Links Between Depressive Symptoms, Sexual Communication, and Sexual Satisfaction Across Three Years

by

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Abstract

Guided by a relational developmental systems perspective, stress generation hypothesis, and gender relations theory, this thesis examined two major research questions: (1) What are the longitudinal associations between self-reported depression symptoms, sexual communication, and sexual satisfaction? and (2) Are there gender differences in the associations between depression, sexual communication, and sexual satisfaction? To accomplish this goal, three waves of longitudinal data gathered from 959 participants in the German Family Panel (pairfam), a multi-disciplinary study with annual survey data collected from a national sample, were analyzed using multiple-group cross-lagged panel models. The results showed depressive symptoms predicted lower sexual communication and sexual satisfaction in the future, but neither sexual communication nor satisfaction predicted future depressive symptoms. Sexual communication and satisfaction reinforced each other over time; higher sexual communication predicted higher sexual satisfaction and sexual satisfaction predicted more frequent sexual communication. Whether the participant was male or female did not moderate any associations in the model. These results highlight the linked nature of individual mental health and couple sexuality and points to the importance of targeting individual mental health as a key method to prevent negative sexual outcomes.

Key words: Couples, Mental Health, Depression, Sexual Communication, Sexual Satisfaction

Preface

This thesis is an original work by Jennifer Yurkiw. No part of this thesis has been previously published. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project Name “Family Relations in the German Pairfam Study”, No. Pro00060173, October 11, 2016.

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Introduction

Depression is among the most commonly diagnosed mental illnesses in Canada, with an estimated 2.8 million Canadians reporting a mood disorder in 2018, and 11.3% of Canadian adults having met the criteria for depression at some point in their lives (Statistics Canada, 2020; Pearson, Janz, & Ali, 2013). Depression is characterized by inordinately low mood that significantly impedes the functioning of an individual's daily life. Even sub-clinical depressive feelings can negatively impact functioning, including with one's intimate partner. A large literature has documented the negative impact of depressive symptoms on couple relations, finding adults who experience depressive symptoms report lower relationship satisfaction, increased rates of conflict (Pankiewicz, Majkowicz, & Krzykowski, 2012) and marital stress (Davila, Bradbury, Cohan, & Tochluk, 1997), as well as worse supportive dyadic coping (Johnson, Galambos, Finn, Neyer, & Horne, 2017) within intimate partnerships. Given the many ways in which depressive symptoms negatively impact couples, it is not surprising that scholars have also investigated associations between depressive symptoms and couple sexuality (Papp, Goeke-Morey & Cummings, 2007; Whisman, 2007).

Individuals who experience depression are more likely to experience sexual problems, but the literature on mental health and sexual functioning has largely focused on medically-diagnosed sexual dysfunction (e.g., vaginismus; Pankiewicz et al., 2012). The small body of research that explored non-clinical sexual outcomes found that depressive symptoms are associated with sexual problems, including feelings of concern regarding one's sex life as well as reduced sexual satisfaction (Scott, Sandberg, Harper, & Miller, 2012; Ventus et al. 2017). For example, a longitudinal study found that depression predicted increases in future feelings of concern, shame, and inadequacy regarding sexuality (Ventus, Gunst, Karna, & Jern, 2017).

While it is clear that symptoms of depression are associated with reduced sexual satisfaction, less research has considered potential mechanisms that may link depression with reduced sexual satisfaction.

My thesis is informed by relational developmental systems theory (RDS; Lerner, Agans, DeSouza, & Gasca, 2013) and gender relations theory (Ferree, 2010) to address two research questions: (1) What are the longitudinal associations between individuals' self-reported depression symptoms, sexual communication (communication regarding sex, including discussion of sexual preferences or concerns; Rancourt, Rosen, Bergeron, & Nealis, 2016), and sexual satisfaction? (2) Do the associations between depression, sexual communication, and sexual satisfaction differ for men and women? I answer these research questions using longitudinal survey data gathered annually for three years from 959 participants in the German Family Panel (pairfam) study (Huinink et al., 2011).

Background

Theoretical Frameworks

Relational Developmental Systems Perspective. This thesis is informed by a relational developmental systems approach, which emphasizes human development as arising from the mutually influential relationships between individuals and their contexts across time (Lerner et al., 2013). RDS is a high-level meta-theoretical framework that positions individual development from a relational perspective, contending that patterns of behavior "emerge from their specific arrangement in a particular system and from the transactions among parts made possible only by that arrangement" (Whitchurch & Constantine, 1993, p. 329). Applied to the issue of mental health issues, this allows us to understand how micro-level (individual) concerns, such as depression, have significant impacts on system-level functioning, such as that of the couple dyad subsystem (Allen & Henderson, 2017), and vice versa.

A RDS perspective includes the notion of holism, which posits that a system is a *cohesive unit*, of which a unified analysis is required to truly grasp the complex impacts of an issue, and cannot be understood by studying its individual components in isolation (Overton, 2014; Whitchurch & Constantine, 1993). From this perspective, psychological concerns may place a burden on an intimate partnership, contributing to conflict and distress or, conversely, dynamics within the couple relationship may influence individual mental health. Depressive symptoms within an individual could ripple out to relational functioning including sexuality, just as dynamics within one's intimate relationship, including the nature of the couple's sex life, may lead to feelings of depression. The literature regarding depression in intimate relationships supports this bidirectional association, as depression has been shown to increase relationship dissatisfaction and relationship dissatisfaction has also been shown to act as a trigger for the

development of depression (Baucom, Whisman & Paprocki, 2012; Whisman, 2007; Whisman, Robustelli, and Labrecque, 2018). Applied to this study, a RDS perspective anticipates that mental health would be consequential for future couple sexuality, including sexual communication and satisfaction, and that couple sexuality would also influence mental health over time. This anticipated relationship between sexuality and mental health demands investigation that is longitudinal in nature.

The expectation for depressive symptoms to be bidirectionally linked to sexual communication and satisfaction aligns with the extant literature and theory related to the impact of depression on social functioning. For example, the stress generation hypothesis (Hammen, 1991, 2006) posits that the experience of depression may lead people to act in ways that further exacerbate stress, which may subsequently increase future depression. Applied to intimate partnerships, individuals who experience depressive symptoms may create or exacerbate relationship stress, which may then prolong or worsen depressive symptoms (Goldfarb & Trudel, 2019). Within the context of the current study, this could mean, for example, that individuals who already experience depressive symptoms may find that they withdraw socially from their intimate relationship, resulting in lower levels of sexual communication, which in turn reduces their sexual satisfaction. Studies have indicated that couple support and communication can be negatively impacted by depressive symptoms, such as a study from Gana, Saada, Broc, Koleck, & Untas (2017) who interviewed 198 heterosexual couples and found that depressive symptoms predicted less supportive dyadic coping (see also Johnson, Galambos, Finn, Neyer, & Horne, 2017). Thus, it is tenable that an individual who is experiencing depressive symptoms may withdraw socially (Kennedy, 2008; Segrin & Rynes, 2009), including reduced sexual

communication with their partner, which could ultimately reduce sexual satisfaction. Of course, low sexual satisfaction may reinforce future symptoms of depression, creating a vicious cycle.

Gender Relations Theory. This thesis is also grounded in gender relations theory (Allen & Henderson, 2017; Ferree, 2010). Consistent with RDS, a gender relations perspective seeks to explore the ways in which individuals and groups are impacted by interactions within and between contexts, and focuses on the ways in which the experience of gender intersects with the various environments in which an individual engages throughout the lifespan (Allen & Henderson, 2017; Ferree, 2010). Applied to family science, gender relations theory allows researchers to explore unequal power arrangements that impact families through the experience of gender (Allen & Henderson, 2017).

For example, the concept of hegemonic masculinity is of particular relevance to the current study, which is "the practice that defines men's roles, expectations, and identities as superior to women" (Allen & Henderson, 2017, p. 153) and emphasizes the notions of success, dominance, aggression, strength and power as superior within intimate relationships. Hegemonic masculinity considers the ways in which individuals *perform gender* throughout their lives, through socialization to uphold the traits and characteristics that are socially established as either male or female (West & Zimmerman, 1987). A large body of research points to potential differences in the ways in which males and females think and act in relation to sex. For example, research has shown that males tend to have more frequent thoughts about sex (Peplau, 2003) and more sexual partners than females (Petersen & Hyde, 2011). Applied to this thesis, a gender relations perspective prompts consideration of the ways in which widespread societal conditioning of males as the more virile sex may impact the effects of sexual concerns. Scholars have shown that males have a higher sex drive, or motivation for sex, than females, on average

(Baumeister, Catanese, & Vohs, 2001). Therefore, it is possible that an unsatisfying sexual relationship may be particularly depressing for males, as failure to achieve a satisfying sex life represent a significant loss in an important facet of their lives or may also be seen as a threat to societally endorsed notions of what comprises one's masculinity. A study from Gabb (2019) showed that gendered differences in the relationship work of maintaining sexual intimacy still place females in a position where they more frequently accommodate or compromise for their male partners, through behaviours such as engaging in sex more frequently than they desire. Such gendered expectations place females in the role of managing and maintaining relationship quality (Dindia & Baxter, 1987), therefore, problems in the relational domain, such as low sexual satisfaction, may threaten societally endorsed notions of the female role and thus lead to increased depressive symptoms.

Empirical evidence has long supported the analysis of gender in experiences of depression. The first study that identified a higher prevalence of depression in women compared to men found that twice as many women experience depression "in clinical and community samples" (Weissman & Klerman, 1977). A study reporting results of the first representative Canadian epidemiological survey of mental health analyzed gender differences of symptoms in individuals with Major Depressive Disorder and found that women reported significantly more symptoms of depression than men (Romans, Tyas, Cohen, & Silverstone, 2007). Women are more likely to be diagnosed with a mood disorder, with a 2013 study indicating that 5.8% of women had experienced depression in the past year, compared to 3.6% of men (Pearson, Janz, & Ali, 2013). The stress generation hypothesis would suggest that if females are more likely to experience feelings of depression, their social impairment may be greater compared to males. Given the statistics which show women are more prone to depressive symptoms compared to

men, it is possible that depressive symptoms may be more strongly intertwined with sexual communication and satisfaction for women.

Some studies have examined associations between depressive symptoms and sexual satisfaction separately for men and women (e.g., Morgan, Durtschi, & Kimmes, 2018) or have included gender as a covariate in the analyses (e.g., Scott et al., 2012). However, past longitudinal studies have not empirically tested differences between males and females in the links among depressive symptoms, sexual communication, and sexual satisfaction. Altogether, these considerations necessitate an exploration of gender differences in how depression is associated with sexual outcomes; therefore, I test whether gender moderates associations between depressive symptoms, sexual communication, and sexual satisfaction.

Literature Review

Intimate relationships are the "primary context in which adults express and manage personal distress" (Zaider, Heimberg & Iida, 2010, p. 163). With more than one in ten adults experiencing depression in their lifetimes (Statistics Canada, 2020), it follows that these individuals will rely on the support and engagement of their romantic partner(s) to manage their psychological well-being. The literature indicates that those who suffer depression may have increased rates of conflict and lower levels of relationship satisfaction within close interpersonal relationships, such as that of a spouse or partner (Goldfarb & Trudel, 2019; Morgan et al., 2018). A review of the literature on the relationship between marital quality and depression concluded that cross-sectionally, depression and marital satisfaction are negatively associated: higher levels of marital dissatisfaction are associated with higher levels of depressive symptoms. A systematic review from Atlantis and Sullivan (2012) supports a bidirectional relationship between sexual dysfunction and depression. They reported that individuals diagnosed with depression were 50%

to 70% more likely to develop sexual dysfunction and individuals with sexual dysfunction were 130% to 210% more likely to develop depression (Atlantis & Sullivan, 2012). However, less research has offered exploration of the ways in which marital satisfaction and depression are linked longitudinally, which limits our ability to conclude directionality of the relationship (Goldfarb & Trudel, 2019).

In terms of how depression is associated with sexuality, most literature has examined medically diagnosed sexual dysfunction, such as Vaginismus, Premature Ejaculation and Erectile Dysfunction (Derogatis, Meyer, & King, 1981; Forbes, Baillie & Schniering, 2016; Ventus et al., 2017). A recent study from Forbes et al. (2016) sought to explore the ways in which depression was associated with clinical sexual disorders. The authors did not find a longitudinal association between depression for either male or female sexual disorders, but their results indicated that subclinical sexual problems, such as sexual distress (for women) were more closely related to depression than other sexual problems, such as sexual pain (Forbes et al., 2016). This provides some evidence for the comorbidity between depressive and sexual issues, and points to non-clinical problems as a plausible cause for concern.

Several studies assessing individuals and couples who experience sexual difficulties show associations between higher levels of depression and higher levels of sexual distress in both males and females (Dennerstein et al., 2008; Hayes et al., 2008; Ventus et al., 2017). For example, Ventus et al. (2017) conducted a longitudinal study of 985 men and found that depression predicted sexual distress, such as feelings of concern, shame, or inadequacy regarding one's sex life, over time. The authors posit these findings may be due to a multitude of factors, including the link between depression and sexual problems, such as lower sex drive and arousal (Kennedy & Rizivi, 2009; Ventus et al., 2017). The reverse pathway was tested, and sexual

distress also predicted higher levels of depression at a later time point (Ventus et al., 2017). These results regarding the directionality of the relationship between depression and sexual distress indicate that sexual functioning and symptoms of depression may be reciprocal in nature. Taken together, these studies emphasize the importance of understanding potential sub-clinical sexual outcomes that could be impacted by mental health issues such as depression.

Sexual satisfaction. Sexual satisfaction has important implications for relationship well-being. A recent survey of American couples asked participants to rank the most important contributors to a satisfying marriage; having a happy sexual relationship was endorsed as the second most important element of a satisfying marriage (next to faithfulness), ranking above having adequate income, sharing common interests, and equality in household chores (Taylor, Funk, & Clark, 2007). Research has long supported this notion, finding sexual and relationship satisfaction coevolve over time (Byers, 2005; Fallis, Rehman, Woody, & Purdon, 2016; McNulty, Wenner, & Fisher, 2016; Vowels & Mark, 2020). As a robust contributor to satisfying couple relations (not to mention one's overall life satisfaction; Schmiedeberg, Huyer-May, Castiglioni, & Johnson, 2017), insight into the factors that may undermine healthy couple sexuality is critical.

A satisfying sex life is comprised of a multitude of factors, both personal and relational. Among the most widely studied contributors to a satisfying sex life include sexual frequency (McNulty et al., 2016; Russell & McNulty, 2011), longer time spent in each sexual encounter (Blair & Pukall, 2014), employing sexual techniques to enhance the quality of sexual interactions and increase the frequency or orgasm for both partners (Haning et al., 2007), as well as partner responsiveness including feelings of connectedness and strong communication (Byers, 2005; Birnbaum et al., 2016; Schoenfeld et al., 2016). In regard to specific techniques couples can

employ to enhance sexual interactions, behaviors prior to and following a sexual encounter are important (Frederick et al., 2017; Muise, Giang, & Impett, 2014). Couples who reported specific tasks preceding a sexual encounter that may 'set the mood' including lighting candles and having "sexy talk" with one's partner (Frederick et al., 2017) as well as taking time to engage in post-sex affectionate exchanges, like cuddling and talking (Muise, Giang, & Impett, 2014), reported more satisfying sexual encounters.

It is not only specific components of the sexual encounter, but also factors outside of the bedroom that impact sexual satisfaction. For example, studies have examined the link between daily household chores and sexual satisfaction (Johnson, Galambos, & Anderson, 2016; Hajek, 2019). Johnson, Galambos, and Anderson (2016) studied 1,338 heterosexual couples across 5 waves of data to explore whether the division of household labour influenced sexual satisfaction and frequency. Results indicated that when male partners' contributed fairly to household chores, the couple reported higher sexual frequency *and* satisfaction (Johnson, Galambos, & Anderson, 2016). From a gender relations perspective, this indicates the importance of perceived gender equality in tasks that influence relational functioning, such as housework.

Past research also explored potential differences in sexual satisfaction between males and females, yielding mixed results. A meta-analysis from Oliver and Hyde (1993) combined data from papers published between 1974 to 1990 and found no gender differences in reported sexual satisfaction. However, a more recent meta-analysis from Petersen and Hyde (2011) spanning the years 1993 to 2007 found that males reported higher levels of sexual satisfaction than females. The authors of the recent meta-analysis propose that the time lag between these studies may explain, in part, the disparity between results; perhaps women are becoming increasingly confident or empowered to discuss (honestly) their sexual lives (Petersen & Hyde, 2011),

highlighting the potentially important role of sexual communication in achieving a satisfying sex life. Additionally, it is possible that women are being educated and socialized to expect a higher level of sexual satisfaction than in the past. Either way, these results further emphasize the importance of assessing potential differences in the associations of depressive symptoms, sexual communication, and sexual satisfaction between males and females in this thesis.

Communication is another component of relational functioning which has been a target of research regarding the components of positive sexual relationships. For example, Byers (2005) explored the longitudinal links between relationship and sexual satisfaction in long-term sexual relationships and found that higher quality communication with one's partner predicted greater future sexual satisfaction while controlling for baseline relationship and sexual satisfaction. In their study of 105 heterosexual newlywed couples, Schoenfeld et al. (2016), found that both partners rated their sexual satisfaction higher if they had more positive pro-social communication patterns, regardless of their level of sexual frequency. Altogether, these factors suggest that communication and feelings of connectedness play a key role in satisfying sex lives for couples.

Depressive Symptoms and Sexual Satisfaction

Scholars have also explored the link between depressive symptoms and sexual satisfaction (Forbes et al., 2016; Ventus et al., 2017), with cross-sectional studies finding depressive symptoms are associated with lower sexual satisfaction for both males and females (Davison, Bell, LaChina, Holden, & Davis, 2009; Nicolosi, Moreira, Villa, & Glasser, 2004). In a study of 421 women, participants who identified themselves as being "dissatisfied" with their sexual life also reported lower levels of general well-being and higher reports of depressive symptoms (Davison et al., 2009). Another study by Nicolosi and colleagues (2004) found that for men experiencing Erectile Dysfunction, depressive symptoms were linked to decreased sexual

activity and satisfaction. These cross-sectional studies indicate an association between sexual satisfaction and depression for men and women, which requires further longitudinal analysis to tease out potential directionality of their link.

A recent study explored whether sexual satisfaction impacts depression over time (Morgan et al., 2018). In their study of 1, 876 heterosexual couples from the pairfam study (the same data used in this thesis), Morgan et al. found that for both males and females, higher sexual satisfaction scores were associated with decreased depressive symptoms across time. The authors posit that the results indicate that sexual satisfaction could be a potential target area for therapies in order to potentially positively influence the trajectories of depressive symptoms (Morgan et al., 2018). Less research has considered factors that may link depressive symptoms with sexual satisfaction, which prompts the question: if sexual satisfaction is a subjective appraisal, what specific constructs or behaviours might be possible targets for intervention?

Based on prior research, it appears that there may be particular contextual conditions under which the links between depression and sexual satisfaction vary. The study from Morgan et al. (2018) indicated that relationship satisfaction also acted as a buffer against worse depression trajectories: depressive symptoms may not increase when sexual satisfaction is low if the overall satisfaction with the relationship remains high. Research from Russell and McNulty (2010) also found that couples sexual relationships can be a protective factor against the influence of high in negative affectivity, a personality trait commonly associated with depression (Spijker, De Graff, Oldehinkel, Nolen, & Ormel, 2007). They found that couples experienced lower relationship satisfaction when their partners scored high in negative affectivity, except when the couple reported having sex frequently (Russel & McNulty, 2010). While these studies provide context for the ways in which depression and sexuality may be linked in couples, less

research, however, has considered potential mechanisms that may link depressive symptoms with sexual satisfaction.

Couple communication is a potential mediating variable between depression and sexual outcomes which has been explored in one cross-sectional study of older adult mixed-sex couples (Scott et al., 2012). The authors found that depression predicted worse communication between partners (e.g., lower levels of emotional expression and withdrawal from problem solving), which then predicted lower sexual satisfaction for both men and women (Scott et al., 2012). Contrasting their finding with prior research that pointed to the impacts of psychological wellbeing on sexual outcomes (Nicolosi et al., 2004), Scott et al. did not find *direct* associations between depression and sexual satisfaction for older adults These results call for more detailed examination of communication as a key variable which may impact the associations between depression and sexual satisfaction.

Sexual communication. Communication regarding sexual matters, such as disclosures about sexual preferences or sexual concerns (Rancourt, 2016), represents a mechanism that may link depressive symptoms and sexual satisfaction. Identifying factors that impact sexual communication is important based on past research demonstrating that communication fuels feelings of intimacy (Reis & Shaver, 1997) and that sexual communication is an integral part of relationship satisfaction as well as a satisfying sex life (Cupach & Comstock, 1990; Frederick et al., 2014; Jones, Robinson, & Seedall, 2018; Mark & Jozkowski, 2013; Montesi et al., 2010; Rancourt et al., 2016). Importantly, sexual communication represents a specific aspect of sexual relationships that can be targeted for intervention to improve both sexual and relational satisfaction. While it has been shown to be critical for positive sexual relationships, research

indicates that often people do not communicate openly with their partners about sexual needs and wants (Theiss & Estlein, 2014).

Cupach and Comstock (1990) explored the links between sexual communication, sexual satisfaction, and dyadic adjustment (a broad construct reflecting overall relationship quality) in a sample of 402 married university students. The authors found that higher levels of sexual communication were associated with higher levels of sexual satisfaction and marital adjustment (Cupach & Comstock, 1990). Various cross-sectional studies report similar findings, including that of Byers and Demmons (1990) which found that sexual communication was related to higher sexual satisfaction: the more that partner's engaged in sexual self-disclosure (expressing preferences in regard to specific sexual behaviours), the more satisfied they reported being in their sexual relationships. Their analyses highlighted two potential avenues through which this association may manifest: sexual communication may lead to more positive sexual interactions or sexual communication may increase overall relationship satisfaction, ultimately bolstering sexual satisfaction (Byers & Demmons, 1990). Additionally, in their study of 76 heterosexual cohabiting couples, Purnine and Carey (1997) found that when participants accurately understood their partners sexual preferences, they also experienced significantly higher sexual satisfaction. Importantly, their analysis also explored potential differences between male and female partners and found men's understanding of their partner's sexual desires was positively related to *both* partner's reports of sexual adjustment, however, women's understanding of their partner's sexual preferences only correlated with their own satisfaction (Purnine & Carey, 1997). These considerations also highlight the importance of controlling for sexual frequency and relationship satisfaction in the analysis of sexual communication and satisfaction.

A more recent study on sexual communication is particularly relevant to this thesis. Among couples in which the female partner was diagnosed with a vaginal pain disorder, Rancourt and colleagues (2016) also found higher sexual communication was associated with higher sexual satisfaction. Importantly, this study also explored the psychological impacts of sexual communication on couples, showing that greater sexual communication was associated with lower depressive symptoms (Rancourt et al., 2016). Taken together, these results support further exploration in non-clinical, community-based samples of longitudinal associations among sexual communication and sexual satisfaction and highlight depressive symptoms as a potentially important area of influence.

Importance of Intimacy for Young Adults

It is particularly interesting to assess the links between depressive symptoms and sexual outcomes among young adults, the age group targeted in this thesis (participants were aged 25 to 29 years at baseline and surveyed across three years). The establishment of successful intimate relations has long been posited as an important development task in young adulthood. Erikson's theory of psychosocial development outlines eight psychosocial stages through which individuals progress across the life course (Erikson, 1997; Syed & McLean, 2018). Young adults enter the "intimacy versus isolation" stage during which developing strong intimate bonds is a key developmental task that forms the foundation of strong interpersonal relationships throughout one's adult life (Syed & McLean, 2018). In particular, the achievement of intimacy requires the establishment of effective communication skills (Rosenthal, Gurney, & Moore, 1981). The intimacy process model explains the experience of intimacy as feeling validated, cared for, and understood by one's partner following the disclosure of personal information (Reis & Shaver,

1987). Thus, intimacy requires that one partner has the fortitude to make a disclosure and the other partner must receive the disclosure and enact a sensitive response.

Past research has applied Erikson's stages of development to the exploration of intimacy and communication in couples. Prager (1989) studied a sample of 49 couples to explore how intimacy development (capacity for commitment and depth) would impact the levels of self-disclosure with their partner. Individuals who scored higher levels of self-disclosure with their partners, also had higher levels of intimacy (Prager, 1989). These results further point to the importance of communication in establishing and maintaining strong intimate relationships. Within the context of this thesis, Erikson's theory underscores the importance of studying links between sexual communication and satisfaction with mental health among a group of participants who are particularly developmentally motivated to succeed in the relational domain of their lives.

Furthermore, research indicates that early adulthood is a time in which mental health concerns first surface for many individuals. Health data collected by Statistics Canada (2020) reports that individuals between the ages 18-34 show the highest levels of mood disorders, such as depression, in comparison to any other age cohort at 11.6% in 2019. If young adults are most highly impacted by the development of depression and particularly motivated to succeed in their intimate relationships, it emphasizes the importance of targeting analysis of the interactions between depression and sex in young adults.

The Current Study

The current study will explore the ways in which symptoms of depression influence sexual functioning. I investigate the longitudinal interrelations among depressive symptoms, sexual communication, and sexual satisfaction and test whether associations are moderated by

the sex of the participant (whether they are male or female). Research related to mental health and sexual functioning has largely focused on medically defined sexual dysfunction, with less attention paid to sub-clinical sexual functioning, including sexual satisfaction and communication. My research builds upon a growing body of research examining how depressive symptoms are associated with sexual communication and satisfaction and adds an important longitudinal dimension to a literature that has primarily examined cross-sectional associations among these constructs. Thus, results from this thesis may have implications for mental health and relationship education by drawing attention to the links between feelings of depression and sexual outcomes. Accordingly, this study aims to address the following research questions: (1) What are the longitudinal associations between depression symptoms, sexual communication, and sexual satisfaction? (2) Do the associations between depression, sexual communication, and sexual satisfaction differ for males and females?

Method

Procedures

Data from three waves of the German Family Panel (pairfam) study will be used to answer the research questions. Pairfam is a multi-disciplinary, longitudinal study with annual survey data collected from a national sample of focal (anchor) participants devoted to understanding individual and family development with a prospective, multi-actor design. Data are gathered in four domains: child development, couple well-being, fertility, and intergenerational relationships (Huinink et al., 2011). At Wave 1 in 2008/2009, 12,402 anchor participants were recruited into the study from three birth cohorts (adolescents aged 15 to 17 years, young adults between 25 and 27 years, and adults nearing midlife aged 35 to 37 years) using a stratified random sampling procedure (Huinink et al., 2011). Partners were recruited for a subset of the anchors in Wave 1 and a sample of anchors' children and parents were recruited in Wave 2. Data collection is completed yearly and is scheduled to run for a total of 14 years, ending in 2022.

This thesis uses data from anchor participants because sexual communication was assessed only among the focal study participants. Anchor surveys are completed annually in-person using Computer-Assisted Personal Interviewing and Computer-Assisted Self-Interviewing for sensitive sections, including those containing questions about depressive symptoms, sexual communication, and sexual satisfaction. Those who complete the survey receive €10 each wave. The current study uses data from Waves 2, 3 and 4 because these were the first waves in which the focal variables of interest were assessed. Additional details about pairfam can be found in the study's concept paper (Huinink et al., 2011), field reports (e.g., Brüderl, Schmiedeberg, at al., 2018), and study website: http://www.pairfam.de/en/study.html.

Participants/Sample

Given the focus of the study, the total sample of anchor participants at Wave 2 (n = 9,069) was filtered in several steps. First, in order to facilitate exploration of the longitudinal links between the focal variables, I selected individuals who were in a relationship with the same partner across Waves 2, 3, and 4 (n = 3,080). Next, I selected only participants from the young adult birth cohort (n = 1,083) because the sexual communication questions were only asked of this particular cohort in Waves 2, 3, and 4. Given my focus on sexual communication and satisfaction, I selected only participants who reported having past sexual experience, providing a final subsample of n = 959 participants used in the analysis.

Slightly more participants in this subsample were female (57.7%) than male, with ages ranging between 25 and 29 years old (*M* = 27.16, *SD* =.89) in accordance with selecting the young adult age cohort for analysis. Just under one third of participants (32.7%) held a university degree or higher. In terms of relationship status at Wave 2, 41.5% were married; 39.5% were in a non-marital cohabiting relationship; and 19.0% were dating. The average relationship duration for couples included in the subsample was 5.62 years (*SD* = 3.36). Regarding parental status, 49.5% did not have children, 18.2% had one child, 4.6% had two children, 3.6% had three children, and 1.0% had four children.

Measures

Descriptive statistics for thesis variables are contained in Table 1.

Sexual satisfaction. Sexual satisfaction in Waves, 2, 3, and 4 was assessed with a single item: "How satisfied are you with your sex life?" Participants provide a score on a Likert scale ranging from 0 = *very dissatisfied* to 10 = *very satisfied.* This item mirrors the relationship

satisfaction item (described with the control variables, below) that was adapted from the Relationship Assessment Scale (Hendrick, Dicke, & Hendrick, 1998).

Sexual communication. Sexual communication was assessed in Waves 2 and 3 using two items adapted from a larger scale by Piles et al. (1999). Participants rated themselves from 1 = *not at all* to 5 = *absolutely* on the following questions: "If I want something specific during sexual contact, I say it or show it," and "Generally speaking, I can express my sexual needs and desires very well." Inter-item correlations were .68 at Wave 2 and .69 at Wave 3.

Depressive symptoms. Self-reported depressive symptoms were measured at Waves 2, 3, and 4 using 10 items from the State-Trait Depression Scale (STDS; Spaderna, Schmukle, & Krohne, 2002). Respondents indicate how often the items describe them in general from 1 = a*lmost never* to 4 = *almost always.* Five reverse-coded items measure positive mood: "I am happy," "I feel good," "I feel secure," "I am calm and composed," and "I enjoy life." and five items measure negative mood: "My mood is melancholy," "I am depressed," "I am sad," "I am in desperation," and "My mood is gloomy." Internal consistency at all waves was $\alpha = .86$.

Control variables. Relationship duration (in years), relationship satisfaction, and sexual frequency assessed in Wave 2 were included as control variables. One item from the Relationship Assessment Scale (Hendrick, Dicke, & Hendrick, 1998) assessed relationship satisfaction: "All in all, how satisfied are you with your relationship?" Responses ranged from 0 = *very dissatisfied* to 10 = *very satisfied*. Sexual Frequency was assessed with one question: "How often have you had sexual intercourse on average during the past three months with your partner?" Responses ranged were 1 = *not in the past three months*, 2 = *once per month or less,* 3 = two-to-three times per month, 4 = *Once per week,* 5 = two-to-three times per week, 6 = *more than three times per week,* and 7= *daily*.

Analytic Plan

I answered my research questions using multiple group cross-lagged panel modeling (Campbell, 1963). This method allowed me to simultaneously evaluate potential reciprocal associations over time between depressive symptoms, sexual communication, and sexual satisfaction and test whether sex moderated these longitudinal associations. A prototype model is depicted in Figure 1. Autoregressive paths in the model account for continuity in variables across time by regressing future assessments of a given construct on prior assessments of itself (e.g., Wave 2 depressive symptoms → Wave 3 depressive symptoms). All constructs are specified to covary within-time to account for cross-sectional associations (e.g., Wave 2 depressive symptoms ↔ Wave 2 sexual communication ↔ Wave 2 sexual satisfaction). Reciprocal longitudinal associations are tested with application of cross-lagged paths from one construct at a given wave regressed on another construct from a prior wave and vice versa (e.g., Wave 2 sexual communication → Wave 3 depressive symptoms and Wave 2 depressive symptoms → Wave 3 sexual communication).

In preparation for the analyses, variables were screened to ensure the data did not violate statistical assumptions of maximum likelihood estimation used to compute the models (e.g., normality, independence of observations; Kline, 2016). I also reviewed the descriptive statistics to check for outliers and to diagnose the amount of missing data. Generally, missing data were low in this sample ranging from 0.1% (depressive symptoms at Wave 2) to 10.8% (sexual communication at Wave 3). All missing data were handled with full-information maximum likelihood estimation (Enders, 2010).

Results

Correlations

Table 1 provides descriptive statistics and bivariate correlations. All focal variables were correlated with themselves across the three time points (e.g., higher depressive symptoms for females at Wave 2 were associated with higher depressive symptoms at Wave 3 r = .73 and Wave 4 r = .64, ps < .05). As expected, higher levels of depression were associated with lower levels of sexual communication at all waves for both males (rs from -.13 to -.24, ps < .05) and females (r = -.10 to -.21, ps < .05), except Wave 2 sexual communication was not associated with Wave 4 depressive symptoms for males (r = -.05, p = .374). This could be, in part, due to the 2-year time lag between the measurement of these variables. Higher levels of depression were also associated with lower levels of sexual satisfaction for both males (rs from -.16 to -.23, ps < .05) and females (rs from -.17 to -.31, ps < .05). Sexual frequency was associated with all variables except Wave 3 (r = -.08, p = .12) and Wave 4 depression for males (r = -.04, p = .38) and Wave 4 depression for females (r = -.08, p =.30). Overall, relationship duration was not associated with the focal variables of interest (depressive symptoms, sexual communication, and sexual satisfaction) at each wave , except being in a longer duration relationship was associated with less sexual satisfaction in Wave 2 for males (r = -.18, p < .05) and with less sexual satisfaction in Wave 4 for females (r = -.11, p < .05). These results indicate that there may be possible differences in the associations between variables for males and females and support analysis of sex as a moderator and support further longitudinal analysis of these variables.

Multiple Group Autoregressive Cross-Lagged Model Results

A multiple group autoregressive cross-lagged model was next computed to assess whether the sex of participant moderated the longitudinal links between depression, sexual

communication and sexual satisfaction. The freely estimated multiple group model with no equality constraints fit the data well: χ^2 (8) = 5.274; RMSEA = .000 (90% CI = .000, .039); CFI = 1.000; TLI = 1.000; SRMR = .007. Equality constraints were placed on each of the ten corresponding cross-lagged pathways for males and females one at a time (e.g., the path from Wave 2 depressive symptoms to Wave 3 sexual communication was set to be equal for males and females) and chi-square difference tests were computed to assess whether the equality constraint significantly worsened model fit (see Table 2). If the fit significantly worsened following the addition of the constraint, then gender moderated the path (e.g., the path differed significantly for males and females). A non-significant worsening in model fit means the path does not differ for males and females and provides evidence that the sex of the participant did not moderate the pathway. The application of equality constraints did not worsen fit for the associations between any of the variables, demonstrating that gender did not moderate longitudinal associations between depressive symptoms, sexual communication, and sexual satisfaction. Given this, I proceeded to compute a single group model as my final analysis and added the control variables.

Autoregressive Cross-Lagged Modeling Results

The standardized results for the final model are depicted in Figure 2, which fit the data well. Beginning with the control variable associations not depicted, the three focal variables at Wave 2 were regressed on the control variables (also assessed at Wave 2): sexual frequency, relationship satisfaction and relationship duration. Sexual frequency was positively associated with both sexual satisfaction (β = .467, p = .000) and sexual communication (β = .301, p = .000), but not significantly associated with depressive symptoms (β = -.060, p = .060). Relationship satisfaction was positively associated with sexual satisfaction (β = .355, p = .000), sexual

communication (β = .077, *p* = .015) and negatively associated with depressive symptoms (β = -.315, *p* = .000). Relationship duration was not associated with any of the key variables of interest: sexual satisfaction (β = .019, *p* = .475), sexual communication (β = -.025, *p* = .430), nor depressive symptoms (β = -.025, *p* = .430).

Turning to the focal results, depressive symptoms, sexual communication, and sexual satisfaction were associated within time at all three waves. Higher reports of depressive symptoms were concurrently associated with lower levels of sexual communication and sexual satisfaction, and sexual communication was associated with higher sexual satisfaction. This pattern was evident in Waves 2 and 3 and depressive symptoms were linked with lower levels of sexual satisfaction at Wave 4 (sexual communication was not measured in this wave).

Regarding the autoregressive paths, prior reports of all variables always positively predicted itself across time. Higher levels of Wave 2 depressive symptoms predicted higher levels of depressive symptoms at Wave 3 and higher levels of Wave 3 depressive symptoms were associated with higher levels of Wave 4 depressive symptoms. Higher levels of sexual communication in Wave 2 were associated with higher levels of sexual communication in Wave 3. Lastly, higher levels of sexual satisfaction in Wave 2 predicted higher levels of sexual satisfaction in Wave 3 and higher levels of sexual satisfaction in Wave 3 were associated with higher levels of sexual satisfaction in Wave 4.

The longitudinal cross-lagged associations among depressive symptoms, sexual communication, and sexual satisfaction also yielded some significant results. Depressive symptoms predicted lower sexual communication and sexual satisfaction in the future: higher levels of depressive symptoms in Wave 2 were associated with lower levels of both sexual communication and sexual satisfaction in Wave 3 and Wave 3 depressive symptoms predicted

lower levels of sexual satisfaction in Wave 4. Neither sexual communication (Wave 2 to 3: β = .003, p = .900; Wave 3 to 4: β = .045, p = .097) nor sexual satisfaction (Wave 2 to 3: β = -.022, p = .394; Wave 3 to 4: β = -.038, p = .167) were associated with future depressive symptoms. Between Waves 2 and 3, sexual communication and sexual satisfaction were reciprocally associated; Wave 2 sexual communicated predicted higher sexual satisfaction at Wave 3 and Wave 2 sexual satisfaction was associated with higher Wave 3 sexual communication. Wave 3 Sexual communication was not associated with Wave 4 sexual satisfaction (β = .004, p = .900).

Discussion

The purpose of this study was to examine longitudinal associations among depressive symptoms, sexual communication, and sexual satisfaction and to determine whether links among constructs differ for males and females. My analyses and findings also replicate past cross-sectional research and are consistent with a small body of cross-sectional studies finding that higher reports of sexual satisfaction are associated with lower reports of depressive symptoms (Nicolosi et al., 2004; Mosack et al., 2011). Depressive symptoms, sexual communication and sexual satisfaction were associated within each wave of data in the expected directions (depressive symptoms were associated with lower sexual satisfaction and communication and higher sexual satisfaction was associated with greater communication), but the longitudinal links revealed novel insights about the directionality of these constructs.

The results showed that depressive symptoms predicted both sexual communication and sexual satisfaction, but sexual communication and satisfaction did not predict feelings of depression. The finding that depressive symptoms negatively predicted sexual outcomes is consistent with a Relational Developmental Systems approach. These results confirm my expectation that that individual level concerns such as depressive symptoms would ripple out and impact relational functioning through impairments in sexual communication and ultimately sexual satisfaction. In addition, the stress generation hypothesis (Hammen, 1991, 2006) provides a partial interpretation for these findings: the experience of depression may lead individuals to act in ways that create stress in their lives, ultimately exacerbating feelings of depression. In this study, depressive symptoms may have impacted their sexuality through, for example, reduced sexual desire (Laurent & Simons, 2009) which then led to less sexual communication and satisfaction, ultimately straining the partnership. This explanation is congruent with findings

from Nicolosi et al. (2004) who found that depression led to clinical problems in male sexual function (namely, Erectile Dysfunction), which then led to decreases in overall sexual satisfaction. The current study provides a non-clinical perspective on some of the more subtle ways that depressive symptoms may impact sexuality.

But strained couple relations would constitute a stressor expected to increase future feelings of depression according to the stress generation hypothesis and a RDS perspective would also contend a bi-directional relationships between these variables. In conjunction with a RDS perspective, it follows that one's individual experience of depression would influence their proximal context through relationship processes in couples, which may then determine couple outcomes that also reflect the system-level functioning of the dyad, such as sexual communication and satisfaction. However, in this study, sexual communication and satisfaction were not predictive of future depressive symptoms. Why might this be?

It is plausible that the stability of depressive symptoms over time may explain these findings. Indeed, the autoregressive paths between depressive symptoms across the three waves of data support this notion (Wave 2 to 3: $\beta = .72$, Wave 3 to 4: $\beta = .38$, $ps < .001$), showing that a substantial proportion of the variation in depression is accounted for by prior reports of depressive symptoms. These results suggest that depressive symptoms may be a persistent experience which then ripples out into their system-level functioning, such as sexual communication and satisfaction. If depressive symptoms tend to be relatively stable over time, there is less possible variation for sexual communication and sexual satisfaction to predict compared to the larger variability in the sexuality constructs predicted by depressive symptoms. This explanation is congruent with a recent meta-analysis showed that the severity of an individual's depressive symptoms (whether mild, moderate, or severe) largely tend to remain

stable across time (Musliner, Munk-Olsen, Eaton, & Zandi, 2016).

An alternate explanation for the lack of a longitudinal association from sexual communication and sexual satisfaction to future depressive symptoms is that issues within an individual's sex life may lead to generalized dissatisfaction in their intimate relationship (Byers, 2005; Fallis et al., 2016), which may then be linked with heightened feelings of depression (Pankiewicz et al. 2012; Davila et al., 1997). The control variable results underscore this possibility, showing baseline relationship satisfaction negatively associated with Wave 2 depressive symptoms ($\beta = -.315$, $p = .000$). Based on the understanding that depressive symptoms tend to remain fairly stable, it would follow that the variation in depressive symptoms might be explained by more general factors in intimate relationships like relationship satisfaction, rather than by specific processes such as sexual communication and sexual satisfaction. These results further emphasize the importance of interventions that teach couples to understand the linked nature of individual mental health and couple sexuality so they may more effectively support one another when experiencing mental health problems. In addition, it may also indicate that targeting individual mental health is an important way to prevent negative sexual outcomes, however, targeting sexual outcomes may not have a direct effect on individual level depressive symptoms.

The analyses also revealed that sexual communication and sexual satisfaction were reciprocally associated; Wave 2 sexual communicated predicted higher sexual satisfaction at Wave 3 and Wave 2 sexual satisfaction predicted higher Wave 3 sexual communication. These results are congruent with past research which stresses the importance of communication in fostering satisfying sexual relationships (Schoenfeld et al., 2017), but adds an important insight: a satisfying sex life also prompts increased sexual communication in the future. This is further

evidence that well-functioning relationships tend to be well-functioning in multiple ways that are mutually reinforcing across time (Johnson, Lavner, Barton, Stanley, & Rhoades, 2020). Conversely, a positive relationship between sexual satisfaction and sexual communication also indicates that as one factor lowers, the other is also likely to lower: the less satisfied individuals are in their sexual relationships, the less likely they will be to discuss sex with their partners. Much of the research regarding sexual communication, which takes place within the context of clinical sexual dysfunction, supports the idea that when there are issues in a sexual relationship, couples are less inclined to engage in communication about sex (Pazmany et al., 2015; Rancourt et al., 2016; Smith & Pukall, 2014). Communication can be seen as the vehicle through which couples experience intimacy (feeling understood, cared for, and validated; Reis & Shaver, 1987), therefore, communicating about something as personal as one's sexual desires may hold unique potential to strengthen couple bonds, particularly when one's sex life is not going as well as hoped. Interventions aimed at helping couples communicate about their sex life when they need it most (e.g., when their sexual satisfaction is low) may prove effective at increasing sexual satisfaction and fostering intimacy.

My second research question was to determine whether sex moderated the links between depression, sexual communication, and sexual satisfaction. Results showed sex did not moderate any associations in the model. This finding was not altogether unanticipated, as a gender relations perspective would imply that sexuality is impactful for both males and females, but in different ways. For example, an unsatisfying sexual relationship may be particularly detrimental for males because they tend to have a greater motivation for sex than females, on average (Baumeister, Catanese, & Vohs, 2001). On the other hand, gendered expectations place women in a role where managing and maintaining relationship quality is key (Dindia & Baxter, 1987).

Problems in the relational domain, such as low sexual satisfaction, was thought to lead to increased depressive symptoms through a perceived failure to fulfil the societally endorsed notions of the female role. Each of these explanations, however, focus on the sexuality to depressive symptoms pathway that proved not to be significant in my analysis. The results clearly demonstrate that depressive symptoms are equally detrimental to future sexual communication and satisfaction for males and females.

One explanation lies in the gender similarities hypothesis which asserts that males and females are more similar than different on many, but not all, psychological variables (e.g., social and personality variables such as neuroticism and agreeableness), and has been supported by a growing body of literature on the analysis of gender difference (Hyde, 2005). Much prior research looking at mental health and sexual outcomes did not report significant gender differences. Of the limited studies in this area that did find differences, the magnitude of the differences was small. For example, the meta-analysis from Hyde and Petersen (2011) found that males reported higher levels of sexual satisfaction, but the effect size was small (d = .17). The results of the current thesis may be considered in light of this theory as supporting evidence that perhaps depression has a similar association with sexual communication and satisfaction for males and females.

It is also plausible that the measurement utilized in this thesis was not optimal to capture gender differences that may still exist. It is likely that an individual's personal identity (biological sex *or* gender) matters less than their own personal gendered attitudes and beliefs (Lefkowitz et al., 2014). While one's experience as being socially labelled 'male' or 'female', 'man' or 'woman' has long been the key variable utilized in analysis of gender differences, increasing literature supports the notion of utilizing measurement that captures individuals

personal beliefs about gender norms as they may "similarly influence sexual behaviours in the way they may structure men's and women's behaviours with each other" (Lefkowitz et al., 2014, p. 835). In their study of 433 university students, Lefkowitz et al. (2014) pursued a more nuanced examination of how gender beliefs impact sexual behaviours and beliefs. They found that participants' gender role attitudes, rather than their biological sex, were associated with their sexual behaviours. The results from the current thesis support a more nuanced investigation of gender relations theory in the future, as individuals hold diverse gender role attitudes that may influence their experience of mental health and sexuality, independent of their biological sex.

In this thesis, gender relations theory urges consideration of the ways in which societally endorsed gender norms may differently impact males and females experience of mental health and sexual outcomes. Based on my results, interventions to improve mental health may also positively influence sexual functioning for men and women. Future research should target specific gendered sex expectations as an area of investigation in order to understand the specific ways in which males and females may navigate their experience of managing depressive symptoms or sexual issues within intimate sexual relationships.

Limitations

Findings must be considered in light of the study limitations. First, the data utilized in this study were from only one member of a couple. Although research has shown that samples comprised of one member of a couple tend to capture greater variability in relationship quality compared to samples including both partners (Barton, Lavner, Stanley, Johnson, & Rhoades, 2020), further dyadic research which integrates perspectives of both members of an intimate partnership would provide additional insight regarding the relational impact of depressive symptoms on couple sexuality. Second, sexual satisfaction was measured by a single item and

sexual communication with an abbreviated measure. Robust measurement of these constructs is needed for future research to reveal a more precise understanding (Diamantopoulos, Sarstedt, Fuchs, Wilczynski, & Kaiser, 2012). Third, these results are based on analysis of data provided by a sample of German couples and these results may not generalize to North American populations. There is currently no comparable dataset within Canada, however the World Health Organization (2017) estimates similar prevalence of depressive and anxiety disorders among Germans (5.2%) and Canadians (4.7%). Last, due to the nature of the variables under analysis, participants were filtered to include only those who reported having had sexual intercourse in the past. Sexual interactions may involve a variety of behaviours aside from intercourse, however, and sexual communication likely plays an important role for those who have never had intercourse but are engaging in other sexual activities. Although the dataset utilized for the present study did not provide any variables to allow for this to be explored, it may be pertinent in future research to consider the broad range of sexual behaviours that can encompass an individual's sex life.

Conclusions

Drawing on a relational developmental systems approach, the stress generation hypothesis, and gender relations theory, the present study asked two questions: 1) What are the longitudinal associations between depression symptoms, sexual communication, and sexual satisfaction? and (2) Are there gender differences in the associations between depression, sexual communication, and sexual satisfaction? The findings indicate that depressive symptoms predict sexual communication and sexual satisfaction in the future, but the reverse was not evident: sexual communication nor sexual satisfaction predicted future depressive symptoms. Furthermore, the pattern of results did not differ for men and women. These results provide a

new layer of understanding to past cross-sectional research which has highlighted the links between depression and sexual satisfaction and indicate the stable influence of depression, on both itself as well as sexual outcomes, over time.

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Appendix

Table 1

Descriptive Statistics and Correlations for Men (n = 406) Below and Women (n = 553) Above the Diagonal

Variable	1	2	3	4	5	6	7	8	9	10	11	*M*	*SD*
1. Depression (W2)	–	.73*	.64*	-.21*	-.18*	-.27*	-.26*	-.22*	-.34*	-.08	-.10*	1.67	.52
2. Depression (W3)	.70*	–	.66*	-.16*	-.21*	-.21*	-.28*	-.24*	-.28*	-.05	-.08	1.69	.53
3. Depression (W4)	.59*	.59*	–	-.13*	-.10*	-.17*	-.21*	-.31*	-.20*	-.08	-.03	1.71	.53
4. Sex Com (W2)	-.19*	-.14*	-.05	–	.60*	.43*	.29*	.21*	.15*	.00	.31*	3.90	.88
5. Sex Com (W3)	-.23*	-.24*	-.13*	.56*	–	.30*	.39*	.19*	.10*	-.03	.19*	3.73	.95
6. Sex Sat (W2)	-.23*	-.18*	-.16*	.31*	.29*	–	.48*	.34*	.46*	-.03	.53*	7.13	2.38
7. Sex Sat (W3)	-.20*	-.20*	-.16*	.24*	.40*	.51*	–	.49*	.22*	-.03	.33*	6.88	2.40
8. Sex Sat (W4)	-.16*	-.18*	-.17*	.18*	.27*	.36*	.48*	–	.25*	-.11*	.22*	6.26	2.20
9. Rel Sat (W2)	-.29*	-.18*	-.17*	.09	.11*	.39*	.28*	.29*	–	-.07	.18*	8.21	2.18
10. Rel Dur (W2)	-.08	.04	.07	-.09	-.05	-.18*	-.08	-.01	-.02	–	-.14*	6.22	3.38
11.Sex Freq (W2)	-.12*	-.08	-.04	.31*	.24*	.51*	.30*	.20*	.13*	-.29*	–	3.95	1.30
Mean	1.59	1.56	1.64	3.82	3.72	7.35	6.85	6.18	8.26	5.00	4.21		
Standard Deviation	.41	.41	.44	.84	.87	2.25	2.37	2.59	2.21	3.27	1.28		
Range	1 – 4	1 – 4	1 – 4	1 – 5	1 – 5	0-10	0 – 10	0 – 10	0 – 10	0 – 20	0 – 7		

Note: Sex = Sexual. Com = Communication. Sat = Satisfaction. Rel = Relationship. Dur = Duration. Freq = Frequency. W2 = Wave 2. W3 = Wave 3. W4 = Wave 4.

*$p < .05$ (two-tailed).

Table 2
Multiple Group Model Comparisons Testing Gender Moderation (n= 959)

Pathways	χ^2 (df)	RMSEA [90% CI]	CFI	TLI	SRMR	Model Comparison
Baseline: Freely Estimated Model	5.274 (8)	.000	1.01	1.00	.007	
Constraint 1: W3 Depression → W2 Sex Com	5.320 (9)	.000 [.000, .033]	1.00	1.00	.007	$\chi^2_{diff}(1) = .046$, $p = .830$
Constraint 2: W3 Depression → W2 Sex Sat	5.321 (10)	.000 [.000, .026]	1.00	1.00	.007	$\chi^2_{diff}(1) = .001$, $p = .975$
Constraint 3: W3 Sex Com→ W2 Sex Sat	7.105 (11)	.000 [.000, .032]	1.00	1.00	.010	$\chi^2_{diff}(1) = 1.784$, $p = .182$
Constraint 4: W3 Sex Com → W2 Depression	8.608 (12)	.000 [.000, .034]	1.00	1.00	.013	$\chi^2_{diff}(1) = .503$, $p = .478$
Constraint 5: W3 Sex Sat → W2 Depression	9.168 (13)	.000 [.000, .032]	1.00	1.00	.013	$\chi^2_{diff}(1) = .560$, $p = .454$
Constraint 6: W3 Sex Sat → W2 Sex Com	9.168 (14)	.000 [.000, .027]	1.00	1.00	.013	$\chi^2_{diff}(1) = .000$, $p = 1.000$
Constraint 7: W4 Depression → W3 Sex Com	9.192 (15)	.000 [.000, .023]	1.00	1.00	.013	$\chi^2_{diff}(1) = .024$, $p = .877$
Constraint 8: W4 Depression → W3 Sex Sat	9.263 (16)	.000 [.000, .018]	1.00	1.00	.013	$\chi^2_{diff}(1) = .071$, $p = .790$
Constraint 9: W4 Sexual Sat → W3 Sex Com	10.684 (17)	.000 [.000, .021]	1.00	1.00	.015	$\chi^2_{diff}(1) = 1.42$, $p = .233$
Constraint 10: W4 Sex Sat → W3 Depression	10.792 (18)	.000 [.000, .017]	1.00	1.00	.015	$\chi^2_{diff}(1) = .108$, $p = .742$

Figure 1

Prototype Bivariate Latent Change Score Model Depicting Longitudinal Associations Between Depressive Symptoms, Sexual Communication, and Sexual Satisfaction

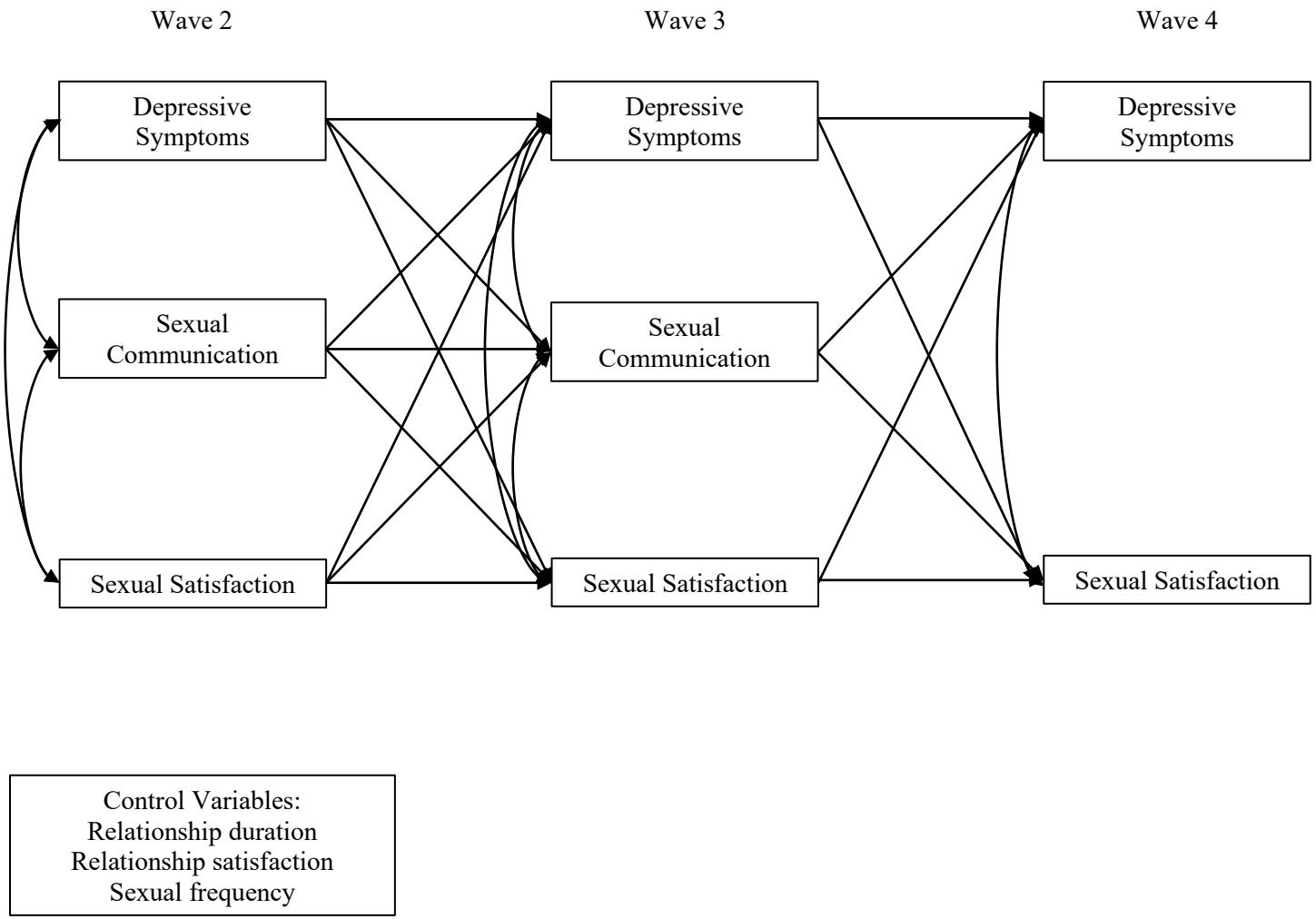
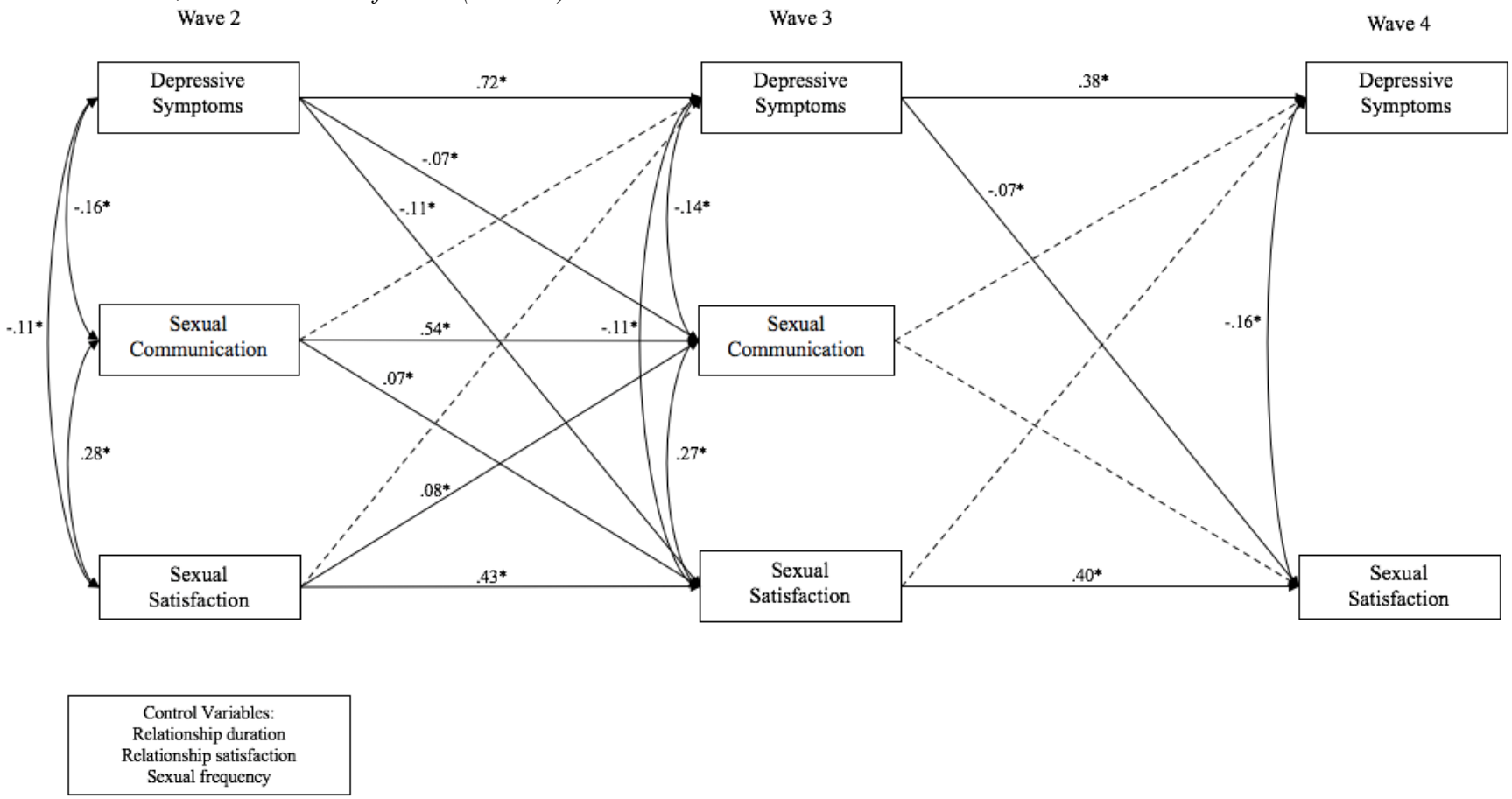


Figure 2

Autoregressive Cross-Lagged Model Results Depicting Longitudinal Associations Between Depressive Symptoms, Sexual Communication, and Sexual Satisfaction (n = 959)



Note: All variables in the model were regressed on relationship satisfaction, sexual frequency and relationship duration. Model fit indices: χ^2 (19) = 44.477; RMSEA = 0.038 (90% CI = 0.023 - 0.052); CFI = .991; TLI = 0.977; SRMR = .020 *$p < .05$.