relationship, and building relationship boundaries. Moreover, our finding of immediacy and anxiety supports interventions that focus on healthy relationship development, handling emotions in early relationships, and navigating obsessive or impulsive thoughts. In general, interventions focused on discussions about romantic relationships in general may be useful for YGBM who may lack these important conversations (Greene et al., 2015), which may help normalize relationships and help to develop healthy relational beliefs and expectations.

Overall, our research supports the importance of relational cognitions as significant factors for mental health outcomes. While previous research is limited in its exploration of relational cognitions among other populations and health outcomes, our novel findings support a greater emphasis on cognitions among YGBM. As adolescence is a time marked by high rates of relationship engagement and mental health disparities, our findings may better support single YGBM before engaging in relationships, and reducing depression and anxiety. In all, considering the role of relational beliefs and expectations on mental health outcomes provides a nuanced approach to address mental health disparities among this marginalized population.

6.0 CONCLUSION

6.1 SUMMARY OF MAIN FINDINGS

The results from this study contribute to growing literature on relational cognitions among YGBM in multiple ways. These analyses identified relational cognitions specific to YGBM, testing these constructs on outcomes of HIV risk, anxiety, and depression. Our findings demonstrate the importance of relational cognitions on health outcomes for YGBM and demonstrate the need for future research to incorporate relational cognitions in HIV and mental health prevention.

The first analysis applied factor analysis to items about relational expectations and beliefs, specific to YGBM. These items were developed from qualitative interviews with YGBM and these constructs were asked to a larger audience of YGBM as part of a cross-sectional online study. Applying exploratory and confirmatory factor analysis, our study identified six constructs on relational expectations (restrictions, negative break ups, optimism, cheating, masculine and gender norms, and immediacy) and two constructs on relational beliefs (sex beliefs and equality). All subscales demonstrated Cronbach's alpha reliability above 0.7, and content validity. This is the first study to develop relational constructs specific to YGBM.

The second analysis utilized the developed subscales from the previous analysis to test for HIV risk among YGBM, measured in number of partners for condomless anal sex. We found that YGBM with greater relational expectations of negative breakups were negatively associated with I-CAS (AOR=0.91; 95% CI: 0.85, 0.97) and R-CAS (AOR=0.92; 95% CI: 0.87, 0.97). YGBM with greater expectations of optimism were negatively associated with R-CAS (AOR=0.93; 95%

CI: 0.88, 0.97), and positively associated with I-CAS (AOR=1.22; 95% CI: 1.15, 1.30). Moreover, YGBM with greater expectations of cheating were positively associated with R-CAS (AOR=1.20; 95% CI: 1.14, 1.26) and immediacy was negatively associated with R-CAS (AOR=0.92; 95% CI: 0.88, 0.97). Among relational beliefs, YGBM with greater endorsement of sex beliefs had a negative association with R-CAS (AOR=0.81; 95% CI: 0.74, 0.89), and beliefs about equality (AOR=0.74; 95% CI: 0.67, 0.82) were negatively associated with R-CAS.

Finally, our third analysis we utilized the developed subscales from paper 1 to test for associations to mental health outcomes of anxiety and depression among YGBM. We found that YGBM with greater relational restrictions (β= -.06) had a negative association with depression, while expectations of negative break ups (β= .34) and optimism (β= .05) were positively associated with higher depressive scores. Among relational beliefs, beliefs about equality (β= .06) were positively associated with higher depressive scores. On our anxiety outcome, expectations of restrictions (β= -.17) were negatively associated with higher anxiety scores. Alternatively, we found the constructs of negative break ups (β= .31), and immediacy (β= .06) positively associated with higher anxiety scores. Relational beliefs were not significant for anxiety.

6.2 STRENGTHS AND LIMITATIONS

In addition to the strengths and limitations identified in each dissertation paper, this dissertation possesses strengths and limitations as a whole. First, data was cross-sectional and we cannot confer causality among findings. Second, our study used a convenience sample of YGBM, and may not be generalizable to all YGBM. Moreover, our analysis of relational cognitions was only specific to same-sex relationships and findings for bisexual men were limited. We support

further research among racial/ethnic minority YGBM and bisexual men to also assess opposite-sex relationships. Third, based on SCT, cognitions are often changing, based on experience and environment. We support further research to assess how relational beliefs and expectations may change over time among YGBM.

Despite these limitations, our study was able to recruit a large geographically diverse national sample of YGBM. Our relational belief and expectations items were also developed from qualitative interviews with YGBM, which improves the content validity of our findings. Lastly, our study was the first to assess relational beliefs and expectations specific for YGBM. In addition to identifying nuanced constructs such as masculine and gender norms, and equality, our study also assessed how these constructs are associated with health outcomes of HIV and mental health. Together, our analyses build on scant literature on relational cognitions and HIV and mental health among YGBM and build a groundwork for future analyses in these areas.

6.3 FUTURE INTERVENTIONS AND IMPLICATIONS

The analyses completed in this dissertation contribute to public health research on YGBM health disparities. By identifying relational subscales specific to YGBM and testing these subscales on prevalent health disparities among this population, these analyses demonstrate the importance of relational beliefs and expectations on health outcomes. As such, our findings have significant public health implications for future interventions to reduce health disparities among YGBM.

One intervention that may be useful for YGBM is to provide workshops or online discussions about romantic relationships, relational beliefs, and expectations. Prior research among YGBM indicate that discussions about same-sex relationships are often ignored, in contrast

to heterosexual relationships (Greene et al., 2015). This neglect may leave YGBM less prepared to handle romantic relationships, or the intense emotions that coincide with relationships. Moreover, we support interventions that focus on emotional regulation, coping with stress, resilience, and building self-esteem. Interventions like these are informed by our significant findings on the construct of negative break ups on HIV risk and mental health (anxiety and depression). Additionally, it is important that YGBM have safe spaces for relationships to develop and grow. We support interventions such as Mpowerment, which promote social interaction among YGBM and include discussions about sex, drugs and relationships (Kegeles et al., 2012).

While our study focused on single YGBM, the implications of this study go beyond the individual. As most YGBM will engage in romantic relationships throughout their life, our findings can better inform YGBM before they are relationships so that experiences within relationships are smoother, and stronger. Our findings complement previous research on dyadic relationships among YGBM and provide a more complete understanding for public health researchers before and during relationships.

6.4 FUTURE RESEARCH AGENDA

This research lays the groundwork for continued research on this topic, and we propose areas of interest to pursue. First, our study utilizes social cognitive theory to theorize relational beliefs and expectations among YGBM, yet we could not test this theory. This is relevant as social context may explain relational beliefs and expectations among YGBM. We suggest future research further explore how social environment may inform relational cognitions, such as experiences of discrimination, internalized homophobia, or the effect of LGB-affirmative or harmful policies.

Second, we suggest exploring how relational beliefs and expectations differ or are similar to cognitions among heterosexual individuals. Further, while our findings are relevant for YGBM, we suggest future research among other sexual minority individuals. Expanding our understanding of relational beliefs and expectations among other sexual minorities may further highlight disparities between sexual minorities and heterosexual individuals. Third, our study treated relational beliefs and expectations separately as a first step to identify constructs from each larger construct. Next steps in this research could apply structural equation modeling to explore how beliefs and expectations inform each other or overlap.

6.5 ADVOCACY FOR RELATIONAL COGNITIONS IN PUBLIC HEALTH

Cognitions are a natural aspect of human nature, which inform our identity, beliefs and perceptions about the world. Romantic relationships are a significant aspect of individuals' lives, for adolescence when relationships may inform development. Together, these aspects have mainly been explored among heterosexual individuals, with limited knowledge specific to YGBM. As YGBM may encounter stigmatizing attitudes about their sexual orientation and same-sex relationships, their cognitions about relationships may be shaped differently than their heterosexual peers. This dissertation identified relational cognitions specific to YGBM and provides insight on the importance of relational cognitions among YGBM on prevalent health outcomes of HIV risk and mental health. We advocate to incorporate relational cognitions in future public research and interventions seeking to reduce disparities among YGBM. Finally, a greater understanding of cognitions may better inform future efforts aimed at reducing health disparities and improving well-being among YGBM.

APPENDIX A: HYPOTHESIZED RELATIONAL BELIEFS FACTORS

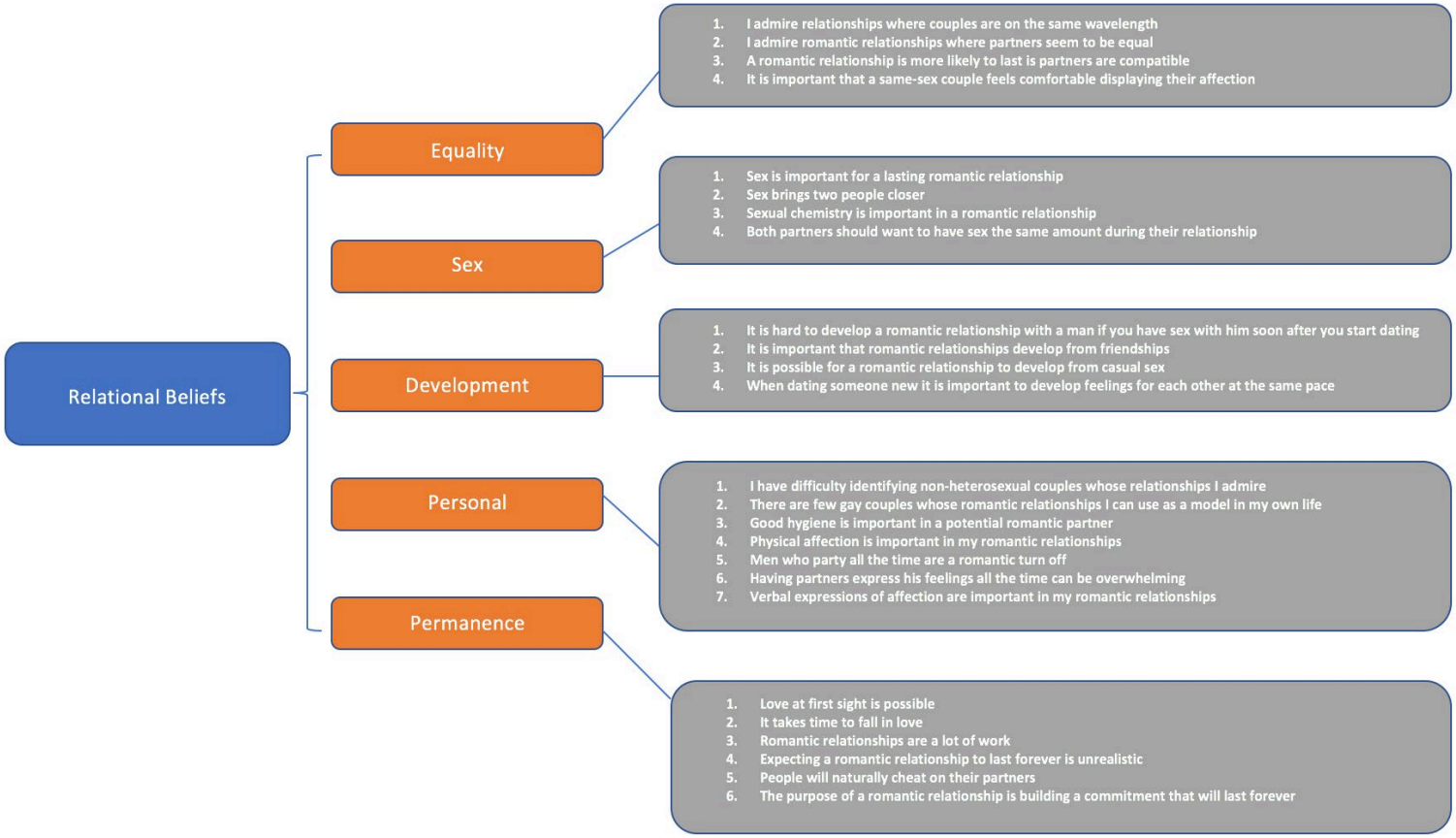

Figure 6-1: Hypothesized Relational Beliefs Factors

APPENDIX B: HYPOTHESIZED RELATIONAL EXPECTATION FACTORS

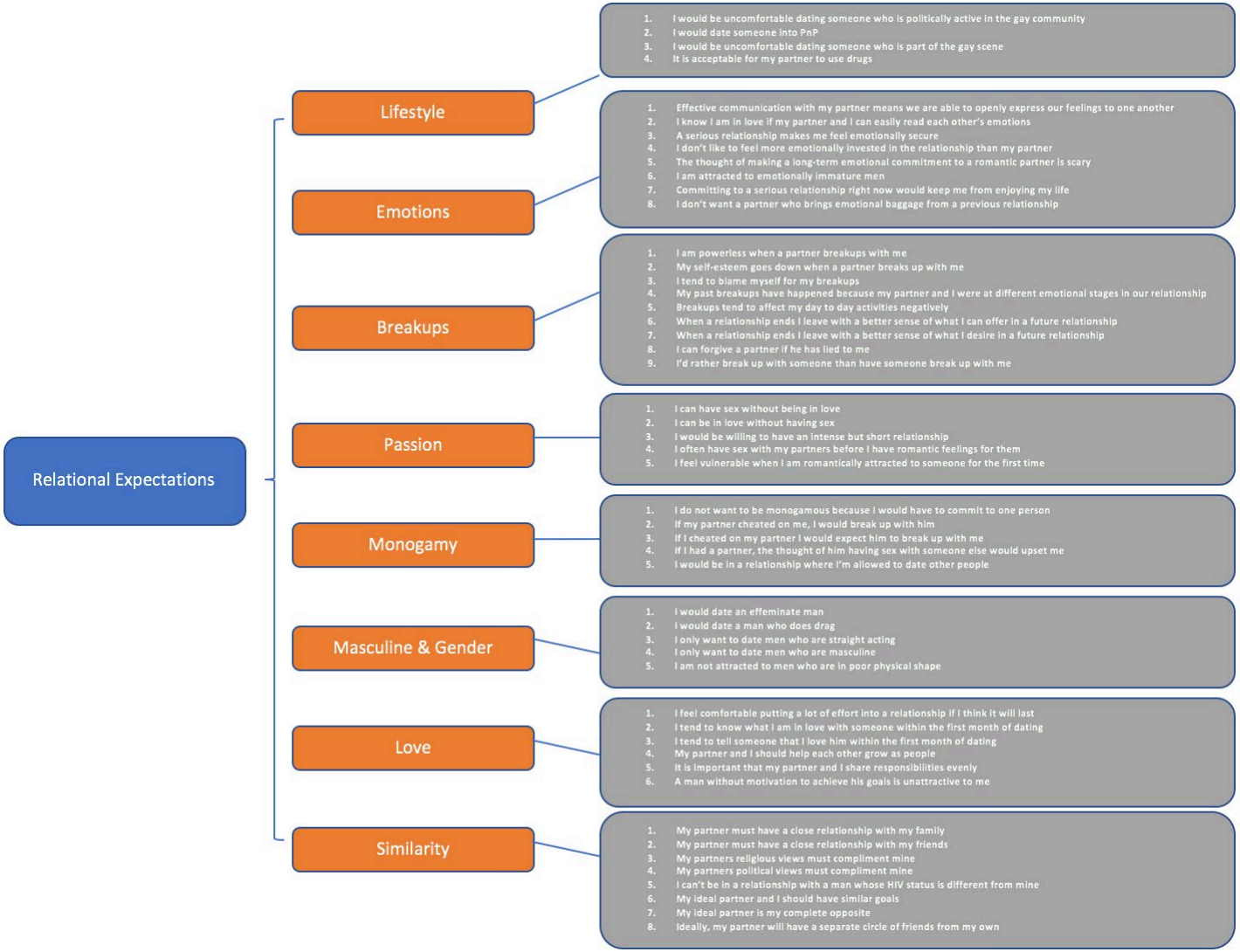

Figure 6-2: Hypothesized Relational Expectation Factors

APPENDIX C: FINAL RELATIONAL BELIEF ITEMS AND UNDERLYING CONSTRUCTS

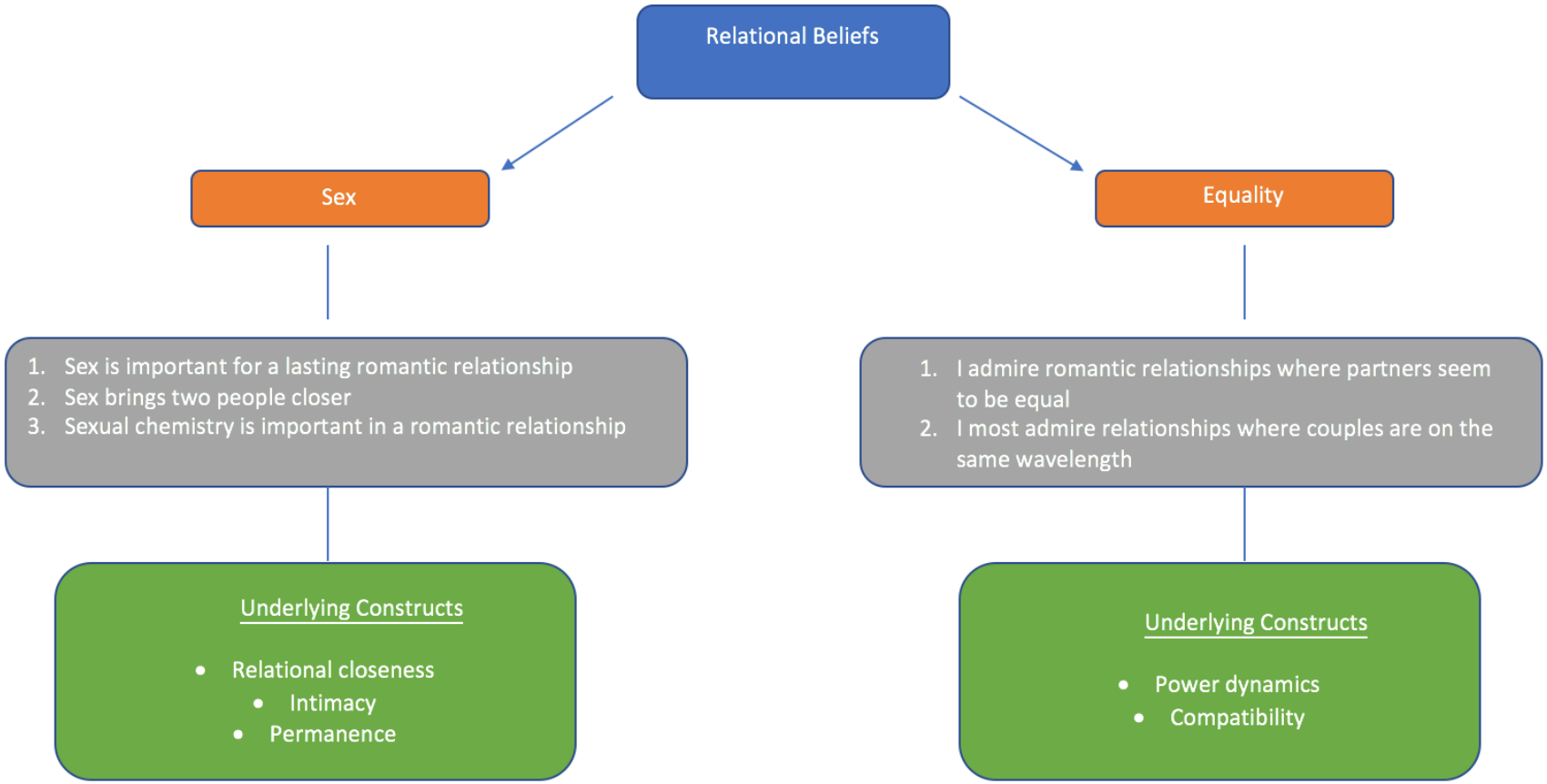

Figure 6-3: Final Relational Belief Items and Underlying Constructs

APPENDIX D: FINAL RELATIONAL EXPECTATION ITEMS AND UNDERLYING CONSTRUCTS

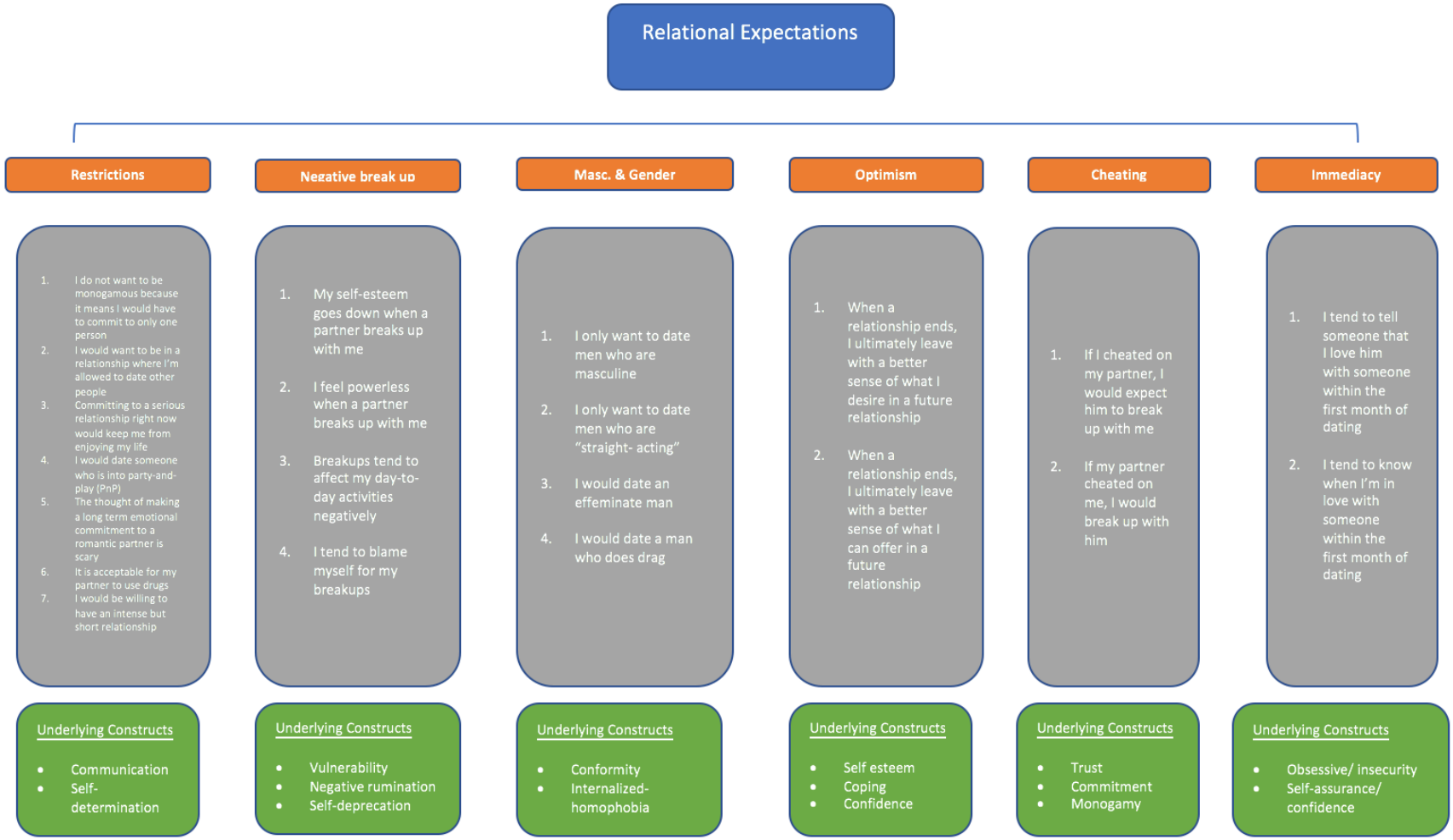

Figure 6-4: Final Relational Expectation Items and Underlying Constructs

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xiety%2C+depression%2C+and+obsessive-compulsive+disorder&rft.jtitle=Dialogues+in+clinical+neuroscience&rft.au=Goodwin%2C+Guy+M&rft.date=2015-09-01&rft.eissn=1958-5969&rft.volume=17&rft.issue=3&rft.spage=249&rft_id=info%3Apmid%2F26487806&rft.externalDocID=26487806&paramdict=en-US U7 - Journal Article, 17(3), 249.

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