Trajectories of Sexual Well-Being Among Couples in the Transition to Parenthood

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Sexual well-being is an important contributor to romantic relationship quality, health, and quality of life, yet couples face significant disruptions to their sexuality during the transition to parenthood. While there is evidence of variability in the sexual well-being of new parents, distinct classes of dyadic trajectories have not been established. Sexual frequency, desire, satisfaction, and distress are each unique components of sexual well-being and may follow different patterns of change within couples. We sought to establish classes of trajectories of four aspects of sexual well-being for couples in the transition to parenthood as well as the associations among identified classes. Couples ($N = 203$) expecting their first child completed online standardized measures of sexual well-being at 20 and 32 weeks in pregnancy and at 3, 6, 9, and 12 months postpartum. Dyadic latent class growth analyses were conducted to identify classes of trajectories for each facet of sexual well-being, and dual trajectory analyses examined the probability of group membership across classes. Couples' sexual well-being over time was heterogeneous. Sexual frequency had two classes: high (33%) and low (67%); sexual desire had three classes: moderate (36%), high (25%), and discrepant (39%); sexual satisfaction had two classes: high (64%) and low (36%); and sexual distress had two classes: low (76%) and discrepant (24%). Overlap in classes of sexual well-being was variable such that high and low or discrepant (between partners) classes did not always co-occur. Findings provide more nuanced information about new parents' postpartum sexual health, which may facilitate early assessment and intervention.

Keywords: transition to parenthood, sexual satisfaction, sexual desire, trajectories, postpartum couples

Supplemental materials: http://dx.doi.org/10.1037/fam0000689.supp

Researchers and clinicians have suggested that a satisfying sexual relationship can fulfill basic needs for connection and intimacy and help individuals cope with stress, with both direct and indirect implications for physical and mental health (see Diamond & Huebner, 2012 for review). However, consistent with biopsychosocial theories of sexual well-being, the transition to parenthood—pregnancy through the year following the birth of a child—is an especially vulnerable period for sexual well-being given the myriad of biological, psychological, and relational changes that emerge (McBride & Kwee, 2017). While most prospective parents have positive expectations for their ability to navigate the transition, including that their sex lives will return to normal after the baby is born (Harwood, McLean, & Durkin, 2007), the unfortunate reality is that the vast majority of expectant and new parents report many novel sexual concerns (e.g., lack of time or energy for sex, desire discrepancies between partners,

poorer body image; Schlagintweit, Bailey, & Rosen, 2016; Vannier & Rosen, 2017).

New parents (as individuals) and new parent couples (as dyads) face a diverse set of experiences that likely shape their trajectories of sexual well-being. While there is some evidence of variability in sexual well-being among new parents (Ahlborg, Dahlöf, & Hallberg, 2005; De Judicibus & McCabe, 2002), most research has examined this at the level of the individual rather than the dyad. Additionally, no research has accounted for potential heterogeneity in change over time by modeling distinct classes of trajectories across the transition to parenthood. Given the inherently interpersonal nature of sexual well-being and the shared experience of becoming parents, a dyadic approach is essential to obtaining an accurate and functionally relevant picture of change over time. In this study, we sought to establish distinct classes of trajectories at the level of the dyad rather than at the level of the individual for four facets of sexual well-being (i.e., sexual frequency, sexual desire, sexual satisfaction, and sexual distress) to account for the interdependence of the sexual relationship. We also sought to examine overlap in membership in these trajectories for couples in the transition to parenthood.

Sexual Well-Being in the Transition to Parenthood

The majority of studies of sexual well-being in the transition to parenthood have been cross-sectional or focused on overall sexual function (i.e., an aggregate of sexual desire, arousal, orgasm, satisfaction, and pain) for women who have given birth (McBride & Kwee, 2017). These studies suggest that sexual function improves, on average, over the first year postpartum. In the only study to our knowledge to examine whether mothers show diverse rates of change, the researchers identified three trajectories of sexual function across 3, 6, and 12 months postpartum: 52% of women reported minimal sexual function problems at 3 months and improved the least over time, 35% of women reported moderate sexual function problems at 3 months and improved the most over time, and 13% of women reported marked sexual function problems at 3 months and experienced moderate improvement (Dawson, Vaillancourt-Morel, Pierce, & Rosen, 2020). Such findings point to the heterogeneity of new mothers' sexual experiences. Patterns of change in partners of women who have given birth have not been established.

Much less is known about other aspects of new parents' sexual well-being beyond sexual function, such as sexual frequency, desire (i.e., interest in sexual activity), satisfaction (i.e., overall evaluation of the positive and negative aspects of one's sexual relationship; Lawrance & Byers, 1995), and distress (i.e., negative emotions about one's sex life; DeRogatis, Clayton, Lewis-D'Agostino, Wunderlich, & Fu, 2008), yet it is possible that they too follow distinct trajectories over time. The inclusion of multiple domains of sexual well-being represents a more holistic approach to sexuality that goes beyond the absence of disease or dysfunction (World Health Organization, 2006). Sexual well-being includes behavioral indicators (frequency) and subjective cognitive-affective indicators that capture both the positive (desire, satisfaction) and negative (distress) facets of one's sexual relationship (Laumann et al., 2006; Martin & Woodgate, 2017). Researchers and clinicians have developed and tested theoretical models for understanding each aspect of sexual well-being. For example, the

interpersonal exchange model of sexual satisfaction purports that satisfaction depends on the balance of rewards and costs in the sexual relationship (Lawrance & Byers, 1995); the incentive-motivation model of sexual desire suggests that desire emerges following sexual arousal by a meaningful stimulus (Laan & Both, 2008); the biopsychosocial model of sexual desire emphasizes the intersection of biological, psychological, and social factors in stimulating and maintaining desire over time (Mark & Lasslo, 2018); and evolutionary theories suggest that fluctuations in sexual frequency may be adaptive and serve important functions during reproductive transitions (Lorenz, Ramsdell, & Brock, 2020). Such theories emphasize the unique conceptual underpinnings of these constructs and have important implications for understanding differential patterns of prevalence and change, including over the transition to parenthood.

Indeed, there is growing agreement of the value in differentiating between positive and negative aspects of sexual well-being, with population estimates showing that low sexual satisfaction is much more common than high sexual distress and that low sexual desire and sexual frequency are not necessarily perceived as distressing or unsatisfying (Mitchell et al., 2013). Specifically, although negatively correlated, sexual distress is more strongly related to sexual function and shows a larger response to treatment in clinical trials of sexual dysfunction relative to sexual satisfaction, whereas satisfaction is more strongly related to relationship variables than is distress (Stephenson & Meston, 2010). As another illustration of distinction, this time between sexual frequency and sexual desire, individuals report engaging in sexual activity for a variety of reasons, many of which are unrelated to sexual desire (Meston & Buss, 2007), and that they experience desire without necessarily engaging in sexual activity (Brotto, Heiman, & Tolman, 2009). Taken together, there is both theoretical and empirical evidence to support examining the domains of sexual well-being separately.

Regarding sexual frequency, a systematic review concluded that there is a gradual decline in frequency of vaginal intercourse across pregnancy and that most new parents (78% to 90%) had resumed vaginal intercourse by 3 months postpartum. Further, the frequency of a broad range of sexual behaviors (i.e., manual and oral stimulation, masturbation, and vaginal intercourse) tended to increase, on average, over the first 12 months, returning to prepregnancy levels closer to 12 months (Jawed-Wessel & Sevick, 2017). Though the majority of new parents resume sexual activity, the fact that some do not suggests there may be variability in patterns of sexual frequency over the postpartum period.

Despite resumption of sexual activity postpartum, an increase in sexual desire and sexual satisfaction do not necessarily follow, underscoring the potential for distinct trajectories. The limited available studies, none of which model dyadic interdependence within couples, suggest that women report declines in sexual desire and satisfaction as the pregnancy progresses and that these declines persist into the postpartum period with gradual improvement over time, though not to prepregnancy levels (Ahlborg et al., 2005; De Judicibus & McCabe, 2002). For fathers, the evidence is more mixed, with some studies reporting a decline in sexual desire and satisfaction postpartum and others reporting no changes (Condon, Corkindale, & Boyce, 2004; von Sydow, 1999). Early studies found that fathers' sexual satisfaction is more negatively impacted than is mothers' (Ahlborg et al., 2005; Hyde, DeLamater, Plant, &

Byrd, 1996), an effect that is opposite to sexual desire. Couples also report greater discrepancies in their sexual desire during this period, with fathers having higher desire (N. O. Rosen, Bailey, & Muise, 2017). New parents have less time alone together as a couple, and some experience increased stress and fatigue and more relationship conflict after a baby is born (Cowan & Cowan, 2000). With so many factors contributing to variability in sexual satisfaction and sexual desire, as well as mixed findings between mothers and partners that differ for satisfaction and desire, it seems plausible that multiple and distinct couple trajectories could emerge for these sexual outcomes.

There are very few studies that have examined sexual distress, which includes negative emotions about one's sex life such as guilt, frustration, worry, embarrassment, and anger, during the transition to parenthood and none to our knowledge that are longitudinal. This oversight is surprising given that sexual distress is a criterion for diagnosing sexual dysfunction (American Psychiatric Association, 2013). Sexual distress appears to be common and higher among pregnant and new mothers relative to women not in these periods (Vannier & Rosen, 2017; Zamani, Latifnejad Roudsari, Moradi, & Esmaili, 2018). In fact, nearly 90% of new parent couples endorse more than 10 sexual concerns that they perceive to be moderately distressing (Schlagintweit et al., 2016). Sexual distress may be heightened due to reduced sexual function; lack of time, energy, and privacy for sexual activity; and changes in body image and self-identity (e.g., balance between maternal and sexual parts of the self; Skouteris, Carr, Wertheim, Paxton, & Duncombe, 2005). However, unlike the other facets of well-being, sexual distress may be more responsive to shifts in expectations as parents adjust to their new reality, suggesting the potential for trajectories that diverge from the other facets of well-being.

The Current Study

Taken together, sexual well-being on average appears to decline across pregnancy and shows some gradual improvement over the postpartum period, though not to prepregnancy levels. Some studies provide initial evidence that there is variability in the sexual well-being of expectant and new parents that has not been captured in prior longitudinal studies. For example, cross-sectional studies have found that about a third of couples report increased sexual satisfaction postpartum compared to prepregnancy (Ahlborg, Rudeblad, Linnér, & Linton, 2008).

In addition to variability within a particular aspect of sexual well-being, there may be different trajectories for each sexual outcome. We consider four crucial indicators of sexual well-being in this research—sexual frequency, desire, satisfaction, and distress. In addition, the majority of studies have not taken a dyadic approach, neglecting to consider that some aspects of mothers' and fathers' sexual well-being (e.g., desire) appear to show different patterns over time. It is possible that there are particular patterns within couples in regard to their sexual well-being and with respect to how these patterns correlate. The current study built upon previous research by establishing distinct classes of trajectories of four aspects of sexual well-being for couples in the transition to parenthood, as well as the associations between identified classes. We made no a priori hypotheses regarding the specific number of distinct classes of couples' sexual well-being trajectories, but given prior research (Dawson et al., 2020), we did expect that there

would be more than one class for each variable and that the patterns of change might look different for each sexual outcome. Allowing classes to form freely from our data could reveal a more nuanced understanding of couple sexuality in the transition to parenthood.

Method

Our predictions and analysis plan were preregistered prior to analyzing (but after collecting) the data. This information is available on the Open Science Framework at https://osf.io/kz4d3/, along with the de-identified data and syntax.

Participants and Procedure

From May 2016 to April 2018, first-time mothers and their partners were recruited during pregnancy (range = 13 to 24 weeks, $M = 19.39$ weeks, $SD = 1.56$) online (40.0%), in person from the IWK Health Care Centre diagnostic imaging clinic during their routine 20-week ultrasound appointment (15.3%), or through pamphlets/posters in their doctor's office (17.7%). Other recruitment strategies included community posters (6.0%), newspaper advertisement (0.5%), word of mouth (14.4%), or other means (6.0%). Online Supplemental Figure 1 is a flowchart of participant recruitment and attrition ($N = 203$ couples). The inclusion criteria were (a) being at least 18 years of age; (b) being pregnant with their first child and/or had not previously given birth; (c) having an uncomplicated, singleton pregnancy; (d) being in a romantic relationship of at least 6 months duration; (e) being fluent in English; and (f) each partner having access to a personal e-mail account. Full sociodemographic information for the sample is available in online Supplemental Table 1. Briefly, participants were on average 30 years old and were in a relationship for 6.5 years; 91% were married, 71% were Canadian, 79% were White, and most identified as heterosexual (90% of women and 96% of partners). Most completed postsecondary education, were employed full-time, and had a household income greater than $60,000. Compared to those retained in the analyses, couples who were withdrawn were more likely to be from Canada (89.7%), $\chi^2(1) = 4.22$, $p = .04$, and partners were less likely to identify as heterosexual (71.4%), $\chi^2(1) = 17.83$, $p < .001$.

For in-person recruitment, a clerk gave a brochure about the study to patients deemed eligible based on a prescreen of their requisition. All participants spoke with a research assistant (either in person or via telephone) who described the study and confirmed eligibility. Participants provided informed consent online prior to completing the first survey. Participants were instructed to complete their surveys independently from their partner, via an e-mailed link on Qualtrics. The baseline survey was sent between 18 and 24 weeks pregnant, and follow-ups were sent at 32 weeks pregnant, 2 weeks postpartum, and 3, 6, 9, and 12 months postpartum. Survey links expired after 4 weeks. Participants received reminder e-mails 1 week before each of the surveys, which included an educational pamphlet about fetus or infant development that corresponded with the survey time point. Participants received phone call reminders if they did not complete a survey within 48–72 hr and again 1 and 3 weeks later. Both partners were eligible to receive gift certificates to Amazon.ca or Amazon.com up to a total of $105 CDN. The study was approved by the ethical

review boards at Dalhousie University and the University of Toronto Mississauga.

Measures

Participants reported on relevant sociodemographic information in the baseline survey and on their sexual well-being at all six time points. Labor and delivery characteristics were collected in a survey at 2 weeks postpartum.

Sexual frequency. Participants reported how often they and their partner engaged in partnered sexual behaviors (giving oral sex, receiving oral sex, giving manual stimulation, receiving manual stimulation, intercourse with vaginal penetration, and intercourse with anal penetration) during the past 4 weeks using the scale $0 = not\ at\ all$, $1 = once\ or\ twice$, $2 = once\ per\ week$, $3 = 2-3\ times\ per\ week$, $4 = 4-5\ times\ per\ week$, $5 = once\ a\ day$, and $6 = more\ than\ once\ a\ day$. Total scores ranged from 0 to 36, with higher scores indicative of more frequent and/or varied sexual activities. Because sexual frequency total scores were highly correlated between partners across time points, $rs(162–203) = 0.58–0.75$, the average of mothers' and partners' reports was used. When one member of the couple did not report their sexual frequency, the reported frequency from the other member of the couple was used to reflect the total score for the couple. The sexual frequency items showed strong internal consistency in the current study for mothers and partners (Cronbach's alpha = .83 to .87 and .84 to .89, respectively).

Sexual desire. Sexual desire was assessed using two items from the Female Sexual Function Index (FSFI; R. Rosen et al., 2000; e.g., "Over the past 4 weeks, how often did you feel sexual desire or interest?") and two nearly identical items from the International Index of Erectile Function (IIEF; R. C. Rosen et al., 1997), for women and men, respectively. The two items were summed to give a subscale score (2 to 10), where higher scores reflect greater desire. Scoring for the desire subscale followed that described for the IIEF (i.e., summing) and not the FSFI. Total scores less than 5 indicate clinically significant low desire (Gerstenberger et al., 2010). The two measures showed strong internal consistency in the current study for mothers and partners (Cronbach's alpha = .89 to .91 and .86 to .89, respectively).

Sexual satisfaction. Sexual satisfaction in the previous 4 weeks was assessed using the Global Measure of Sexual Satisfaction (GMSEX; Lawrance & Byers, 1995). This well-validated measure assesses participants' subjective global satisfaction with their sexual relationship using five items rated on 7-point bipolar scales (e.g., *good-bad, satisfying-unsatisfying*). Items were summed to provide a total score (5 to 35), where higher scores reflect greater sexual satisfaction. The GMSEX showed strong internal consistency in the current study for mothers and partners (Cronbach's alpha = .93 to .96 and .94 to .96, respectively).

Sexual distress. Distress about one's sex life was assessed using the 13-item Female Sexual Distress Scale (FSDS; DeRogatis et al., 2008; e.g., "In the past 4 weeks, how often did you feel distressed about your sex life?"). The FSDS also has been validated for use in men (Santos-Iglesias, Mohamed, Danko, & Walker, 2018). Total scores range from 0 to 52, with higher scores indicative of greater sexual distress. Scores greater than 11 indicate clinically significant distress associated with sexual problems (DeRogatis et al., 2008). The FSDS has demonstrated good psy-chometric properties and showed strong internal consistency in the current study for mothers and partners (Cronbach's alpha = .93 to .96 and .92 to .94, respectively).

Data Analyses

We calculated descriptives with SPSS V. 25.0 and conducted all other analyses with Mplus Version 8.2 using the maximum likelihood estimator. Prior to calculating total scores, we used maximum likelihood imputation for item-level missing data provided that the missing data were less than 20% of the total number of items in a given measure (Newman, 2003). We conducted bivariate correlations among our sexual well-being variables at each time point.

We examined trajectories through latent class growth analysis (LCGA) and dyadic LCGA (DLCGA). These approaches account for heterogeneity in longitudinal patterns of sexual well-being because the latent classes represent unique trajectories. Participants were distinguished based on the person who gave birth (i.e., mother) and the person who did not (i.e., the partner).[1] We used a single average value for sexual frequency (a total of six variables entered) for the LCGA, and we simultaneously included data from both mothers and their partners across six time points (a total of 12 variables entered) into a single model for the DLCGA. For all models, the first slope loading (baseline) was fixed to zero and the last loading (12 months postpartum) was fixed to one, which allowed the intermediate loadings to vary freely for mothers and partners within and among classes (Mund & Neyer, 2016). This approach does not force the growth curve to follow a specific shape and allows the shape of the trajectories to vary across the latent classes such that mothers and partners within a class could have different-shaped trajectories. We allowed the time-specific residuals and the correlation between the latent intercept and the latent slope to vary freely between latent classes. Means, standard deviations, and slope loadings were freely estimated in each latent class by default, and the intercepts and slopes of the individual classes were constrained to zero (Nagin, 2010).

Models were run with 500 random start values, with the 50 best retained for the final optimization. We established the number of classes for each of our sexual well-being variables using an iterative procedure. We examined results from class solutions until we had three class solutions in a row in which the model fit worsened (van de Schoot, Sijbrandij, Winter, Depaoli, & Vermunt, 2017). The best-fitting classification model was determined by a combination of fit indices: parsimony, size of classes (at least 25 couples in each; Lavner, Bradbury, & Karney, 2012), and interpretability of the trajectories (Nylund, Asparouhov, & Muthén, 2007). The model fit indices included the smallest Bayesian information criteria value (BIC), smallest sample-size adjusted BIC (SABIC), a significant Lo-Mendell-Rubin likelihood ratio test (LMR-LRT), and a significant bootstrap likelihood ratio test (BLRT). Both LRT values test the significance of the improvement in the model when an additional class is extracted (Nylund et al., 2007), with a nonsignificant value suggesting that the model did not improve. Entropy values ranging between zero and one were used to assess

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[1] All participants who gave birth indicated that their gender/sex was woman/female, with one person identifying as a trans woman. We therefore refer to this group collectively as "mothers".

the precision of the individual classification, with higher entropy values corresponding to a clear class separation. The final selected solution was then replicated with 2,000 random start values (with a default of 10 iterations per starting value) to avoid convergence on local maxima.

Next, we conducted dual trajectory analyses (Jones & Nagin, 2007) to examine overlap in membership in each of the classes. We did so by regressing class membership for one trajectory onto class membership for another trajectory, allowing us to examine the posterior probabilities of group membership across classes. When two sets of trajectories with multiple classes were examined together, each couple was then placed into their most likely trajectory class based on the highest posterior probability (e.g., the likelihood of a couple being in both the high sexual satisfaction and high sexual desire classes).

Results

Correlations among the sexual well-being variables at each time point are reported in online Supplemental Tables S2–S7. The ranges of correlations were rs $= -.26$ to .59 for mothers and rs $= -.29$ to .53 for partners, suggesting that our variables were moderately correlated. For each of the sexual well-being outcomes, we first report the average trajectories for mothers and partners (i.e., based on a single class solution but still at the level of the dyad), and then we report on the specific number of dyadic classes and describe the pattern of change for mothers and partners within each unique class.

Trajectories of Sexual Well-Being at the Level of the Dyad

Sexual frequency. Examination of a single trajectory capturing the average change across the sample based on LCGA revealed that the sexual frequency intercept for couples was 7.44 ($SE = 0.35, p < .001$), with an average decline in sexual frequency from baseline to 12 months postpartum (EST (estimate) $= -1.304$, $SE = 0.29, p < .001$). When applying the LCGA analysis, significant heterogeneity in sexual frequency was observed (see Table 1 for model fit indices for the five estimated LCGAs). Most fit indices indicated that the two-class solution was the best-fitting model overall. The two-class solution had the lowest BIC and SABIC alongside significant LMR-LRT and BLRT, the highest entropy value, and sufficient membership in each class. Given that we allowed the means, standard deviations, and slope loadings to be freely estimated, we first report whether there is significant change in the shape of the sexual outcome (i.e., overall change from baseline to 12 months postpartum), and then we describe the shape in reference to Figure 1. Class 1 included 33% of couples ($n = 68$) who engaged in sexual activities frequently. In this class, the sexual frequency intercept was 12.15 ($SE = 0.67, p < .001$), and sexual frequency showed an overall decrease from baseline to 12 months postpartum ($EST = -1.60, SE = 0.50, p = .001$). Class 2 included 67% of couples ($n = 135$) who engaged in sexual activities less frequently. In this class, the sexual frequency intercept was 5.09 ($SE = 0.33, p < .001$), and sexual frequency showed an overall decrease during the transition to parenthood (TTP)

Table 1

Fit Indices for Solutions for Sexual Well-Being Outcomes (Constrained Intercepts and Slopes)

Sexual well-being variable	Class proportions	LL	BIC	SABIC	LMR-LRT p value	BLRT p value	Entropy
Sexual frequency							
1 class	1.00	−3,417.71	6,899.17	6,861.15	NA	NA	NA
2 class	**.33/.67**	**−3,157.05**	**6,393.80**	**6,346.28**	**p = .01**	**p < .001**	**0.911**
3 class	.56/.36/.08	−3,056.28	6,208.20	6,151.17	p = .053	p < .001	0.906
4 class	.36/.31/.06/.26	−3,027.38	6,166.33	6,099.80	p = .39	p < .001	0.824
5 class	.35/.22/.05/.06/.22	−3,012.33	6,152.17	6,076.13	p = .59	p < .001	0.837
Sexual desire							
1 class	1.00	−4,525.45	9,208.29	9,113.24	NA	NA	NA
2 class	.51/.49	−4,299.33	8,784.61	8,673.72	p = .03	p < .001	0.842
3 class	**.36/.25/.39**	**4,157.80**	**8,528.13**	**8,401.40**	**p = .004**	**p < .001**	**0.874**
4 class	.33/.24/.34/.09	−4,104.61	8,448.32	8,305.75	p = .53	p < .001	0.879
5 class	.29/.06/.18/.24/.24	−4,063.62	8,392.89	8,234.48	p = .11	p < .001	0.873
6 class	.14/.23/.22/.28/.07/.06	−4,024.79	8,341.80	8,167.55	p = .54	p < .001	0.874
Sexual satisfaction							
1 class	1.00	−7,322.55	14,804.50	14,709.45	NA	NA	NA
2 class	**.36/.64**	**−7,102.33**	**14,390.62**	**14,279.74**	**p < .001**	**p < .001**	**0.875**
3 class	.17/.45/.37	−7,036.96	14,286.45	14,159.72	p = .23	p < .001	0.825
4 class	.27/.17/.29/.28	−6,992.14	14,223.37	14,080.79	p = .39	p < .001	0.80
5 class	.30/.25/.16/.09/.20	−6,955.37	14,176.40	14,017.98	p = .20	p < .001	0.82
Sexual distress							
1 class	1.00	−8,155.64	16,470.67	16,375.62	NA	NA	NA
2 class	**.76/.24**	**−7,916.13**	**16,018.22**	**15,907.33**	**p = .03**	**p < .001**	**0.918**
3 class	.09/.22/.69	−7,769.97	15,752.46	15,625.73	p = .13	p < .001	0.929
4 class	.07/.08/.61/.24	−7,688.08	15,615.26	15,472.69	p = .11	p < .001	0.917
5 class	.05/.08/.37/.26/.24	−7,611.25	15,488.15	15,329.74	p = .13	p < .001	0.890

Note. LL = model log likelihood; BIC = Bayesian information criterion; SABIC = sample adjusted BIC; LMR-LRT = Lo-Mendell-Rubin likelihood ratio test; BLRT = bootstrap likelihood ratio test; NA = not applicable. Bolded information represents the final solution.
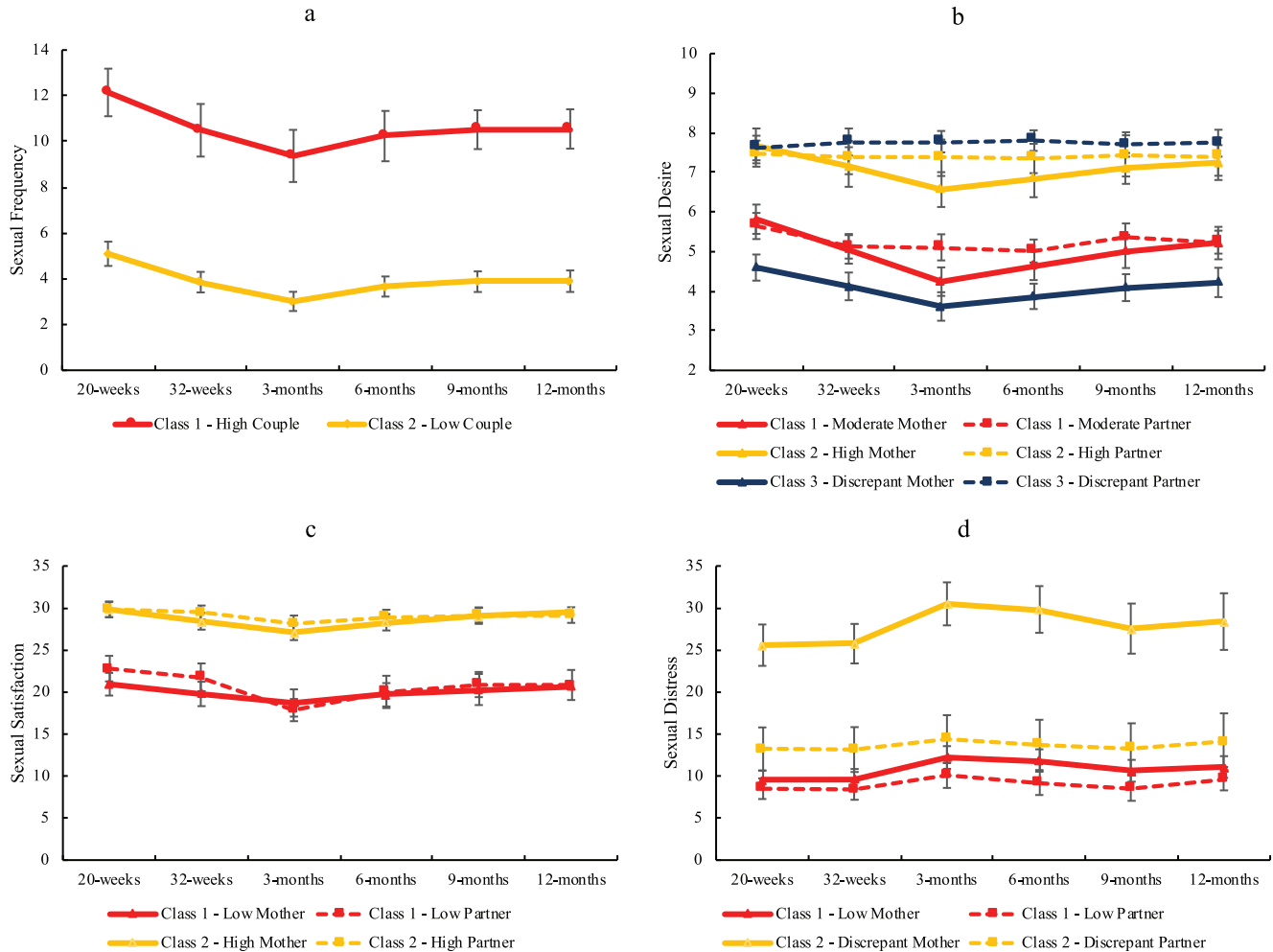
Figure 1. Trajectories of sexual well-being: (a) sexual frequency, (b) sexual desire, (c) sexual satisfaction, and (d) sexual distress. Error bars represent 95% confidence intervals. See the online article for the color version of this figure.

($EST = -1.20$, $SE = 0.27$, $p < .001$). Figure 1a depicts the trajectories. Despite differences between the two classes in reported sexual frequency midpregnancy, sexual frequency declined from midpregnancy to 3 months postpartum and then increased thereafter for both classes; however, even at 12 months postpartum, sexual frequency had not returned to midpregnancy levels in either class.

Sexual desire. Examination of the average trajectory revealed that mothers' (intercept = 5.79, $SE = .14$, $p < .001$; $EST = -0.42$, $SE = 0.16$, $p = .008$) but not partners' (intercept = 6.89, $SE = .12$, $p < .001$; $EST = -0.16$, $SE = 0.13$, $p = .22$) sexual desire declined over time. When applying the DLCGA analysis, significant heterogeneity in sexual desire at the level of the dyad was observed (see Table 1 for model fit indices for the six estimated DLCGAs). Most fit indices indicated that the three-class solution was the best-fitting model overall. The three-class solution had the lowest BIC and SABIC corresponding with significant LMR-LRT and BLRT and sufficient membership in each class. The entropy value was similar to the four-, five-, and six-class

solutions; however, these solutions had nonsignificant LMR-LRT values, suggesting that the additional classes did not improve the model significantly compared to the three-class solution. Figure 1b depicts the trajectories. Class 1 included 36% of couples ($n = 74$) who reported moderate levels of desire. In this class, mothers' sexual desire intercept was 5.82 ($SE = 0.27$, $p < .001$), and their partners' intercept was 5.65 ($SE = 0.25$, $p < .001$). Mothers' sexual desire showed a significant decrease overall from baseline to 12 months postpartum ($EST = -0.60$, $SE = 0.23$, $p = .009$), whereas their partners' sexual desire did not ($EST = -0.41$, $SE = 0.24$, $p = .08$). Class 2 included 25% of couples ($n = 50$) who reported high sexual desire. In this class, mothers' sexual desire intercept was 7.67 ($SE = 0.27$, $p < .001$), and their partners' intercept was 7.47 ($SE = 0.23$, $p < .001$). Mothers' sexual desire showed a significant decrease over time ($EST = -0.42$, $SE = 0.18$, $p = .02$), whereas their partners' desire remained relatively stable ($EST = 0.08$, $SE = 0.15$, $p = .60$). Class 3 included 39% of couples ($n = 79$) who were experiencing a desire discrepancy (i.e., a difference between partners). In this class, mothers' sexual desire

intercept was clinically low (4.60, $SE = 0.19$, $p < .001$), whereas their partners' intercept was high (7.62, $SE = 0.28$, $p < .001$). Mothers' sexual desire showed a significant decrease overall from baseline to 12 months postpartum, always remaining within the clinically low range ($EST = -0.38$, $SE = 0.13$, $p = .003$), whereas their partners' desire remained stable and high ($EST = 0.12$, $SE = 0.26$, $p = .64$). Regardless of the class, mothers' desire showed a similar pattern. Mothers' desire decreased between midpregnancy to 3 months postpartum and then increased from 3 months to 12 months postpartum but did not reach their baseline. In contrast, partners' desire was stable during the same time period.

Sexual satisfaction. Examination of the average trajectory revealed that neither mothers' (intercept = 26.51, $SE = .49$, $p < .001$; $EST = -0.08$, $SE = 0.58$, $p = .89$) nor partners' (intercept = 27.21, $SE = .48$, $p < .001$; $EST = -1.00$, $SE = 0.56$, $p = .08$) sexual satisfaction changed over time. When applying the DLCGA analysis, significant heterogeneity in sexual satisfaction was observed (see Table 1 for model fit indices for the five estimated DLCGAs). Most fit indices indicated that the two-class solution was the best-fitting model overall. The two-class solution had the lowest BIC and SABIC alongside significant LMR-LRT and BLRT and had the highest entropy value, suggesting clear class separation, and there was sufficient membership in each class. Figure 1c depicts the trajectories. Class 1 included 36% of couples ($n = 74$) in which both mothers and partners were low in sexual satisfaction. In this class, mothers' sexual satisfaction intercept was 20.93 ($SE = 0.90$, $p < .001$), and their partners' intercept was 22.79 ($SE = 0.88$, $p < .001$). Mothers' sexual satisfaction did not change significantly over time ($EST = -0.24$, $SE = 0.46$, $p = .61$), whereas partners' sexual satisfaction showed an overall decrease from baseline to 12 months postpartum ($EST = -1.95$, $SE = 0.97$, $p = .045$). Class 2 included 64% of couples ($n = 129$) with high and stable sexual satisfaction. In this class, mothers' sexual satisfaction intercept was 29.83 ($SE = 0.60$, $p < .001$), and their partners' intercept was 29.83 ($SE = 0.60$, $p < .001$). Neither mothers' ($EST = -0.29$, $SE = 0.59$, $p = .62$) nor partners' ($EST = -0.67$, $SE = 0.36$, $p = .06$) sexual satisfaction changed significantly over time. As shown in Figure 1c, for partners in Class 1, sexual satisfaction decreased between midpregnancy to 3 months postpartum and improved thereafter, though it did not reach baseline levels, whereas sexual satisfaction remained stable across the TTP for mothers in both classes and partners in Class 2.

Sexual distress. Examination of the average trajectory revealed that neither mothers' (intercept = 13.38, $SE = 0.74$, $p < .001$; $EST = 1.43$, $SE = 0.79$, $p = .07$) nor partners' (intercept = 9.62, $SE = 0.59$, $p < .001$; $EST = 1.14$, $SE = 0.70$, $p = .10$) sexual distress changed over time. When applying the DLCGA analysis, significant heterogeneity in sexual distress was observed (see Table 1 for model fit indices for the five estimated DLCGAs). Most fit indices indicated that the two-class solution was the best-fitting model overall. The two-class solution had the lowest BIC and SABIC alongside significant LMR-LRT and BLRT. The entropy value was similar to the three-class solution; however, the three-class solution had a nonsignificant LMR-LRT and one class size with insufficient membership. Class 1 included 76% of couples ($n = 155$) who were not experiencing clinically significant distress. In this class, mothers' sexual distress intercept was 9.57 ($SE = 1.14$, $p < .001$), and their partners' intercept was 8.50 ($SE = 0.67$, $p < .001$). Mothers' sexual distress showed an overall

increase from baseline to 12 months postpartum ($EST = 1.51$, $SE = 0.65$, $p = .02$), whereas partners' sexual distress did not ($EST = 1.19$, $SE = 0.71$, $p = .10$). Class 2 included 24% of couples ($n = 48$) who were experiencing a distress discrepancy (i.e., difference between partners). In this class, mothers' distress intercept was high and in the clinically significant range (25.58, $SE = 1.43$, $p < .001$), whereas their partners' distress intercept was below the clinical cutoff (13.22, $SE = 2.06$, $p < .001$). Both mothers' ($EST = 2.81$, $SE = 2.10$, $p = .18$) and partners' ($EST = 0.87$, $SE = 1.22$, $p = .47$) distress was stable over time. As shown in Figure 1d, for mothers in Class 1, sexual distress increased between midpregnancy and 3 months postpartum and decreased thereafter, whereas distress for mothers in Class 2 and partners in both classes did not change significantly over time.

Dual Trajectories to Examine Overlap in Trajectory Class Membership

Figure 2 depicts results of the dual trajectory models—that is, the percentages of couples in each of the sexual well-being classes as a function of their membership in other sexual well-being classes. Membership in the moderate desire class (left of Figure 2a) was not significantly associated with odds of membership in the low sexual frequency class in comparison to the high sexual frequency class ($OR = 1.07$, 95% CI [0.41, 2.82], $p = .90$). Membership in the high desire class (middle of Figure 2a) was significantly associated with decreased odds of membership in the low sexual frequency class in comparison to the high sexual frequency class ($OR = 0.07$, [0.03, 0.19], $p < .001$). Membership in the desire discrepant class (right of Figure 2a) was not significantly associated with membership in the low sexual frequency class in comparison to the high sexual frequency class ($OR = 1.07$, [0.405, 2.82], $p = .89$).

Membership in the moderate desire class (left of Figure 2b) was not significantly associated with odds of membership in the low sexual satisfaction class in comparison to the high and stable satisfaction class ($OR = 0.73$, 95% CI [0.34, 1.57], $p = .43$). Membership in the high desire class (middle of Figure 2b) was associated with decreased odds of membership in the low satisfaction class in comparison to the high and stable satisfaction class ($OR = 0.03$, [0.004, 0.23], $p < .001$). Membership in the desire discrepant class (right of Figure 2b) was not significantly associated with membership in the low satisfaction compared to the high satisfaction class ($OR = 1.36$, [0.637, 2.92], $p = .43$).

Membership in the moderate desire class (left of Figure 2c) was not significantly associated with odds of membership in the low sexual distress compared to the discrepant distress class ($OR = 1.32$, 95% CI [0.59, 2.96], $p = .50$). Membership in the high desire class (middle of Figure 2b) was associated with increased odds of membership in the low distress class compared to the distress discrepant class ($OR = 3.796$, [1.25, 11.55], $p = .02$). Membership in the desire discrepant class (right of Figure 2b) was not significantly associated with membership in the low distress class compared to the distress discrepant class ($OR = 0.76$, [0.39, 1.70], $p = .50$).

Figure 2d depicts the percentages of couples in the sexual satisfaction classes as a function of their sexual frequency class. Membership in the low sexual frequency class was significantly associated with increased odds of membership in the low sexual
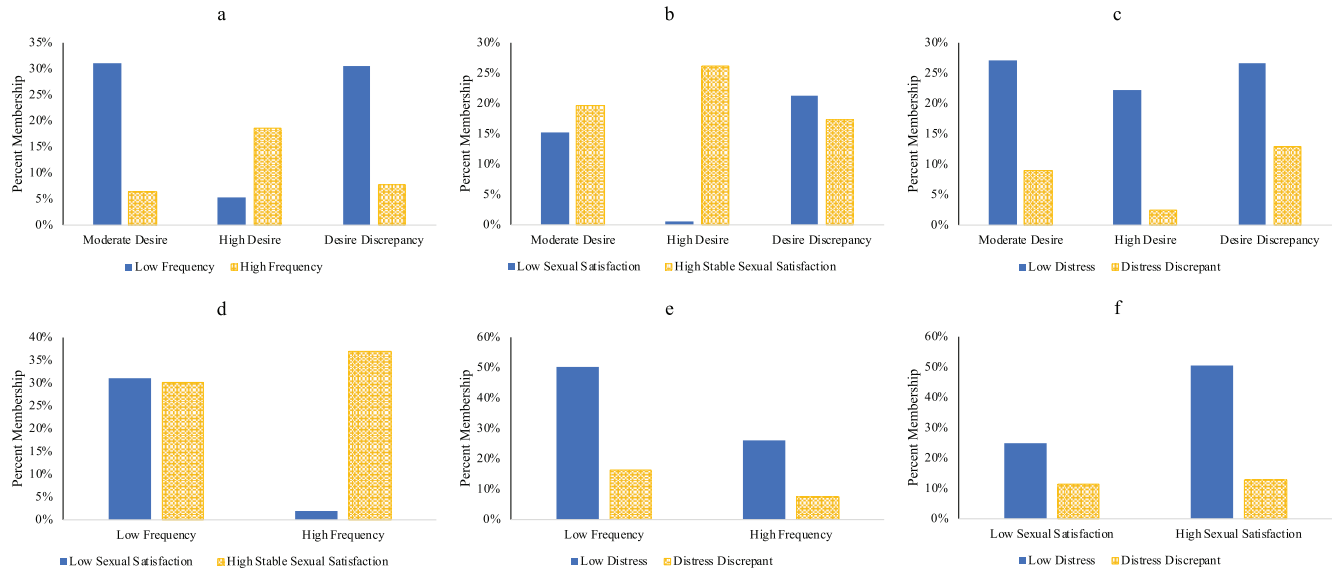
Figure 2. Dual trajectories of sexual well-being classes: (a) sexual desire and sexual frequency, (b) sexual desire and sexual satisfaction, (c) sexual desire and sexual distress, (d) sexual frequency and sexual satisfaction, (e) sexual frequency and sexual distress, and (f) sexual satisfaction and sexual distress. See the online article for the color version of this figure.

satisfaction class ($OR = 19.33$, 95% CI [4.91, 76.01], $p < .001$). Figure 2e depicts the percentages of couples in the low and discrepant sexual distress classes as a function of their sexual frequency class. Membership in the low distress class was not significantly associated with odds of being in the high sexual frequency class ($OR = 1.069$, [0.492, 2.32], $p = .87$). Finally, as seen in Figure 2f, membership in the low sexual satisfaction class was not significantly associated with odds of membership in the low sexual distress class ($OR = 0.49$, [0.23, 1.05], $p = .07$).

Discussion

In a study of 203 new parent couples, we sought to establish unique classes of trajectories of multiple facets of sexual well-being at the level of the dyad from midpregnancy to a year postpartum. Couples' experiences of sexual frequency (two classes; high and low), sexual desire (three classes; moderate, high, and discrepant with mother low and partner high), sexual satisfaction (two classes; high and low), and sexual distress (two classes; low and discrepant with mother high and partner low) were heterogeneous such that for each facet, we observed more than one unique trajectory. In addition, within these dyad-level classes, there was evidence of stability, improving, and worsening of sexual well-being, and this change was not always consistent within the dyad (e.g., mothers declined and partners remained stable). There was also notable overlap—and lack of overlap—in membership in the classes of sexual well-being in meaningful ways; specifically, being in a low or discrepant trajectory for one facet did not necessitate being in a low trajectory for all other facets. Historically, researchers have emphasized individual patterns of change or actor-partner cross-sectional associations in couple sexuality in the transition to parenthood (e.g., Dawson et al., 2020; Muise, Kim, Impett, & Rosen, 2017). Our results uncovered, for the first

time, unique trajectories at the level of the dyad that varied across four domains of sexual well-being among new parent couples.

About a third of couples belonged to the class of high sexual frequency (1–2 times/week) that decreased over time, whereas two thirds fell into a class of low sexual frequency (about once a month) that also decreased over time. Reduced sexual frequency across the transition to parenthood relative to prepregnancy has been reported on average (Jawed-Wessel & Sevick, 2017), with some suggesting that it is adaptive among couples with higher relationship quality (Lorenz et al., 2020). The current study indicates that although all couples reported an overall drop in frequency of sexual activity that was still lower than baseline at 12 months postpartum, some couples maintained relatively high levels. In addition, the drop occurred before 3 months postpartum, and then sexual frequency started to increase afterward in both classes. Had we examined average sexual frequency over the entire transition, as in prior studies, we would have found a decrease, but distinguishing between pregnancy and postpartum presented a more optimistic picture as sexual frequency appeared to increase throughout the postpartum period.

Three classes of trajectories of sexual desire were observed. In all classes, mothers' desire decreased between midpregnancy to 3 months postpartum and then increased from 3 months to 12 months postpartum, whereas partners' desire remained relatively stable. This general pattern at the individual level is consistent with prior research for mothers (McBride & Kwee, 2017). Our findings clarify the mixed evidence regarding fathers' desire (von Sydow, 1999) and suggest that when accounting for the entire transition to parenthood, partners' sexual desire is relatively stable. Factors that affect mothers who gave birth (e.g., recovery from childbirth, breastfeeding, changes in body image) may account for the more consistent declines in sexual desire for mothers than partners

(Mickelson & Joseph, 2012; N. O. Rosen et al., 2017). The current study extends knowledge by establishing classes of trajectories of desire at the dyadic level: About a third of couples reported moderate levels of sexual desire, one quarter of couples had high desire, and the remaining couples (39%) reported a desire discrepancy with mothers reporting clinically low sexual desire. Although desire discrepancies are common for many couples (Mark, 2015), for the desire discrepant class, the difference in desire became more pronounced postpartum (relative to pregnancy). Sexual desire discrepancies among new parent couples are experienced as distressing and have been linked to lower sexual and relationship satisfaction (N. O. Rosen et al., 2017; Schlagintweit et al., 2016). New mothers' sexual desire tends to be more susceptible to social and relational factors (e.g., fatigue, perceptions of partner's desire) relative to new fathers' desire (Hipp, Kane Low, & van Anders, 2012; van Anders, Hipp, & Kane Low, 2013). Such findings underscore the importance of dyadic conceptualizations of new parents' sexuality.

Regarding sexual satisfaction, two thirds of couples had relatively high and stable satisfaction across time. This result is encouraging as it shows that despite the many novel sexual concerns that arise during this transition (Schlagintweit et al., 2016), as well as changes in other aspects of their sexual well-being as demonstrated in our analyses, the majority of couples are able to adapt and remain sexually satisfied. Still, consistent with prior research (Ahlborg et al., 2005), 36% of couples fell into a class in which both members were low in sexual satisfaction. In this class, mothers' satisfaction remained low over time, and partners' sexual satisfaction actually decreased further over time. As there were no classes of sexual desire in which both partners had low desire, it is possible that this drop in satisfaction for partners might be a consequence of also being in the low sexual frequency class or being less likely to be in the high desire class. Future research using experience sampling methods might shed light on whether changes in sexual frequency and desire precede a decline in partners' sexual satisfaction, for example.

The results for sexual distress establish another type of sexual discrepancy between partners experienced in the transition to parenthood. While the majority (76%) of couples fell into the class of no significant sexual distress over time (although mothers did show a significant increase in sexual distress from pregnancy to 3 months and then a decline thereafter), in 24% of couples, mothers reported clinically elevated levels of sexual distress, while their partners did not. The lack of distress in partners is inconsistent with prior cross-sectional studies (Schlagintweit et al., 2016). The current findings suggest that mothers carry a heavier burden regarding negative changes to their sexuality and that partners may be more accepting of the circumstances than mothers think. Indeed, in a qualitative study, new fathers reported low levels of sexual distress as they prioritized expressing love, consideration of their partners' needs (e.g., healing, fatigue), and caring for their new child over sexual activity during this period (MacAdam, Huuva, & Berterö, 2011).

Taken together, we observed different patterns of change across sexual outcomes in terms of the number and description of the classes as well as their overlap with each other. For example, both desire (39%) and distress (24%) had a class illustrating a discrepancy between partners, with the class being larger for desire than distress, whereas this class did not exist for satisfaction. This

variability is consistent with theoretical and empirical evidence that supports the distinction between domains of sexual well-being (e.g., Martin & Woodgate, 2017; Stephenson & Meston, 2010). Regarding the dual trajectories, the classes of low and discrepant (for desire and distress) sexual well-being differed in their overlap with other high/low classes; couples in the desire discrepant class were not more likely to be in the low sexual satisfaction or distress discrepant classes, and couples in the low distress class were not more likely to be in the high sexual satisfaction class. In contrast, couples in the low sexual frequency class were significantly more likely to also fall into the low sexual satisfaction class. These results underscore the value of our multivariate approach by illustrating that being in a low or discrepant class for one facet of well-being does not necessarily mean that a couple will be in low or discrepant classes for other facets of sexual well-being. Care providers should assess for each aspect of sexual well-being in order to tailor their interventions accordingly.

The identified classes of lower sexual well-being point to couples who are likely to be the most at risk for experiencing adverse effects related to poor sexual well-being, such as heightened relationship conflict and dissatisfaction (McNulty, Wenner, & Fisher, 2016), and might benefit the most from early assessment and interventions. Because the components of sexual well-being are correlated to a moderate degree, interventions targeting one facet of sexual well-being might confer benefits in other areas despite the unique trajectories observed in this study. For example, helping couples improve their sexual satisfaction by facilitating adaptive communication around novel sexual concerns (e.g., pain during intercourse, negative body image) or changes in sexual preferences (e.g., nipple sensitivity, timing of sexual activity) could indirectly boost sexual desire and frequency and alleviate distress.

Because we did not include a sample of couples who were not in this period as a comparison and there are no studies to our knowledge that have previously established classes of trajectories for these sexual well-being outcomes, it is possible that the patterns of classes observed in this study are not unique to the transition to parenthood. Our data were correlational, and causal conclusions regarding the overlap in membership classes cannot be inferred.

The sample demographics may limit the generalizability of the findings. A more diverse sample with respect to race/ethnicity, sexual orientation, and gender may yield different trajectories. Future research should investigate biopsychosocial predictors of the classes of sexual well-being trajectories. A recent study of new mothers' sexual function indicated that psychosocial factors (e.g., relationship satisfaction) were better predictors of how sexual function changed over time than were biological factors (e.g., mode of delivery, breastfeeding; Dawson et al., 2020). Thus, theoretically based psychosocial predictors of new parents' sexual well-being may be a good place to start. For example, preliminary evidence suggests that communal motivation (Muise et al., 2017) and perceived partner responsiveness (N. O. Rosen, Williams, Vannier, & Mackinnon, 2020) are relevant to new parent couples' sexuality.

The trajectories of sexual well-being are heterogeneous among couples transitioning to parenthood. Clinicians can share this information about variability with expectant and new parents to help foster realistic expectations and to normalize their experiences. Expectant parents might also feel reassured by the information that

the majority of couples fell into classes of moderate or high sexual desire, high sexual satisfaction, and low sexual distress, yet low sexual frequency was also the largest class. These findings suggest that during the transition to parenthood, many couples are able to adjust their expectations regarding the frequency of sexual activities without experiencing negative consequences to other aspects of their sexual well-being.

Still, there were diverse combinations across individual facets of sexual well-being underscoring additional nuance. The current findings will help clinicians to better identify specific struggles within relationships and point to the value of couple-based interventions that account for both members' sexual experiences. Sizable classes of poorer sexual well-being were identified in this study, and some of these classes overlapped with each other, indicating a high-risk group that could benefit from early assessment (i.e., in pregnancy) and intervention. Given that sexual well-being is strongly tied to overall health and quality of life (Diamond & Huebner, 2012) and that there may be negative implications to the child's development via relationship consequences (Stroud, Meyers, Wilson, & Durbin, 2015), routine follow-up care should include screening for multiple aspects of sexual well-being in both partners to identify those who may require intervention (e.g., referral to sex therapy). In conclusion, establishing trajectories of multiple aspects of sexual well-being provided more nuanced information about sexual health across the transition to parenthood, which may facilitate early assessment and intervention and ultimately contribute to better health and well-being for new parents and their families.

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