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Baby on the Way, Sex Gone Away? A Dyadic Investigation of Sexual Satisfaction in Pregnancy

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Sexual Satisfaction in Pregnancy

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Abstract

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Research indicates that having high sexual satisfaction during pregnancy is difficult for couples. This negative trend is important considering that low sexual satisfaction can negatively affect relationship satisfaction, psychological health, and child outcomes. However, there is evidence this trend does not apply to all and different groups of couples exist in terms of their sexual satisfaction in pregnancy. The current study explored if different subsets of couples, composed of pregnant wives and husbands, exist in terms of their sexual satisfaction during pregnancy and what factors distinguish potential subsets. Using U.S. nationally representative data from 523 pregnant married couples and latent profile analysis adjusting for pregnancy-related biological factors, two subsets of pregnant couples were identified—a larger subset of couples where wives and husbands were satisfied with sex overall (79%) and a smaller subset where wives and husbands were neutral about satisfaction with sex (21%). Having lower depressive symptoms among wives was associated with a greater likelihood of being in the more satisfied subset over the less satisfied subset—the only significant group membership predictor among a variety of biological, psychological, and relational factors, including sexual frequency. Implications include the notion that most U.S. couples do well navigating the sexual challenges in their control during pregnancy and the importance for medical professionals, practitioners, and educators to help women maintain good mental health during pregnancy to better sexual, relational, and psychological outcomes for expectant couples and improve child outcomes.

Keywords*: pregnancy, sexual satisfaction, depression, parents, couples

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Sexual Satisfaction in Pregnancy

Most research on sexual relationships during pregnancy indicates that having high sexual satisfaction during pregnancy is difficult for pregnant women and their partners (see Jawed-Wessel & Sevick, 2017; von Sydow, 1999). This is not surprising given the challenges pregnant women face such as nausea and weakness (Yanikkerem et al., 2016), physical discomfort (Yangin & Eroglu, 2011) and fears of harming the fetus through sexual activity such as intercourse (Babazadeh et al., 2013; Rados et al., 2014; Yanikkerem et al., 2016), even though sexual activity is generally safe (Brown & McDaniel, 2008). While this negative trend is not surprising, it is important considering that low sexual satisfaction can negatively affect both relationship satisfaction and psychological health (Impett et al., 2014). Moreover, because child wellness outcomes are related to parents' relationship quality with their partners (Hewison, 2013; Surkan & Poteat, 2011) and maternal psychological health (Surkan & Poteat, 2011), the implications of low sexual satisfaction extend beyond the couple to their children.

Despite these challenges, there is evidence that different groups of couples may exist in terms of their sexual satisfaction in pregnancy (SSIP) as some couples experience high sexual satisfaction in pregnancy while other's sexual satisfaction is lower (Nakić Radoš et al., 2015; Pauleta et al., 2010; Yildiz, 2015). Thus, it is plausible that at least two subsets of couples exist in terms of their SSIP exist—one with higher sexual satisfaction and one with lower sexual satisfaction. Despite this evidence, to the author's knowledge no major studies have explicitly sought to investigate why different groups of couples may exist in terms of their SSIP. Further, current literature is limited in that it focuses primarily on the experiences of women (see Jawed-Wessel & Sevick, 2017; von Sydow, 1999). While women are drastically impacted by pregnancy

(see Jawed-Wessel & Sevick, 2017; von Sydow, 1999), only looking at the experiences of women is limiting in that neglects the fact that pregnancy can negatively affect men's sexual satisfaction (Nakić Radoš et al., 2015) and can negatively affect both men and women altogether (Khalesi et al., 2018)—the shared couple experience.

Accordingly, the question *do different subsets of couples exist in terms of their sexual satisfaction during pregnancy* is explored in the current manuscript. Additionally, to understand what factors might distinguish these subsets of couples—including correlates of SSIP such as biological factors like physical health symptoms (Yanikkerem et al., 2016), psychological factors like mental health (DeJudicibus & McCabe, 2002; Seven et al., 2015), and social factors like relational satisfaction (DeJudicibus & McCabe, 2002; see also Kim & Yeo, 2017)— the question *what factors distinguish different subsets of couples in terms of their sexual satisfaction during pregnancy* is also explored. Family systems theory (Smith & Hamon, 2012) with a sensitivity towards the biopsychosocial model (Engel, 1977) is used to guide the investigation.

First, the benefits of using data from both partners to investigate this topic through the lens of family systems theory and the biopsychosocial model are discussed. Second, evidence pointing to different levels of SSIP across groups of couples is reviewed. Third, SSIP literature in terms of the biopsychosocial model is reviewed. Finally, the study conducted to explore this topic is described.

Review of Literature

Family Systems Theory, the Biopsychosocial Model, and Sexual Satisfaction in Pregnancy

Most research on sexual satisfaction in pregnancy has focused exclusively on the experiences of women thus limiting understanding about men and the couple as a whole. This approach by researchers is narrow as it disregards that the notion that the experiences of

individuals are best understood as they relate those of other family members (e.g., their partner) and the family as a whole—a key tenet of family systems theory (Smith & Hamon, 2012). This narrow approach is inaccurate as, for most, sexual satisfaction during pregnancy occurs in the context of a couple relationship instead of a phenomena experienced by women alone. Subsequently, studying SSIP through family systems theory—by first, studying pregnant women and their partners together and second, viewing both partners as part of a larger whole—will likely lead to a more realistic understanding of SSIP. For instance, the finding by Kim and Yeo (2017) that husband sexual attitudes affects pregnant women's sexual satisfaction illustrates how partners can affect one another's SSIP and that examining partners together as a couple can provide valuable insights over studying partners alone.

In addition family systems theory, examining SSIP through the biopsychosocial model (Engel, 1977) is valuable. Engel (1977) suggested that the "dominant model of disease today is biomedical, and it leaves no room for the social, psychological and behavior dimensions of illness" (p. 135) and alternatively promoted understanding the biological, psychological, and social factors that surround illness in order to better treat it. Although not an illness, pregnancy related changes—including changes in sexual satisfaction and functioning—are affected by biological (Yanikkerem et al., 2016), psychological (DeJudicibus & McCabe, 2002; Seven et al., 2015), and social factors (DeJudicibus & McCabe, 2002; see also Kim & Yeo, 2017). Thus, exploring SSIP in terms of all three of these factors is more encompassing than studying any pregnancy in terms of one or two of these factors alone.

As Family systems theory and the biopsychosocial model are complementary frameworks, combining their perspectives to study SSIP is worthwhile. Specifically, any one biological, psychological, or social characteristic of one partner—or any combination thereof—

could affect another partner's biological, psychological, or social outcome. For instance, a biological factor such as pregnancy related fatigue for pregnant women (Santiago et al., 2013) could affect a psychological outcome in their partners such as sexual satisfaction. Accordingly, SSIP is investigated in the current study through the lens of family systems with sensitivity towards biopsychosocial model by looking at the experiences of both pregnant women and their partners and how both partners biological, psychological and social characteristics affect one another and the couple overall (see Figure 1).

Evidence of Differing Levels of SSIP

Having established the theoretical lens of the current study, the question *what does sexual satisfaction in pregnancy look like for couples* is considered. Literature overwhelming indicates that decline in sexual function and sexual satisfaction is the norm for couples. Review pieces demonstrate this conclusion has been studied and recognized throughout literature in both the 20th century (von Sydow, 1999) and 21st century (Jawed-Wessel & Sevick, 2017). Declines in SSIP make sense considering the variety of changes to a woman's body and the often comorbid health challenges such as nausea or fatigue that accompany those changes (Santiago et al., 2013).

As described below, literature contains evidence that, despite decline, some couples do better than others in terms of SSIP and maintain relatively high levels of sexual satisfaction. For example, Pauleta et al. (2010) observed in a sample of 188 women retrospectively reporting on their pregnancy that 27.7% of women report *lower* sexual satisfaction over the course of pregnancy, 48.4% of women report *unchanged* sexual satisfaction over the course of pregnancy and 14.9% reported an *increase* in sexual satisfaction over the course of pregnancy (Pauleta et al., 2010). This study, as well as additional work with both women (Yildiz, 2015) and men (Nakić Radoš et al., 2015), alludes to the possibility that different groups of individuals exist in

terms of SSIP. A key takeaway is that, while overall decline may be the norm, high SSIP for a subset of couples is possible.

One drawback of previous literature is the lack of work investigating and describing the characteristics of pregnant women and their partners who maintain high SSIP. Couples, medical providers, clinicians and educators would benefit by understanding the profiles of couples who do better than others in terms of SSIP. Specifically, once the positive traits of high SSIP couples are identified, couples and practitioners could promote those characteristics in order better sexual relationships during pregnancy. Additionally, as fulfillment in sexual relationships occurs, positive outcomes in terms of psychological and physical health and relationship satisfaction (see Impett et al., 2014, p. 270) and child wellness (Hewison, 2013; Surkan & Poteat, 2011) would likely occur as well.

Potential Factors Differentiating Sexual Satisfaction in Pregnant Couples

The subsequent question to consider is *what factors might describe those couples with higher and lower SSIP*? Literature points to a variety of traits that may differentiate SSIP in couples are organized around the biopsychosocial model in the current manuscript. The biopsychosocial model has been applied to a variety of relational settings, including romantic relationships (Busby et al., 2020; Leavitt et al., 2020) and is similarly a valuable framework for understanding the traits of couples that relate to SSIP and to understanding pregnancy generally. For example, the physical demands of pregnancy (*bio*), the psychological strain of preparing for a child (*psycho*), and the relational strain caused by adjusting lifestyles to accommodate a baby (*social*) all likely affect SSIP.

Biological Factors

A variety of biological factors may explain differences among couples' SSIP. These include challenging health symptoms such as physical discomfort (Yangin & Eroglu, 2011) and nausea, weakness and fatigue. Specifically, couples may struggle to have pleasurable and fulfilling sex when the pregnant partner feels sick or weak. Although not explicitly studied in pregnancy, poor sleep quality has been connected with poorer sexual satisfaction for women (Costa et al., 2017). Moreover, as sleep quality typically declines for pregnant women during pregnancy (Sedov et al., 2018), poor sleep quality may affect pregnant women's SSIP as well as that of their partners.

Importantly, these health challenges vary as a function of time. For instance, it is common for pregnant women to experience nausea (morning sickness) more heavily in first trimester than other trimesters. Also for example, scholars have found that physical discomfort is a salient challenge in the third trimester of pregnancy (Yangin & Eroglu, 2011). Thus, it is important to consider gestational age—in addition to poor health symptoms—when investigating SSIP.

Psychological Factors

Psychological factors also may differentiate couples and their SSIP. Some important psychological factors to consider are mental health challenges (DeJudicibus & McCabe, 2002; Seven et al., 2015), such as depression (DeJudicibus & McCabe, 2002), that are often rooted in hormonal changes pregnant women experience (See Brummelte & Galea, 2010). For instance, DeJudicibus and McCabe (2002) found links between women's own depression and women's poorer sexual satisfaction during pregnancy.

Although direct links between depression and SSIP in have not yet studied in couple contexts to the author's knowledge, links between one partner's depression and another partners SSIP are plausible based on existing literature, albeit with mixed evidence. For instance, among non-pregnant couples, Miller et al. (2013) found links between wives' marital satisfaction and husbands' depressive symptoms. In contrast however, Holmes et al. (2013) found in their transition to parenthood study that changes in father's depressive symptoms did not predict mother's marital love or marital conflict and that mother's depressive symptoms did not predict father's marital love or marital conflict. Although Holmes et al. (2013) did not find significant associations between change in one partners depressive symptoms and another partners marital outcomes, they did raise the point that "When one partner experiences depressive symptoms, the other is at greater risk to also experience depressive symptoms due to disruption of routines or other stressful events that may exacerbate depressive mood" (p. 826). Holmes et al. (2013) point, as well as limited empirical evidence, suggests that examining associations between psychological factors—like depression—and sexual satisfaction among pregnant couples may be valuable.

Social Factors

Lastly, social factors also may play a role in discriminating between groups of couples with higher sexual satisfaction during pregnancy. For example, relational satisfaction has been linked directly with SSIP for pregnant women (DeJudicibus & McCabe, 2002; see also Kim & Yeo, 2017). A variety of other factors have that have been linked with sexual satisfaction generally—but not explicitly studied in samples with pregnant participants—may also provide insight into SSIP. Specifically, scholars have found links between sexual satisfaction and attachment quality (Impett et al., 2014), relational power (Lau et al., 2006), and communication

quality (Mark & Jozkowski, 2013) among non-pregnant couples. Although not directly studied in pregnancy, there is no reason to believe that these relational processes would not play a role in couple sexual relationships during pregnancy. Subsequently, examining the role that these social factors—relational satisfaction, attachment quality, relational power, and conflict resolution ability (a construct similar to communication quality)—play in SSIP may be valuable.

The Limited Utility of Differentiating SSIP Groups Through Biological Factors

One aim of current study is to identify the healthy characteristics of groups of couples with higher SSIP so that those characteristics can be promoted. While pregnancy-related biological factors (e.g., morning sickness) are, to a certain degree, fixed, non-pregnancy related biological factors (e.g., long-term health), psychological factors and social factors are more malleable. For example, pregnancy-related challenging health symptoms (a pregnancy related biological factor) would be impractical targets for adjusting SSIP. Accordingly, the current investigation will identify groups of couples in terms of their SSIP based on psychological and social characteristics *adjusting (or controlling) for biological factors*.

Present Study

In light of previous literature, the following two hypotheses are investigated:

1. Different groups (classes) of pregnant couples exist in terms of wives' and husbands' sexual satisfaction, after adjusting for pregnancy-related biological factors.

2. Non-pregnancy-related biological factors, psychological factors, and social factors will predict membership in the groups identified in hypothesis one.

In the analyses, pregnancy-related biological factors are represented through *wife poor sleep quality, wife physical symptoms, and the number of weeks pregnant*, non-pregnancy-related biosocial factors through *husband health and husband and wife chronic illness,* psychological

factors through *depression* and social factors through *relational satisfaction, marital power, partner attachment behaviors, and conflict resolution ability.*

Methods

Sample and Procedure

Participants were part of the CREATE study (Yorgason et al., 2019), a nationally representative survey of newly married couples approved by the institutional review board. Before the survey, online consent was endorsed by participants. Wave 1 data collection took place from October 2015–September 2017. Participants were recruited using a two-stage cluster stratification sample design. The first stage involved a stratified selection of 239 counties and the second stage a sample of 11,889 recent marriages within those counties. Among those contacted, dyads (86%) or individuals (14%) from 2,187 marriages were recruited into the study. Of the initial sample of 11,889 marriages, there were 1,220 marriages that did not meet inclusion criteria, indicating that the response rate should be calculated with a denominator of 10,669 couples, making the adjusted response rate about 20% (2,187/10,669)—a successful response rate for dyadic studies (Dillman et al., 2014; Yorgason et al., 2019). Couples needed to be selected through the study procedures (randomly selected counties and then marriage certificates obtained from those counties), had to be currently married, live in the United States, have one spouse between the age of 18 and 36, and the marriage had to be a first marriage for at least one of the spouses. Of the 2,187 participants, 2,106 were in heterosexual marriages. A modified Dillman approach (Dillman et al., 2014) that involved physical mailings via U.S. postal services was used to recruit the sample. A sampling weight was used in the study to enable inferences to the population of married couples in the United States—for further details about sampling and weighting of data, see the CREATE codebook (Yorgason et al., 2019).

At time 1, men were on average 29.82 years old (SD = 5.64) and women 28.04 (SD = 5.38). The majority of the sample were in their first marriage (81%); however, some were in their second marriage or higher (19%). 52% of couples brought children with them into the marriage and, at Time 1, 20% were trying to get pregnant.

For the current study, the wider sample was constrained to only couples who were pregnant at time one, time two, or time three—527 couples. Of the 527 couples, 223 were pregnant at time one, 167 were pregnant at time two but not time one, and 137 were pregnant at time three but neither time one nor time two. These three years of data were included as separate observations to increase the number of couples that could be included in the analyses. Analyses did not utilize the same couple more than once where repeat pregnancies existed (n = 58 repeat couples). Data came from the first reported pregnancy where repeat pregnancies did exist. Due to missing data, the final analytical sample included 523 couples.

Measures

Sexual Satisfaction

Sexual satisfaction was assessed using five items from the RELATE assessment (Busby et al., 2001). Example questions include "How satisfied are you with the amount of love and affection there is in your sexual relationship with your partner?" and "How satisfied are you with how often you currently have sex with your partner?" Participant responses were on five-point scale from 1 (very dissatisfied) to 5 (very satisfied). The mean of the items were taken so that higher scores indicated greater sexual satisfaction (Cronbach's Alpha: Wives = .84; Husbands = .84).

Physical Health Symptoms

Physical health symptoms were assessed using a shortened version of Larsen and Kasimatis' (1991) physical symptom checklist with two additional items added to represent

cold/flu symptoms and joint pain (13 items total). Example health symptoms participants indicated they had over the last week include "nausea/upset stomach," "muscle soreness," and "joint pain." Participants indicated either a 0 (No) or 1 (Yes) to indicate, respectively, the absence or presence of illness. The number of symptoms were summed so that higher scores indicated more physical health symptoms.

Poor Sleep Quality

Poor sleep quality was assessed using 19 items of the Pittsburgh Sleep Quality Index (PSQI) (Buysse et al., 1989). Considering their sleep in the last month, participants indicated sleeping difficulties by responding to statements such as "cannot get to sleep within 30 minutes," and "have pain." Response categories available to participants varied across components; please see Buysse et al. (1989) for full description. The sum of the seven component was taken so that higher scores indicated poorer sleep quality. Cronbach's alphas are not reported due to the nature of this construct.

Weeks Pregnant

The number of weeks pregnant was assessed through a one-item question where participants responded to the prompt "How many weeks along are you in your pregnancy?"

Depressive Symptoms

Depressive symptoms were assessed using the 10-item short version of the Center for Epidemiologic Studies Depression (CESD) scale (Andresen et al., 1994). Example events participants rated the frequency of over the past week included "I felt depressed," and "I was bothered by things that usually don't bother me." Participant responses were on a four-point scale from 1 (Rarely or none of the time (less than one day)) to 4 (Most or all of the time (5-7 days)).

The mean of the items was taken so that higher scores indicated greater depressive symptoms (Cronbach's Alpha: Wives = .75; Husbands = .76).

Relational Satisfaction

Relational satisfaction was assessed with four items from Funk and Rogge (2007). Example questions include "In general, how satisfied are you with your relationship?" and "How rewarding is your relationship with your partner?" Participant responses were on a six-point scale from 0 (not at all/not at all true) to 5 (completely/ completely true) with one exception where a fourth item—"Please select the answer that describes the degree of happiness, all things considered"— was on a seven-point scale from 0 (extremely unhappy) to 6 (perfect). The mean of the items was taken so that higher scores indicated better relational satisfaction (Cronbach's Alpha: Wives = .94; Husbands = .91).

Marital Power

Marital power was assessed with six items adapted from a variety of sources (Ball et al., 1995; Crosbie-Burnett & Giles-Sims, 1991; Lindahl et al., 2004; Sagrestano et al., 1999) an example statement includes "I feel free to express my opinion about issues in our relationship." Participant responses were on a six-point scale from 1 = strongly disagree to 5 = strongly agree). The mean of the items was taken so that higher scores indicated greater power in the marriage (Cronbach's Alpha: Wives = .85; Husbands = .84). For the full list of items, see appendix.

Partner Attachment Behaviors

Partner attachment behaviors were assessed with 6 items from the brief accessibility, responsiveness, and engagement (BARE) scale (Sandberg et al., 2012). Participants responded to two statements from three subscales—accessibility, responsiveness, and engagement. Example statements include "My partner is rarely available to me" (accessibility), "I am confident my

partner reaches out to me" (responsiveness), and "My partner struggles to feel close and engaged in our relationship" (engagement). Participant responses were on a six-point scale from 1 = never true to 5 = always true. The mean of the items was taken so that higher scores indicated greater attachment quality (Cronbach's Alpha: Wives = .86; Husbands = .82).

Conflict Resolution

Conflict resolution was assessed with nine items adapted from (Kerig, 1996). Considering one's disagreements in the last year, participant example statements include "We don't resolve the issue; we continue to hold grudges," and "We don't speak to one another for a while." Participant responses were on a four-point scale from 0 = never to 3 = usually. The mean of the items was taken and items were reverse coded where necessary so that higher scores indicated greater conflict resolution ability (Cronbach's Alpha: Wives = .86; Husbands = .86).

Additional Predictors

Additional predictor variables included if a couple already has children (1 = has children, 0 = no children), sexual frequency, and if participants have had a chronic illness (1 = had, 0 = never had). Sexual frequency was assessed by asking "How often do you currently have sex with your partner?" on a scale ranging from 1 = never to 7= more than once a day.

Controls. A variety of controls were utilized including the following: household income, 1 ($0-9,999) to 16 (Above $150,000), highest level of education, 1 (less than high school) to 7 (advanced degree (JD, Ph.D., PsyD, etc.)), Race, 1 (Caucasian (White)) or 0 (not Caucasian (White)), marital length, and participant age. Race was assessed by participants indicating the racial groups they considered themselves to belong to including "African (Black)", "Asian", "Caucasian (White)", "Native American", "Latino (Mexican American, Puerto Rican, Cuban, etc.)", or "Other."

Analysis

Preliminary analyses were conducted in Stata (Version 16; StataCorp., 2019) and are presented in Table 1 and Table 2. Then, in Mplus (Version 8; Muthén & Muthen, 1998-2017), a latent profile analysis was performed to determine how many adjusted pregnant couple sexual satisfaction classes exist. Couples were classified based on 10 sexual satisfaction items (five from wives, five from husbands). Three variables—wife physical symptoms, wife poor sleep quality, and the number of weeks pregnant—were regressed on the 10 sexual satisfaction items to adjust classification for pregnancy-related biological factors. This allowed classification of couples to occur with the variance in the 10 sexual satisfaction items that relates to pregnancy-related biological factors already accounted for. This is analogous to seeing how a predictor relates to an outcome in multiple regression when you adjust for a covariate. Figure 2 illustrates this classification model.

Class Enumeration

The appropriate number of classes (e.g., 1-class, 2-classes, 3-classes, etc.) was determined based on several criteria. These included values of BIC, (Dyer et al., 2012; Muthén & Muthén, 2016) and entropy (Dyer et al., 2012), only accepting class solutions where all classes are more than 5% of the total sample (Nasserinejad et al., 2017), and the theoretical meaning of class solutions (see Foti et al., 2012). Typically, the Lo–Mendell–Rubin likelihood ratio (LMRLR) would be included as criterion (see Dyer et al., 2012). However, this test is not reliable when using sampling weights as was used here (see Muthén & Muthén, 2016) and is also not available when using imputed datasets in Mplus as the current investigation did (see "Missing Data" section below) and was therefore not considered.

Based on these criteria, a two-class solution best fit the data. Of note, BIC values were best in the two-class solution (class 1 BIC: 22398.64; class 2 BIC: 22351.43; class 3 BIC: 22362.39) and entropy was slightly higher in the two-class solution (.87) than in the three-class solution (.85). Because BIC and entropy values were worse in the three-class solution as compared to the two-class solution, class solutions beyond three (i.e., 4-class, 5-class, and so forth) were not considered.

To highlight differences between adjusting class solutions for pregnancy-related biological factors and not doing so, a latent profile analysis was performed with the same 10 items as before but did not include regressions paths from pregnancy-related biological factors. To make these analyses more comparable, the three-pregnancy related biological factors were previously centered at their means in the adjusted latent profile analysis. For reference, Figure 3 is provided and plots mean values of wives' and husbands' sexual satisfaction items across the one, two, and three class solutions in both the adjusted and unadjusted latent profile analyses.

Predicting Class Membership

In the next step of the analysis, the automated three-step approach (Asparouhov & Muthén, 2014) was utilized to predict class membership in the two-class solution with key variables after determining the appropriate number of classes (Figure 4). This was done with the R3STEP option in Mplus (Muthén & Muthen, 1998-2017). Class membership predictors included wives' and husbands' reports of depressive symptoms, relational satisfaction, marital power, partner attachment behaviors, conflict resolution ability, history of having a chronic illness, sexual frequency, education, being white versus not being white, age, as well as if the

couple has children or not, marital length, and husbands' physical symptoms and husbands' poor sleep quality.

Missing Data

Across all variables, there was little missing data (average % missing: 5%; maximum % missing: 14%). The assumption that the data were missing-at-random (MAR) was considered plausible as missingness across all variables could be predicted. Therefore, multiple imputation was used to account for missing data by creating 20 imputed datasets in Mplus and then pooling variables across the datasets in the previously described analyses.

Results

Hypothesis One: Different Classes

Hypothesis one, that *Different groups (classes) of pregnant couples exist in terms of wives' and husbands' sexual satisfaction, after adjusting for pregnancy-related biological factors,* was supported. As noted previously in the analysis section, two classes of couples emerged: one class denoted as "more satisfied" (n = 413 couples) and another denoted as "less satisfied (n = 110 couples) based on class intercept values. Intercepts of the sexual satisfaction items in this two-class solution are provided in Table 3. Additionally, Cohen's d's (Cohen, 1988)—measures of whether a difference between two means (or intercepts) is considered small (Cohen's d = .2–.3), medium (Cohen's d = .5), or large (Cohen's $d \geq$ .8)—are presented in Table 3 to illustrate the magnitude of differences on sexual satisfaction items between classes. Intercepts are plotted in detail in Figure 5. Differences in the intercepts between the classes are described next.

Couples in the "more satisfied" class had higher intercept values across all of the sexual satisfaction items as compared to the "less satisfied" class. Both members of the couple were

moderately higher to much higher in their sexual satisfaction with creativity and variety (Wives: Difference = .75; Cohen's d = .79; Husbands: Difference = .50; Cohen's d = .47), frequency (Wives: Difference = .64; Cohen's d = .56; Husbands: Difference = .54; Cohen's d = .46), initiation patterns (Wives: Difference = .89; Cohen's d = .87; Husbands: Difference = .41; Cohen's d = .37), and love and affection (Wives: Difference = .51; Cohen's d = .53; Husbands: Difference = .51; Cohen's d = .51) as compared to the "less satisfied" class. Couples in the "more satisfied" class were slightly higher on their sexual satisfaction with orgasm for husbands (Difference = .19; Cohen's d = .25) and very much higher on their sexual satisfaction with orgasm for wives (Difference = 2.10; Cohen's d = 1.92) as compared to the "less satisfied" class. In terms of the response categories, sexual satisfaction across all items for those in the "more satisfied" class was close to "satisfied" (mean across all five items = 3.92) and was between "neutral" and "satisfied" for couples in the "less satisfied" class (mean across all five items = 3.22).

Hypothesis Two: Prediction of Class Membership

Hypothesis two, that *Non-pregnancy-related biological factors, psychological factors, and social factors will predict membership in the groups identified in hypothesis one*, was supported in one way. Wives' depressive symptoms significantly predicted membership in The "more satisfied" class over The "less satisfied" class at $p < .05$ (Model 6: B = -.96, $p < .01$; odds ratio: .38). This odds ratio suggests that, holding all other variables constant, a one-unit increase in wives' depressive symptoms is associated with a 62% decrease in the odds of being in the "more satisfied" class over the "less satisfied" class. No other factors significantly predicted class membership (see Table 4).

Discussion

The current study provides insight into how the sexual satisfaction during pregnancy differs between couples and what factors do or do not distinguish couples who experience the best sexual satisfaction during pregnancy. In turn, I discuss two implications of the current study including (1) when adjusting for pregnancy-related biological factors, there are two subsets of couples that differ in terms of wives' and husbands' sexual satisfaction and most couples are part a generally sexually satisfied subset and, (2) depressive symptoms for wives' is a major factor that distinguishes couples who are more sexually satisfied in pregnancy from those who are less satisfied.

Two Subsets Pregnant Couples in Terms of Sexual Satisfaction

Using U.S. nationally representative data from 523 pregnant married couples, I identified two classes of pregnant couples based on their reports of sexual satisfaction adjusting for pregnancy-related biological factors. Identifying these classes after adjusting for pregnant-related biological factors—including wives' physical symptoms, wives' sleep quality, and the number of weeks pregnant—was valuable as it allowed me to see how sexual satisfaction differs among couples after accounting for pregnancy-related factors that are likely beyond the couple's control. This adjustment improves the generalizability of findings and enables application of the current study to pregnant couples irrespective of the severity of physical symptoms a wife may experience, wife's sleep quality, or the number of weeks the couple is pregnant.

The two subsets of couples differed in terms of various domains of wives' and husbands' sexual satisfaction. The first, smaller subset ($n = 110$), was less satisfied with sex as compared to the second, larger subset ($n = 413$) in terms of wives' and husbands' satisfaction with the amount of creativity and variety in sex, how often sex occurs, patterns of who initiates sex, the amount of

love and affection in sex, and orgasm frequency. Differences in these domains between the groups were medium in size for husbands, and medium to large in size for wives with two exceptions: the effect size of the difference in satisfaction with orgasm for husbands was small but the effect size of this same difference for wives was very large.

This large difference in orgasm satisfaction between women in the two groups of couples provides one intervention point for improving the sexual satisfaction of women and couples during pregnancy. Medical providers, practitioners and therapists who help women achieve more satisfaction around orgasm will likely see couples experience better sexual satisfaction during pregnancy and in turn, better outcomes in terms of relationships and psychological health (Impett et al., 2014) and child wellness (Hewison, 2013; Surkan & Poteat, 2011). These professionals may have more success promoting orgasm satisfaction in pregnancy as they take an individualized approach in line with recent work that illustrated how patterns of sexual desire and sexual arousal differ among women (Leavitt et al., 2019). Specifically, professionals could encourage couples to be mindful of how the pregnant partner is aroused, experiences desire, and reaches orgasm. Importantly, these professionals should counsel couples that these sexual patterns may differ from what they were pre-pregnancy and invite couples to discuss these differences. Also of note, couples could be counseled that having penetrative sex more often may not be the solution to improving orgasm satisfaction (see Lorenz et al., 2019), especially penetrative sex that may be uncomfortable in later trimesters due to the growing size of the child (Jawed-Wessel & Sevick, 2017). Instead, couples could be encouraged to explore sexual behaviors outside of penetrative sex such as oral sex, touching, massaging, and kissing to help couples connect and satisfy sexual desire.

While a large difference in orgasm satisfaction for women existed between the two classes of couples, it is important to note that couples generally had a positive experience with sex after accounting for biological factors beyond their control. When considering sexual satisfaction reports across all the sexual satisfaction items, husbands and wives in the larger, more sexually satisfied class were satisfied overall with sex and husbands and wives in the much smaller, less sexually satisfied class felt neutral—rather than dissatisfied—about sex. This paints a hopeful picture: after accounting for biological factors beyond their control, most pregnant couples in the United States can expect to have a positive sexual experience during pregnancy.

This positive message contrasts with the negative expectations about poor sexual satisfaction a large body of literature would suggest is inevitable (see Jawed-Wessel & Sevick, 2017; von Sydow, 1999). Based on the current study, professionals and couples can adopt positive expectations about sexual satisfaction during pregnancy and in turn be motivated to maintain strong sexual relations. Couples can be encouraged to adapt to other sexual expressions in spite of challenging biological factors and to recognize that these struggles are temporary.

Depressive Symptoms as a Distinguishing Factor

A key contribution of the current study is establishing a link between wives' depressive symptoms and better sexual satisfaction among couples during pregnancy using nationally representative data. I found that lower wives' depressive symptoms was strongly associated with greater likelihood of membership in the more sexually satisfied class over the less sexually satisfied class. That wives' depressive symptoms emerged as the only statistically significant distinguishing factor between the two groups is thought provoking and begs the question as to why wives' depressive symptoms is seemingly so influential. One clue may lie in the fact the depressive symptoms are often comorbid with the physical symptoms of pregnancy and may

therefore be unaddressed because they are incorrectly attributed to pregnancy instead of depressive symptoms (see Bergink et al., 2011). And, because depressive symptoms are undetected while at the same times its effects are present, sexual satisfaction suffers and couples are at a loss for how to improve it.

This finding—which is in line with prior research (Chang et al., 2012; DeJudicibus & McCabe, 2002)—underscores the importance for medical professionals, practitioners and educators to help women maintain good mental health during pregnancy. Beyond suggesting wide adherence to the recent recommendation by the American College of Obstetricians and Gynecologists "that obstetrician-gynecologists and other obstetric care providers screen patients at least once during the perinatal period for depression and anxiety symptoms using a standardized, validated tool" (Committee on Obstetric Practice, 2018, p. e208), pregnant women could be consulted about depressive symptoms throughout pregnancy. Greater focus on mental health during pregnancy would likely result in less depressive symptoms for pregnant women and in turn, better sexual, relational, and psychological outcomes for expectant and new parents (Impett et al., 2014) and better early child outcomes (Surkan & Poteat, 2011).

Limitations and Future Directions

Data with several time points during pregnancy (e.g., each trimester) may have provided more nuanced insights than global recommendations across the entire nine months of pregnancy as provided in the current study. Additionally, more nuanced assessments of sexual satisfaction besides the RELATE assessment (Busby et al., 2001) may have provided further detail about the experience of sexual satisfaction in pregnancy among couples. Future work can correct address these limitations as well as explore differences among couples' sexual satisfaction patterns in the postpartum period.

Conclusion

Challenges to satisfaction with sex naturally occur as part of pregnancy. Contrary to expectations, this study provides evidence that most U.S. couples do well in navigating the sexual challenges in their control, and, further, evidences the importance of helping women have positive mental health during pregnancy. Pregnancy and the anticipation of a new baby can be both a joy and challenge. It is my hope that the current study helps to minimize the challenges of pregnant couples and maximize their joy.

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Table 1. Univariate and Bivariate Statistics of Variables in Classification Model

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 W. SS – Freq.	—												
2 W. SS – Initiation	.56***	—											
3 W. SS – Orgasm freq.	.37***	.47***	—										
4 W. SS – Love/Affection	.45***	.47***	.50***	—									
5 W. SS – Creativity/Variety	.57***	.55***	.54***	.70***	—								
6 H. SS – Freq.	.43***	.41***	.26***	.27***	.35***	—							
7 H. SS – Initiation	.34***	.43***	.18***	.28***	.32***	.71***	—						
8 H. SS – Orgasm freq.	.17***	.15**	.19***	.17***	.20***	.22***	.21***	—					
9 H. SS – Love/Affection	.31***	.38***	.28***	.41***	.35***	.55***	.54***	.39***	—				
10 H. SS – Creativity/Variety	.30***	.38***	.26***	.31***	.36***	.62***	.63***	.34***	.68***	—			
11 W. Physical symptoms	-.13**	-.13**	-.08	-.05	-.05	-.10*	-.08	.05	-.05	-.03	—		
12 W. Poor sleep quality	-.04	.01	-.03	-.05	-.02	.10*	.05	.04	.06	.06	.26***	—	
13 Weeks pregnant	-.06	-.02	-.06	.03	.05	.03	.02	-.00	.01	.03	-.02	.04	—
Mean	3.42	3.38	3.97	4.09	3.73	3.33	3.19	4.49	4.11	3.65	3.64	7.71	21.98
SD	1.16	1.03	1.13	.99	.96	1.19	1.12	.76	1	1.06	2.54	3.62	1.27
Min	1	1	1	1	1	1	1	1	1	1	0	0	1
Max	5	5	5	5	5	5	5	5	5	5	13	18	40

Note. *** $p < .001$, ** $p < .01$, * $p < .05$; W = wife, H = husband, SS = sexual satisfaction, Freq. = frequency, SD = standard deviation.

Table 2. Univariate and Bivariate Statistics of Variables in Logistic Model

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 W. Depressive sympt.	—																
2 H. Depressive sympt.	.21***	—															
3 W. Relational sat.	-.39***	-.26***	—														
4 H. Relational sat.	-.21***	-.41***	.51***	—													
5 W. Marital power	-.35***	-.20***	.65***	.44***	—												
6 H. Marital power	-.22***	-.36***	.43***	.62***	.49***	—											
7 W. Partner attachment	-.40***	-.28***	.72***	.51***	.71***	.47***	—										
8 H. Partner attachment	-.28***	-.40***	.49***	.65***	.48***	.66***	.51***	—									
9 W. Conflict resolution	-.39***	-.23***	.63***	.44***	.67***	.48***	.63***	.43***	—								
10 H. Conflict resolution	-.23***	-.40***	.47***	.64***	.47***	.71***	.49***	.60***	.57***	—							
11 H. Physical symptoms	.12*	.48***	-.14**	-.15**	-.13**	-.23***	-.16**	-.21***	-.17***	-.18***	—						
12 H. Poor sleep quality	-.07	.31***	-.03	-.05	-.00	-.02	-.06	-.14**	-.04	-.09	.28***	—					
13 W. Had chronic Illness	.19***	.04	-.05	.04	-.02	.01	-.02	-.06	-.00	.03	.08	-.00	—				
14 H. Had chronic Illness	.11*	.24***	.02	-.06	.01	-.10	-.02	-.11*	-.04	-.09	.20***	.18***	.23***	—			
15 Couple has children	-.23***	.01	.26***	.14**	.23***	.21***	.26***	.19***	.20***	.13**	-.05	.11*	-.02	.02	—		
16 W. Sexual frequency	-.07	-.13*	.17**	.17***	.08	.16**	.14**	.13**	.06	.14**	-.04	.06	-.03	.03	-.02	—	
17 H. Sexual frequency	-.06	-.20***	.13*	.21***	.05	.22***	.09	.17***	.07	.20***	-.11*	.02	-.01	-.02	-.09	.76***	—
Mean	1.64	1.51	4.29	4.27	4.06	4.03	4.22	4.29	2.93	2.94	2.62	6.54	.55	.42	1.55	3.85	3.83
SD	.46	.44	.99	.92	.76	.74	.74	.68	.57	.56	2.44	4.21	.5	.49	.5	1.14	1.15
Min	1	1	0	0	1	1	1	2	1	1	0	0	0	0	1	1	1
Max	4	4	5	5	5	5	5	5	4	4	13	34	1	1	2	7	7

Note. *** $p < .001$, ** $p < .01$, * $p < .05$; W = wife, H = husband, sat = satisfaction, sympt = symptoms, SD = standard deviation.

Table 3. Intercepts of Wives and Husbands Sexual Satisfaction Items in Final Adjusted Two Class Solution

	Class Intercepts			
Sexual Satisfaction Item	1	2	2 – 1	Cohen's *d*
Wives				
How satisfied are you with . . .				
the amount of creativity and variety in your sexual relationship with your partner?	3.19	3.94	.75	.79
how often you currently have sex with your partner?	2.99	3.63	.64	.56
the pattern of who initiates sex in your relationship?	2.71	3.60	.89	.87
the amount of love and affection there is in your sexual relationship with your partner?	3.70	4.21	.51	.53
how often you are orgasmic during sex with your partner?	2.34	4.44	2.10	1.92
Husbands				
How satisfied are you with . . .				
the amount of creativity and variety in your sexual relationship with your partner?	3.30	3.80	.50	.47
how often you currently have sex with your partner?	2.94	3.48	.54	.46
the pattern of who initiates sex in your relationship?	2.92	3.33	.41	.37
the amount of love and affection there is in your sexual relationship with your partner?	3.71	4.22	.51	.51
how often you are orgasmic during sex with your partner?	4.32	4.51	.19	.25
n	110	413	303	—
%	21%	79%	58%	—

Note. Response categories available were: 1 = Very dissatisfied, 2 = Dissatisfied, 3 = Neutral, 4 = Satisfied, 5 = Very satisfied.

Table 4. Logistic Prediction of Membership in The "more satisfied" class over The "less satisfied" class

	Null		Bio		Psycho		Social		Full		Final	
	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE
H. Physical symptoms			-.06	(.06)					-.06	(.07)		
H. Poor sleep quality			.03	(.04)					.04	(.05)		
W. Has had chronic illness			-.43	(.40)					-.29	(.42)		
H. Has had chronic illness			-.35	(.37)					-.33	(.40)		
W. Depressive symptoms					-.93*	(.37)			-.69†	(.41)	-.96**	(.37)
H. Depressive symptoms					-.15	(.34)			.06	(.49)		
W. Relational satisfaction							.14	(.24)	.10	(.25)		
H. Relational satisfaction							.07	(.29)	.14	(.31)		
W. Marital power							.27	(.33)	.23	(.34)		
H. Marital power							-.17	(.41)	-.25	(.43)		
W. Partner attachment behaviors							.21	(.36)	.23	(.37)		
H. Partner attachment behaviors							.02	(.43)	-.07	(.48)		
W. Conflict resolution ability							-.13	(.45)	-.36	(.49)		
H. Conflict resolution ability							.07	(.49)	.17	(.52)		
Couple has children	.19	(.24)	.18	(.27)	.12	(.27)	.10	(.30)	.06	(.33)	.11	(.27)
W. Sexual frequency	.09	(.19)	.07	(.20)	.07	(.2)	.00	(.20)	.00	(.20)	.07	(.2)
H. Sexual frequency	.29	(.19)	.31	(.20)	.28	(.19)	.34†	(.19)	.34†	(.21)	.29	(.19)
W. Education	-.15	(.13)	-.14	(.14)	-.14	(.14)	-.11	(.14)	-.12	(.14)	-.14	(.14)
H. Education	.13	(.11)	.12	(.12)	.12	(.12)	.10	(.12)	.10	(.13)	.12	(.12)
W. Is white	.14	(.48)	.08	(.47)	.12	(.5)	.13	(.52)	.09	(.51)	.11	(.5)
H. Is white	-.51	(.54)	-.47	(.53)	-.51	(.53)	-.57	(.56)	-.49	(.54)	-.50	(.54)
W. Age	.02	(.04)	.02	(.05)	.01	(.04)	.01	(.05)	.01	(.05)	.01	(.04)
H. Age	-.04	(.03)	-.04	(.03)	-.04	(.03)	-.04	(.03)	-.04	(.04)	-.04	(.03)
Couple marital length	-.22	(.21)	-.23	(.23)	-.19	(.22)	-.23	(.22)	-.18	(.25)	-.19	(.22)

Note. ** $p < .01$, * $p < .05$, † $p < .10$; W = wife, H = husband; *n* of the "less satisifed" class = 110, *n* of the "more satisifed" class = 413; odds of being in the "more satisifed" class over the "less satisifed" class are 3.76:1.

Figure 1. Individual and Couple Sexual Satisfaction in Pregnancy in the Context of Family Systems Theory and the Biopsychosocial Model
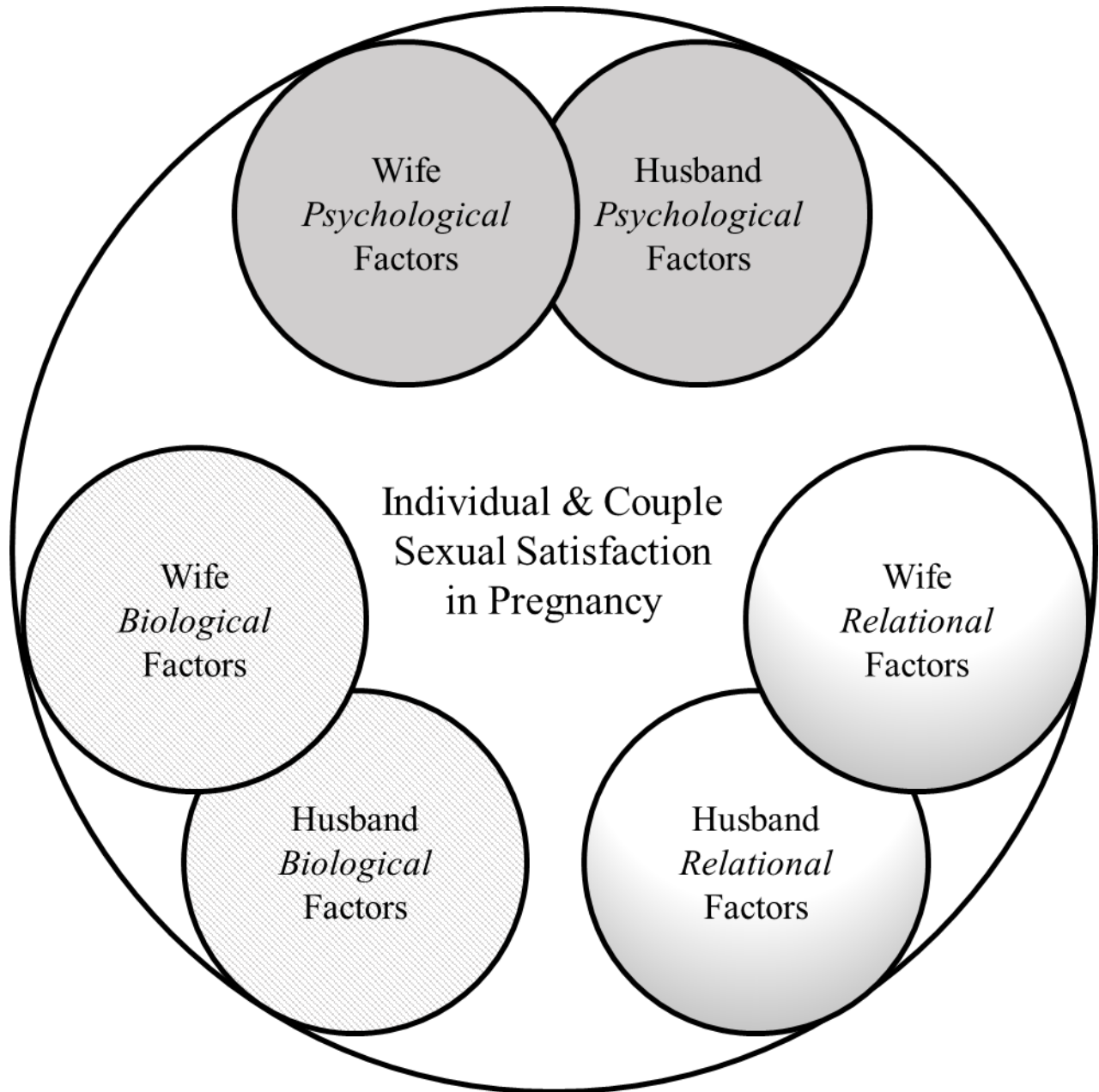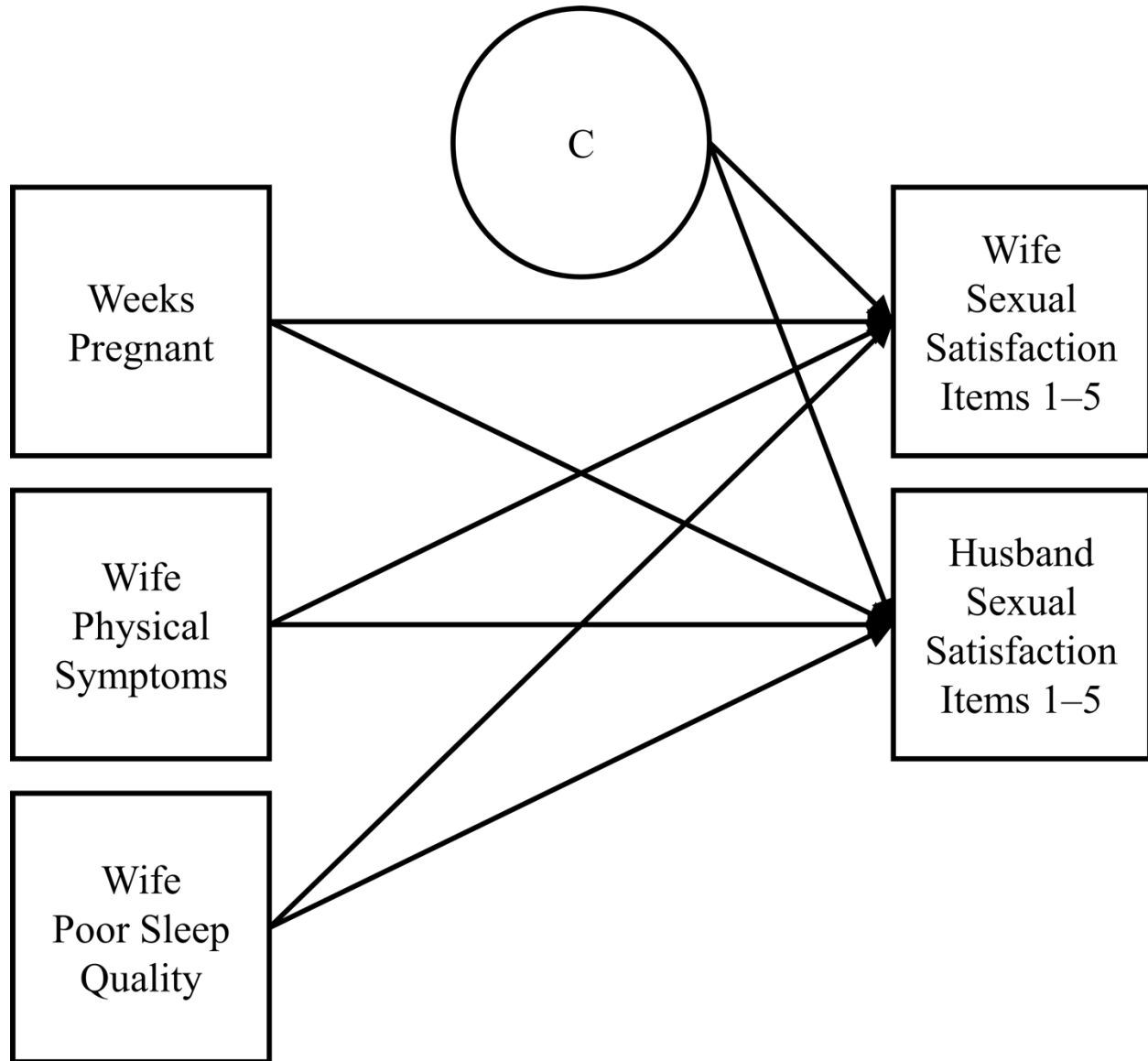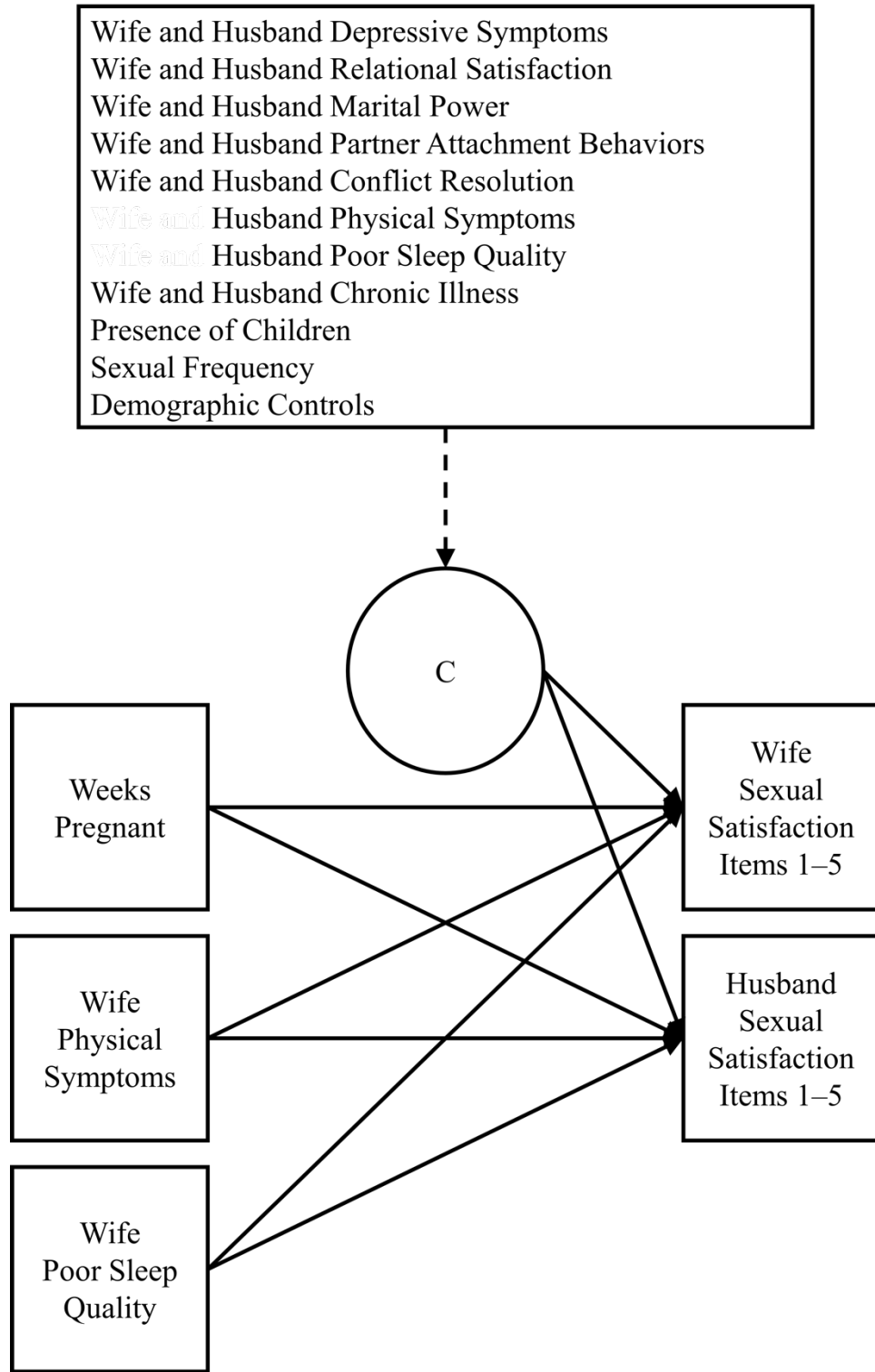
Figure 2. Latent Profile Analysis Step 1

Note. Arrows from "C" to exogenous variables indicate "the intercept of [the exogenous variables] varies[s] across the classes of [C]" (Muthén & Muthen, 1998-2017, p. 171); the arrows from "weeks pregnant," "wife physical symptoms," and "wife poor sleep quality" indicate regression paths that adjust classification for these three pregnancy-related biological factors.

Figure 3. Plots of Latent Profile Analyses Not Adjusted for Pregnancy-Related Biological Factors and Latent Profile Analyses Adjusted for Pregnancy-Related Biological Factors
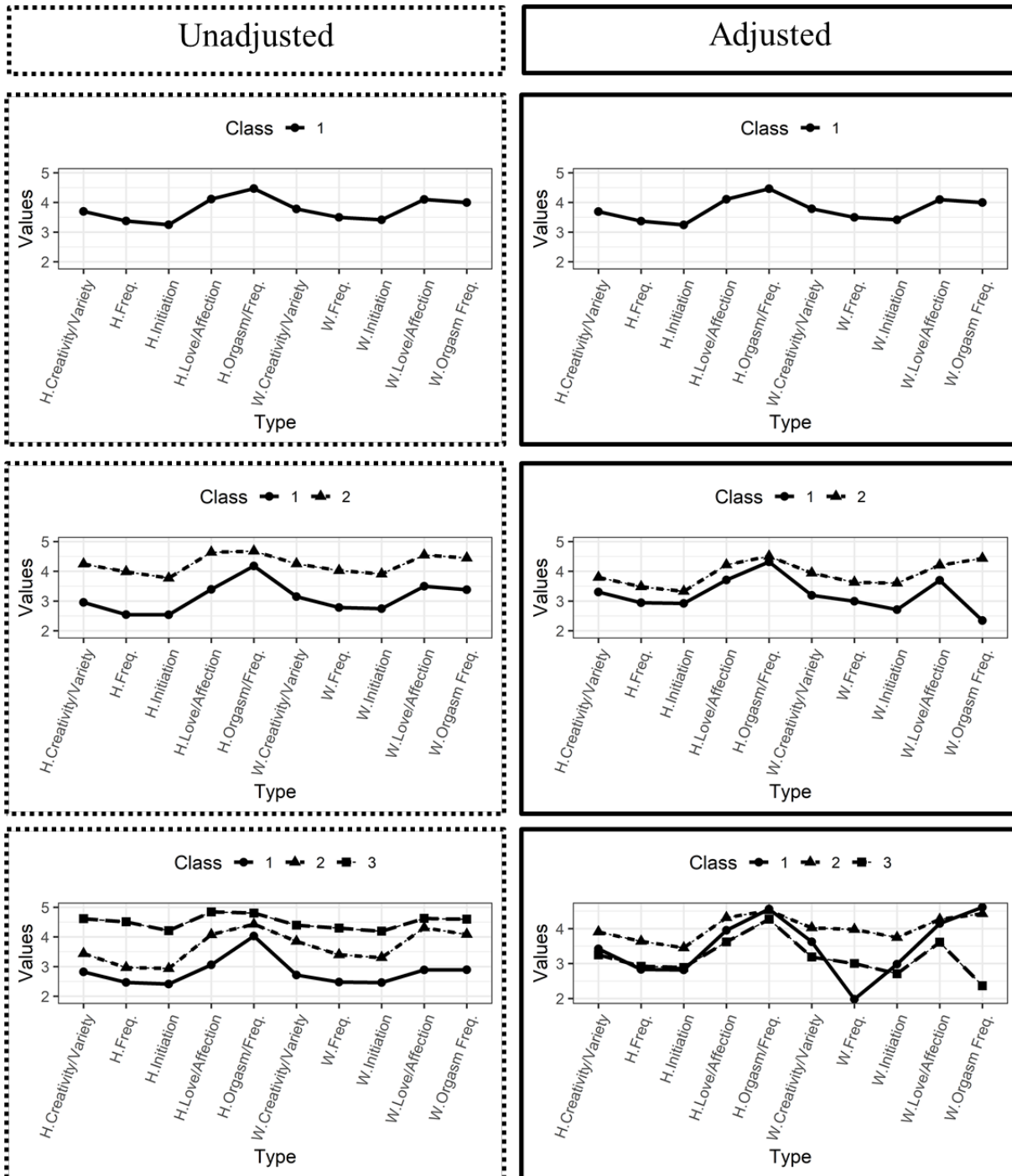

Note. Adjusted latent profile analyses were adjusted for pregnancy-related biological factors of wife's physical symptoms, wife's poor sleep quality and number of weeks pregnant; Response categories available were: 1 = Very dissatisfied, 2 = Dissatisfied, 3 = Neutral, 4 = Satisfied, 5 = Very satisfied. In the final two class adjusted solution, *n* of class 1 (the "less satisifed") = 110, *n* of class 2 (the "more satisifed") = 413.

Figure 4. Latent Profile Analysis Step 2

Wife and Husband Depressive Symptoms
Wife and Husband Relational Satisfaction
Wife and Husband Marital Power
Wife and Husband Partner Attachment Behaviors
Wife and Husband Conflict Resolution
Wife and Husband Physical Symptoms
Wife and Husband Poor Sleep Quality
Wife and Husband Chronic Illness
Presence of Children
Sexual Frequency
Demographic Controls

C

Weeks Pregnant

Wife Physical Symptoms

Wife Poor Sleep Quality

Wife Sexual Satisfaction Items 1–5

Husband Sexual Satisfaction Items 1–5

Note. Dashed lines indicate what step 2 involves over step 1.

Figure 5. Intercept Plot of Final Two Class Latent Profile Analysis Adjusted for Pregnancy-Related Biological Factors
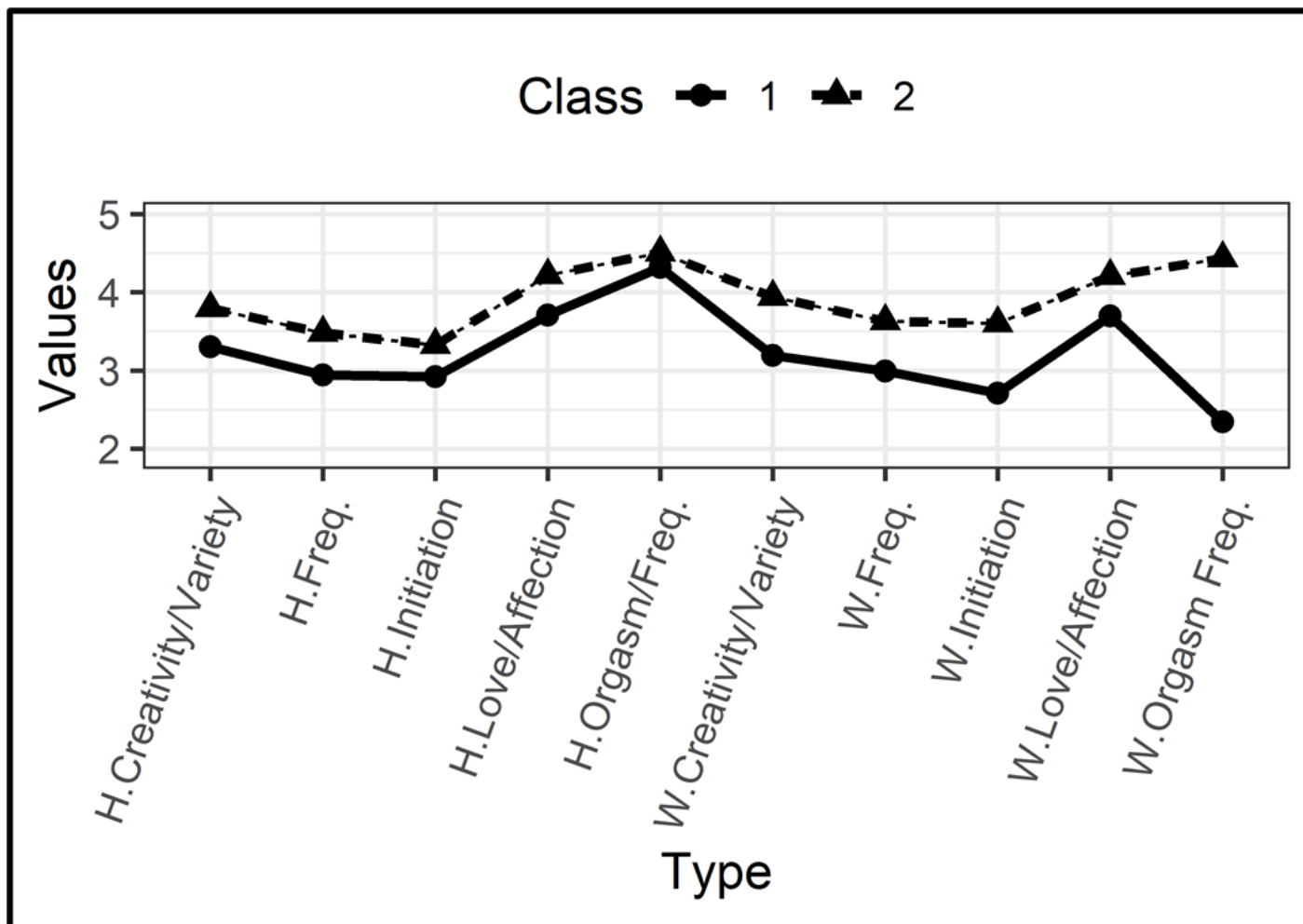
Note. Response categories available were: 1 = Very dissatisfied, 2 = Dissatisfied, 3 = Neutral, 4 = Satisfied, 5 = Very satisfied; *n* of class 1 (the "less satisifed") = 110*, n* of class 2 (the "more satisifed") = 413.

Appendix

The six marital power items are listed below for reference:

1. My partner tends to discount my opinion.

2. My partner does not listen to me.

3. When I want to talk about a problem in our relationship, my partner often refuses to talk

   with me about it.

4. When we do not agree on an issue, my partner gives me the cold shoulder.

5. I feel free to express my opinion about issues in our relationship.

6. My partner and I talk about problems until we both agree on a solution.