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Trajectories of Sexual Self-Efficacy in Middle and Later Life: Do Gender and Time-Varying Contexts of Marital and Menopausal Transitions Matter?

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ABSTRACT

Sexual self-efficacy is a person's sense of confidence and ability in the sexual areas of life. While it is well studied in adolescence and young adulthood, studies on sexual self-efficacy in mid-age and later adulthood are scant. The current study aimed to empirically define sexual self-efficacy, examine how it changed over nearly 10 years, and whether gender and key contexts in aging that are time-varying, such as marital and menopausal transitions, moderate the trajectories among mid-aged and older adults. Participants completed two waves of the Midlife in the United States (MIDUS) surveys ($n = 958$), with over half of the sample being female (54%). Factor analyses validated a one-factor model with a five-item sexual self-efficacy construct at the baseline and time 2. Further, growth curve analyses showed that sexual self-efficacy declined similarly for all participants over 10 years; however, women had significantly lower levels than men. Additionally, compared to those who were married at both time points, those who were unpartnered at both time points had lower levels of sexual self-efficacy. Finally, how women's sexual self-efficacy changed over time depended on menopausal transitions, with older women who were late postmenopausal experiencing steep declines. While findings suggested gender differences in levels of sexual self-efficacy in aging, further study into how relationship statuses, and, for women, how menopausal transitions may affect sexual self-efficacy in later life is warranted.

Introduction

Self-efficacy is important for one's well-being because of its associations with physical and mental health throughout the lifespan (Giblett & Hodgins, 2023; Remm et al., 2023). Sexual self-efficacy refers to a person's confidence in their ability to make healthy sexual decisions and achieve desired outcomes (Ogallar-Blanco et al., 2023). Sexual self-efficacy includes a person's sense of control in acting as their own sexual agent (Closson et al., 2018), and their ability to successfully navigate encountered obstacles (Assarzadeh et al., 2019; Ogallar-Blanco et al., 2023). Sexual self-efficacy has been well studied in adolescent and young adult populations, documenting positive associations between higher sexual self-efficacy and condom use (Brar et al., 2020; Closson et al., 2018), greater sexual communication and relationship satisfaction (Brasileiro et al., 2023; Byers, 2005), and greater sexual satisfaction (Byers, 2005; Nurgitz et al., 2021).

Many existing measures of sexual health and self-efficacy have been developed and validated for younger populations, and details of these measures may not appropriately translate to adults in mid-age and late life. For example, many sexual self-efficacy measures specifically capture contraceptive use (Brar et al., 2020; Closson et al., 2018) and sexual frequency is often utilized as an indicator of sexual satisfaction (McNulty et al., 2016; Young et al., 1998). Mid-age and late adulthood is a developmental period when individuals experience dwindling sexual frequency, possible declining physical health, and, for women, menopause (Karraker et al., 2011; Rusda, 2023; Towler et al., 2023). Thus, measuring contraceptive use and sexual frequency as indicators of sexual health and satisfaction for older adults may not be an accurate reflection of sexual well-being. Instead, measuring a person's sexual self-efficacy, or belief and confidence in themselves to make healthy sexual decisions and act as a sexual agent, may be a more appropriate indicator of sexual well-being in middle age and late adulthood. Psychosocial factors such as sexual self-efficacy are important to maintain a sense of self-determination in healthy aging. While it can change on its own, sexual self-efficacy is also likely associated with contexts that may or may not change while one gets older.

Several circumstances unique to aging adults can influence sexual experiences and well-being in later life. Indeed, prior research has demonstrated that self-efficacy is influential for older adults in other areas of life, such as physical exercise or self-care behaviors (Remm et al., 2023; Wang et al., 2024). Specifically, the perceived locus of control for a person's well-being impacts the general self-efficacy of an individual, such that those who perceive themselves as active influencers of their circumstances have greater general self-efficacy (Giblett & Hodgins, 2023). Previous research has demonstrated that older adults with higher health behavior self-efficacy engage in more healthy behaviors and more frequent exercise (Remm et al., 2023). However, older adults who are receiving health care services are at risk of lower self-efficacy, including those receiving health care services for menopausal symptoms (McAndrew et al., 2009; Whitehall et al., 2021). Studies of sexual well-being in later life indicate that perceptions and

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meanings of sexuality and intimacy change over time (Kolodziejczak et al., 2019; Towler et al., 2023); therefore, perceptions of sexual self-efficacy may have greater impact on sexual well-being in later life than physical ability alone.

Other circumstances unique to older adults may also impact sexual self-efficacy; for instance, research has shown increased levels of widowhood and of divorce and remarriage in later adulthood, also known as "grey divorce" (Stokes et al., 2020). The experiences of the menopause process (Graziottin & Leiblum, 2005; Strauss, 2013), and physical decline (Kolodziejczak et al., 2019) are unique to older and aging adults. Companionship in late life provides a social and relationship context for sexuality, where both companionship and sexuality are important for overall health and well-being (Ramesh et al., 2021). On the other hand, relationship status and transitions in later life are associated with sexual quality of life and can have different implications for older men versus women (Stokes et al., 2020). Importantly, menopause has been largely overlooked in studies focusing on mid- and late-life romantic partnerships and sexual well-being. In the current study, we aimed to obtain a more nuanced understanding about contexts, including gender, and time-varying changes in physical health, marital relationships, and the menopause process and how these affected sexual self-efficacy among mid-aged and older adults (Bagga et al., 2024; Güçlü, 2021; Karraker et al., 2011).

Relationship Context

Recent studies have observed an increase in marital transitions in mid- and late life (Bildtgård & Öberg, 2023; Stokes et al., 2020). These transitions may occur due to "grey divorce," widowhood, remarriage, or cohabitation instead of remarriage (Öberg & Bildtgård, 2021; Stokes et al., 2020). Many studies indicate that sexually active older adults tend to be in committed relationships, suggesting that marital status in older adults impacts sexual expression (Gore-Gorszewska, 2021; von Humboldt et al., 2021). Therefore, the increase of marital transitions in mid- and late life may impact sexual frequency and satisfaction (Gore-Gorszewska, 2021; Yang & Gu, 2021). It is also well established that relationship satisfaction and sexual satisfaction influence each other bidirectionally (Byers, 2005). With these well-documented influences and correlations, it is important to observe how the romantic partnering or dissolutions of relationships relate to sexual well-being for older adults in general, and whether there are gender differences as women enter menopause.

Gender Differences

Further, subjective sexual well-being can be different for older men and women (Laumann et al., 2006; Santos-Iglesias et al., 2016). From a feminist perspective, Allen (2022) posited that sex is biological, and that gender is a social construct. As society has created a false binary (i.e., men/women), oppression stems from power imbalances where women are oppressed on the basis of gender, specifically that women's bodies take on a disproportional amount of work in the reproductive process and that society expects women to be sexually submissive (Allen, 2022). Social constructs of gender contribute to sexual and gender scripts, or social expectations for attitudes, behaviors, and roles in society based on expressed gender, such as emotional detachment for men and prioritizing youth and appearance for women (Scappini & Fioravanti, 2022; Ward et al., 2022). Gendered sexual scripts, or social expectations for men and women throughout courtship and marriage, are reinforced through media and frequently endorse traditional gendered expectations of sexual assertion for men and sexual submission for women (Ward et al., 2022). Adherence to traditional gendered sexual scripts for heterosexual relationships have been linked to lower sexual functioning and higher psychological distress for women (Scappini & Fioravanti, 2022; Ward et al., 2022). Discrepancies in gendered sexual scripts and the lived experiences of women in mid-age and later adulthood provide a basis for the potential effect of menopausal transitions on sexual self-efficacy (Allen, 2022; Strauss, 2013; Ward et al., 2022).

In addition to social gendered scripts, women experience unique physical changes in mid-life due to menopause which impact sexual expression. Menopause is medically defined as "the permanent cessation of menstruation" (Gatenby & Simpson, 2024; Utian, 1999). This is a natural and physical process that menstruating individuals face in mid-life, and is associated with physical changes (McAndrew et al., 2009), psychological changes (Strauss, 2013), and importantly, changes in sexual functioning (Athey et al., 2021; Graziottin & Leiblum, 2005). Past literature has focused primarily on negative changes in sexuality, such as increases in sexual dysfunction (Athey et al., 2021; Graziottin & Leiblum, 2005) and painful or uncomfortable intercourse (Bagga et al., 2024; Bulut et al., 2024). Much of this has been connected to the physiological changes due to menopause, such as vaginal dryness and loss of muscle tone (Gatenby & Simpson, 2024; Rusda, 2023). Hormonal changes have also been associated with these physical symptoms of menopause, as well as psychological symptoms, such as depression and lack of sexual desire (Bagga et al., 2024; Gatenby & Simpson, 2024).

While such associations have been observed and reported, the symptoms and associations are not uniformly experienced by all menopausal women. Some women have reported great relief at the cessation of menstrual periods (Strauss, 2013). Some have also described more freedom and control in their sex lives when they were not worried about a possible pregnancy (Bulut et al., 2024). Still other women have reported an increase in sexual satisfaction during the menopausal transition (Riazi et al., 2021). An important limitation of these prior studies is that many were specific to women's menopausal experience, but few considered the relationship context of the menopause process.

From the perspective of symbolic interactionism, LaRossa and Reitzes (1993) theorized that meaning is continuously constructed by individuals through interactions with others and objects as they move together through the world. In particular, meanings of sexual satisfaction and relationship satisfaction are constructed within couple interactions; hence, sexual self-efficacy and interpretations of menopause may be influenced by interactions with one's sexual partner (LaRossa & Reitzes, 1993; Mannell, 2023). Therefore, assigned meanings and interpretations of the menopausal transition can shift and adapt with the lived experience of pre-, peri, and post-

menopausal transitions over time, which could again differ depending on one's relationship status (Aririguzo et al., 2022; Mannell, 2023; Richard-Davis et al., 2022).

The Current Study

The current study aimed to address gaps in the literature related to sexual self-efficacy for mid-age and older adults in the contexts of marital and menopausal transitions. Specifically, we empirically defined the construct of sexual self-efficacy among mid-aged and older adults at baseline, based on validated measures in prior studies with other populations. We also examined whether sexual self-efficacy would change for mid-aged and older adults over a nearly 10-year span. Further, we considered how time-varying contexts of marital and menopausal transitions might moderate sexual self-efficacy trajectories among mid-aged and older adults. We utilized a nationally representative dataset from the Midlife in the United States (MIDUS) study, where two waves of the longitudinal data were used to examine the following research questions and hypotheses.

We first examined the overall trajectory of sexual self-efficacy over time, and whether these trajectories were similar for older men versus women. Along with aging and a general decline of physical functioning, we expected that sexual self-efficacy would decline over time and that levels of sexual self-efficacy would differ between men and women, specifically that men would demonstrate higher levels of sexual self-efficacy than women (*H1*); however, we did not hypothesize any gender differences in slopes of the overall trajectories because of gaps in prior research. Next, we examined whether marital status and transition moderated the trajectory of sexual self-efficacy over time for older men versus women. Specifically, we expected that those who were consistently unpartnered would have lower levels and a steeper decline in sexual self-efficacy compared with those who were consistently married and those who had marital transitions (*H2*). Third, we examined whether menopause status and transition moderated the trajectory of sexual self-efficacy over time for older women. We expected that postmenopausal women would have lower levels but more stable trajectories of sexual self-efficacy compared with those experiencing pre- and perimenopause (*H3*). Lastly, we explored whether experiences of menopausal transition and transitions in marital status would have a potentially compounding effect on sexual self-efficacy over time. Again, because of limited theoretical support and few empirical studies on the associations of menopausal transitions in the context of marital relationships, we did not have any specific hypothesis for this higher order 3-way interaction for women experiencing both menopausal and marital transition and their levels and trajectory in sexual self-efficacy over time.

Method

Participants

The current study utilized data from the longitudinal studies of Midlife in the United States (MIDUS; Ryff et al., 2015, 2019). The MIDUS studies utilized random digit dialing and a nationally representative sample to examine several psychosocial and health domains related to middle and late life progression. The main surveys in the MIDUS studies have three available data waves currently, each being about 9 years apart. The first study began in 1995–1996 (n = 7,108) and the most recent wave of available data were collected in 2013–2014 (n = 3,294 in MIDUS 3). The measures for sexual self-efficacy were included beginning in the MIDUS 2 main survey, which we used as the baseline of the current study.

Menopause is determined by not having a menstrual period for 12 consecutive months (Gatenby & Simpson, 2024; Strauss, 2013). The average age for menopause in women is 51, and most women experience menopause between the ages of 45 and 54 years (Gatenby & Simpson, 2024; Richard-Davis et al., 2022). The menopause transition is characterized by hormonal changes related to menstruation, and symptoms from these hormonal changes are often present 1–2 years before menopause (perimenopause stage) and may last for several years following menopause (post-menopause stage; Gatenby & Simpson, 2024; Richard-Davis et al., 2022). Indeed, previous research has documented that changes in menstruation and less frequent menstrual cycles (perimenopause) may be experienced up to 7 years before menopause, and post-menopausal symptoms may last up to 15 years after menopause (Gatenby & Simpson, 2024; Richard-Davis et al., 2022). Considering the average age of menopause and the potential length of the menopause transition (including perimenopause, menopause, and post-menopause), we included respondents 40 years and older at baseline (i.e., in MIDUS 2), and used longitudinal panel data from both MIDUS 2 and 3 studies spaced over 9 years to capture a more complete picture of the menopause experience.

As with all longitudinal studies, the current study faced challenges of data attrition. Specifically, participants were not included in the current sample, if they 1) only participated in the original and first MIDUS 1 study, but did not participate again in either the MIDUS 2 and/or 3 studies (n = 2,144), or 2) did not complete MIDUS 2 or MIDUS 3 data collection and/or were younger than 40 years of age or older at MIDUS 2 (n = 1,002). To minimize any bias associated with attrition as well as any other expected or unexpected explanations for missingness, we only included individuals who provided responses for at least 80% of the sexual self-efficacy items in MIDUS 2 and were also followed up in MIDUS 3 (n = 958). While the entire current sample was used to examine Hypotheses 1 and 2, Hypothesis 3 and the last exploratory research question were examined with a subsample of only women who reported on menopausal status (n = 483).

Measures and Procedure

The Outcome – Sexual Self-Efficacy

Prior studies suggested that the construct of sexual self-efficacy had multiple dimensions. Based on individuals' retrospective perceptions, these dimensions include sexual control, satisfaction, expectations, and experience (Batmaz & Çelik, 2022; Kennett et al., 2009). We examined five items measured in both MIDUS 2 and 3 studies (Cronbach's α was .83 and .84, respectively). Items included the five questions: *"How would*

you rate the sexual aspect of your life these days?," "Looking back ten years ago, how would you rate the sexual aspect of your life at that time?," "Looking ahead ten years into the future, what do you expect the sexual aspect of your life will be like at that time?," "How would you rate the amount of control you have over the sexual aspect of your life these days?" and "How much effort do you put into the sexual aspect of your life these days?" which were rated on an 11-point Likert scale. Participants were prompted to respond using a scale from 0 to 10, where 0 means "*the worst possible situation*" or "*no control/effort*" and 10 means "*the best possible situation*" or "*very much control/effort*." We coded a mean score such that higher scores suggested higher levels of sexual self-efficacy.

Each of these items were included in the original MIDUS data collection as part of the marriage and close relationships section of the questionnaire. However, researchers intentionally selected these five items to examine in this study as a novel construct measurement for sexual self-efficacy in adulthood. We conducted exploratory factor analysis (EFA) based on the baseline (MIDUS 2) data to examine the construct validity. Findings from the EFA analysis suggested that all items loaded well onto a single factor of sexual self-efficacy $\chi^2(5) = 36.42$, $p < .001$. A parallel analysis scree plot verified that eigenvalues <1 were observed for two or more factors; thus, a single factor of sexual self-efficacy was retained (Cattell, 1966; Kaiser, 1960). Item loadings ranged from .426 (previous outlook) to .908 (current outlook). Therefore, all items met the item inclusion cut off of > .40 (Howard, 2016). Further, we conducted confirmatory factor analysis (CFA) of the MIDUS 2 and MIDUS 3 data separately to further validate the construct with our current sample. CFA factor loadings for MIDUS 2 can be seen in Figure 1. Utilizing a single-factor model of sexual self-efficacy, the CFA demonstrated good model fit in MIDUS 2 (χ^2 (10) = 8449.16, $p < .001$; RMSEA = .08 (90% CI = .06, .11); CFI = .99; TLI = .98; SRMR = .02). Similarly, good model fit was also shown in MIDUS 3 (χ^2 (10) = 10833.42, $p < .001$; RMSEA = .06 (90% CI = .04, .09); CFI = .97; TLI = .94; SRMR = .03).

The Time Indicator

We were particularly interested in observing trajectories and changes over time and created a time variable in combination with other time-varying measures in the analyses (time = 0 for MIDUS 2 data, and 1 for MIDUS 3 data).

The Moderators

We examined two moderators in the hypothesized analyses: menopause transitions, which was time-varying, and marital transition ("*consistently married*" was coded as the reference group), which was time-invariant. Both were uniquely constructed variables for the current study. Menopausal status was assessed at baseline (MIDUS 2) and at follow up (MIDUS 3) using four self-reported indicators of frequency of menstruation, including *"What was the year of your last menstrual period?"* (open response), *"Have you had a menstrual period in the last 12 months?"* (yes, the full year; yes, part of the year; and no), *"Have you had a menstrual period in the last 3 months?"* (yes or no), and *"Has the number of days between the start of one menstrual period and the start of your next menstrual period become less predictable?"* (*yes* or *no*).

The responses to these questions were coded into five categories of menstruation status: 1) *premenopausal* (having menstruated in the past 3 months with a predictable cycle, n = 75 at baseline), 2) *early menopausal transition* (had multiple menstrual periods in the past 12 months, but cycle was less predictable, $n = 30$ at baseline), 3) *late menopausal transition* (had a menstrual period in the past 12 months, but not in the past 3 months, $n = 0$ at baseline), 4) *early postmenopausal transition* (no menstrual period in the past 12 months and reported menstrual cessation within the past 5 years, $n = 56$ at baseline) and 5) *late postmenopausal* (reported menstrual cessation more than 5 years before data collection, $n = 322$ at baseline). These menopause statuses were assessed at each time point, which we used to code the time-varying variable on menopause transition. Importantly, while there were no observations in the late menopausal transition status, two-thirds

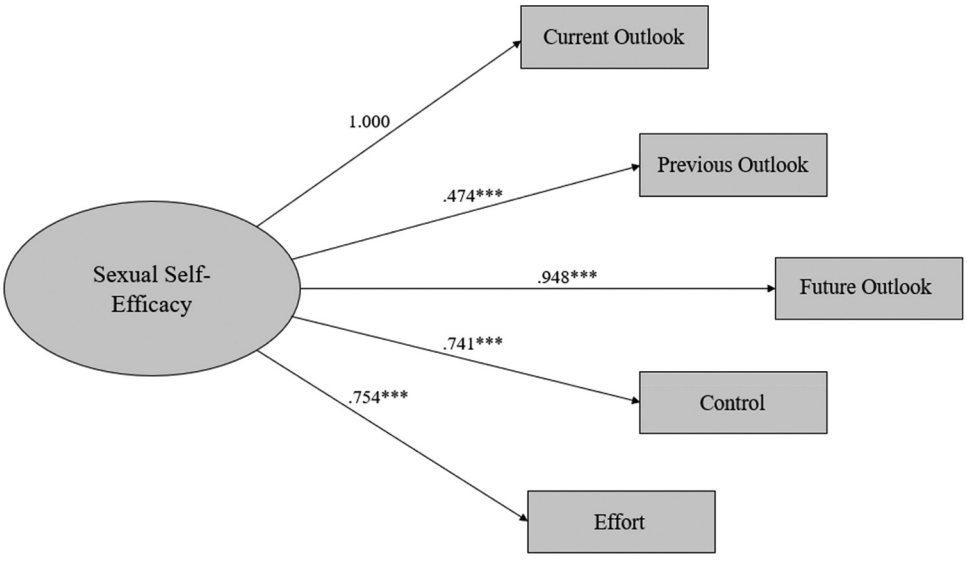

Figure 1. CFA Factor Loadings for Sexual Self-Efficacy at MIDUS 2.

(67%) of the observed menopause transition statuses were late postmenopausal.

Similarly, marital status was assessed at each time point, which we coded into three groups reflecting marital status transition over time. The reference group were those who were continuously married/partnered (reported being married at both MIDUS 2 and 3). The two other groups were those who experienced a marital transition (reported being married at one time point, but not the other) and those who were continuously unpartnered (reported being single at MIDUS 2 and 3).

Covariates

We included factors likely to be associated with sexual self-efficacy as covariates, including age, being female, educational levels, race and ethnicity, religiosity, number of marriages, and time-varying variables on limitations in activities of daily living (ADL) and depressive symptoms. Apart from these two covariates of ADL limitations and depressive symptoms, all the other covariates were time invariant measured at baseline, or at MIDUS 2.

Age was calculated based on individuals' year of birth, and being female was verified in the phone interview and coded as 1 (*male* = 0). Participants self-reported the highest grade of school or year of college they completed. Responses ranged from 1 (*No school/some grade school* which was quantified as 1–6 years of schooling) to 12 (*Ph.D., Ed.D., MD, DDS, LLB, LLD, JD, or other professional degree*), and were coded, with higher values suggesting higher levels of education.

Race and ethnicity were coded as a binary indicator of being White (= 0) or non-White (= 1) if respondents reported being Black or African American, Native American or Alaska Native Aleutian Islander/Eskimo, Asian, Native Hawaiian or Pacific Islander, or anything other than being White. This grouping decision was based on the predominantly White sample (over 91%) in the MIDUS studies, resulting in insufficient cell sizes for detection of meaningful differences by other racial and ethnic categories. Religiousness was assessed in MIDUS 2 based on seven items (Cronbach's α = .90) on the extent of religious identification. Example items included "*How religious are you?*," "*How important is religion in your life?*," and "*How closely do you identify with being a member of your religious group?*." The original response scale ranged from 1 (*Very*) to 4 (*Not at all*) for each of the six items. We coded a sum score ranging from 7 to 28, with higher scores suggesting higher levels of religiousness. Respondents also self-reported number of marriages in MIDUS 2.

ADL limitations and depressive symptoms were likely to change as individuals aged, so we coded each of them as a time-varying covariate. The ADL limitations were assessed based on six items on "*How much does your health limit you in doing each of the following*," including "*lifting or carrying groceries*," "*climbing several flights of stairs*," and "*walking more than a mile*." The original response ranged from 1 (*a lot*) to 4 (*Not at all*) for each of the six items. We coded the variable at each time point by calculating the mean of all the reverse-coded values of the items, with higher scores reflecting greater limitations in performing each activity. Finally, depressive symptoms were assessed based on seven items which asked "*During two weeks in the past 12 months, when you felt sad, blue, or depressed, did you . . .*," "*lose interest in most things*?," "*feel more tired out or low on energy than is usual*?," and "*feel down on yourself, no good, or worthless*?" (Kessler et al., 2004). The original response was binary (1 = *yes* and 0 = *no*). We coded depressive symptoms by taking the total sum of "*yes*" responses to the items, and the variable ranged from 0 to 7, with higher scores suggesting greater depressive symptoms at each time point.

Data Analysis

We used R studio, an open-source software, to clean the data and construct variables (R Core Team, 2021). We then used SAS Proc Mixed to conduct all analyses and the Full Maximum Likelihood Estimation (FIML) to account for missingness. All time invariant and time-varying variables were centered to the sample mean and person mean, respectively. To examine *H1* on sexual self-efficacy trajectory over time, we conducted a growth curve analysis with the entire sample using time as the key predictor (*Model 1*). To examine *H2* on the effect of marital transition on sexual self-efficacy trajectory, we conducted a moderation analysis by expanding *Model 1*. Specifically, we added the interaction term *time* × *marital transition* in addition to the main effects of time and marital transition variables (*Model 2*).

Next, we examined *H3* on the effect of menopause transition on levels and trajectory of sexual self-efficacy over time among women only. Specifically, based on the female sample, we tested the main effects of time and menopause transition variables, and the moderating effect of *time* × *menopausal transition* in *Model 3*. Lastly, we explored the compounding effects of menopause and marital transition on levels and trajectory of sexual self-efficacy over time among women. Specifically, we expanded *Model 3* by adding the 3-way interaction term *time* × *menopausal transition* × *marital transition* and all the 2-way interactions between each of the three variables (*Model 4*).

Results

Sample characteristics are presented in Table 1. To summarize, the sample mean age was 57.44 years and ranged from 40 to 84 years old at baseline (in MIDUS 2). The sample was predominantly White (90.72%), had on average 3 or more years of college education ($M = 7.41$, $SD = 2.5$), and about 65% described being currently employed. Just over half of the sample identified as women (54%). Men and women in the sample were compared to observe any significant differences by gender in demographic variables. Results showed that men had significantly higher levels of education ($t(1000) = 3.66$, $p < .001$). Women demonstrated significantly higher levels of religiosity ($t(1000) = -5.31$, $p < .001$), limitations in ADL ($t(1000) = -5.97$, $p < .001$), and more depressive symptoms ($t(1000) = -4.67$, $p < .001$). See Table 1 for details on demographic factors by gender.

Table 1. Sample characteristics and comparison at baseline (MIDUS 2).

	Entire Sample (n = 1002)	Men (n = 464)	Women (n = 538)	
	Mean (SD) or Freq (%)	Mean (SD) or Freq (%)	Mean (SD) or Freq (%)	t-test or χ^2 sig.
Age	57.4 (10.2)	57.6 (10.2)	57.3 (10.2)	.74
Levels of education	7.4 (2.5)	7.7 (2.6)	7.1 (2.5)	<.001***
Employment status				.73
Employed	651 (65%)	322 (69%)	329 (61%)	
Unemployed	23 (2%)	9 (2%)	14 (3%)	
Retired/Voluntarily	308 (31%)	124 (27%)	184 (34%)	
Race/Ethnicity				.27
White	909 (91%)	426 (92%)	483 (90%)	
Non-white	93 (9%)	38 (8%)	55 (10%)	
Religiousness	19.5 (5.7)	18.5 (5.7)	20.4 (5.6)	<.001***
Number of marriages	1.4 (0.7)	1.4 (0.6)	1.4 (0.8)	.41
Marital transition				<.001***
Continuously married	604 (60.1)	322 (69.6)	282 (52.5)	
Continuously un-partnered	272 (27.2)	92 (19.9)	180 (33.5)	
Had marital transition	124 (12.4)	49 (10.6)	75 (14.0)	
ADL limitations	1.7 (0.8)	1.6 (0.7)	1.9 (0.9)	<.001***
Depressive symptoms	0.5 (1.7)	0.3 (1.2)	0.8 (2.0)	<.001***
Sexual self-efficacy	5.6 (2.3)	5.9 (2.1)	5.4 (2.4)	<.001***
Menopause transition status				
Premenopausal	–	–	75 (15.5)	–
Early menopausal transition	–	–	30 (6.2)	–
Early postmenopausal transition	–	–	56 (11.6)	–
Late postmenopausal	–	–	322 (66.7)	–

Notes. *** $p < .001$.

Religiousness was coded as the sum of seven indicators, with higher scores suggesting higher levels of religiousness.

Premenopausal was defined as having menstruated in the past 3 months with a predictable cycle. Early menopausal transition was defined as having multiple menstrual periods in the past 12 months, but cycle was less predictable. Early postmenopausal transition was defined as having no menstrual period in the past 12 months and reported menstrual cessation within the past 5 years. Late postmenopausal was defined as self-reported menstrual cessation more than 5 years before data collection.

Findings based on the entire sample from *Model 1* suggested that sexual self-efficacy declined for all participants while controlling for covariates ($\beta = -0.760$, $SE = 0.097$, $p < .0001$); thus, *H1* was supported. As hypothesized, findings from *Model 1* also suggested that women had lower overall levels of sexual self-efficacy than men ($\beta = -0.479$, $SE = 0.165$, $p = .004$). The trajectories for men and women are shown in Figure 2. Next, findings based on the entire sample from *Model 2* suggested that *H2* was partially supported. Specifically, compared with those who were consistently married, participants who were consistently unpartnered had lower levels of sexual self-efficacy ($\beta = -0.607$, $SE = 0.248$, $p = .015$); however, the declining slope was similar for all participants rather than different, as we originally expected.

Further, findings based on only women who reported menopausal status from *Model 3* suggested that sexual self-efficacy trajectories changed in ways different from what was originally hypothesized (*H3)*. After controlling for covariates, the overall levels of sexual self-efficacy were actually similar among women across menopause transitions ($\beta = 0.081$, $SE = 0.103$, $p = .435$). Additionally, *Model 3* also suggested that the rate of change for sexual self-efficacy differed depending on menopause transitions over time ($\beta = -0.399$, $SE = 0.201$, $p = .049$; Figure 3). Specifically, as illustrated in Figure 3, older women who stayed as late postmenopausal (i.e., represented by the solid line) seemed to experience steeper declines in sexual self-efficacy over time compared with those who were transitioning from pre- to late postmenopausal (i.e., represented by the dotted line). In contrast, younger women who stayed as premenopausal seemed to have increasing sexual self-efficacy over time. Lastly, findings from *Model 4* suggested that there were no significant 2-way or 3-way interactions between the main effects of time, menopause transition, and marital transition. Therefore, the menopause transition and relationship transition did not interact or have any compounding impact on sexual self-efficacy over time. For further information on analyses for all models, please refer to Table 2.

Discussion

The current study is one of the first to examine sexual self-efficacy among mid-aged and older adults, a subject that is seldom studied in aging populations. Findings confirmed declining trajectories that are consistent with previous research (Karraker et al., 2011), and suggested novel patterns of complex interactions between aging, marital status and transition, and menopause transition.

While the rate of decline was comparable for both men and women, women reported significantly lower levels of sexual self-efficacy compared to men, suggesting that experiences of sexual self-efficacy were influenced by sex and gender. Societal norms regarding sexuality and aging, specifically the cultural emphasis on youth and sexual attractiveness, can undermine the sexual self-concept of older adults (Marano et al., 2025; Towler et al., 2023). When we utilize a feminist lens, however, the lower overall levels of sexual self-efficacy for women might be explained due to one's perception of their sexual ability being influenced by social

Table 2. Parameter estimates from hypothesized models.

	Model 1			Model 2			Model 3			Model 4		
Fixed Effect	Est	SE	*p*-value	Est	SE	*p*-value	Est	SE	*p*-value	Est	SE	*p*-value
Intercept	9.306	0.615	<.0001***	9.292	0.613	<.0001***	8.615	.998	<.0001***	8.428	1.056	<.0001***
time	−0.760	0.097	<.0001***	−0.791	0.115	<.0001***	1.168	0.963	.226	0.721	1.008	0.475
TV menopause transition (MT)							0.081	0.103	.435	0.031	0.124	0.803
Relationship transitions (RT)				−0.235	0.288	.413				−2.271	1.192	0.057
Consistently unpartnered (CU)				−0.607	0.248	.015*				−0.274	0.965	0.776
Time × MT							−0.399	0.201	.049*	−0.299	0.218	0.171
Time × RT				0.300	0.290	.301				4.591	5.146	0.373
Time × CU				−0.025	0.243	.918				4.432	4.708	0.347
MT × RT										0.427	0.274	0.121
MT × CU										−0.125	0.215	0.562
Time × MT × RT										−1.015	1.057	0.338
Time × MT × CU										−0.858	0.959	0.372
Age	−0.057	0.008	<.0001***	−0.053	0.008	<.0001***	−0.063	0.016	<.0001***	−0.048	0.017	0.006**
Female	−0.479	0.165	.004**	−0.364	0.170	.033*						
Education	0.066	0.051	.191	0.063	0.050	.213	0.124	0.079	.118	0.131	0.079	0.098
Nonwhite	0.438	0.339	.197	0.561	0.341	.101	1.348	0.531	.012*	1.658	0.541	0.002**
Religiousness	0.019	0.014	.195	0.012	0.015	.410	0.030	0.023	.184	0.025	0.023	0.284
Number of marriages	0.133	0.102	.194	0.127	0.102	.214	0.047	0.131	.718	0.042	0.130	0.748
TV ADL limitations	−0.455	0.084	<.0001***	−0.455	0.084	<.0001***	−0.568	0.128	<.0001***	−0.613	0.129	<.0001***
TV depressive symptoms	−0.040	0.042	.334	−0.037	0.042	.370	−0.087	0.059	.143	−0.075	0.060	0.213
Random Effects												
Intercept variance	2.432	0.232	<.0001***	2.388	0.230	<.0001***	2.564	0.401	<.0001***	2.464	0.399	<.0001***
Residual	2.438	0.147	<.0001***	2.443	0.148	<.0001***	2.847	0.287	<.0001***	2.870	0.293	<.0001***
Model												
Model Fit												
−2 Log-likelihood	4903.4			4897.9			2122.9			2109.8		
AIC, BIC	4907.4, 4916.1			4901.9, 4910.6			2126.9, 2134.3			2113.8, 2121.2		

Notes. * $p < .05$. ** $p < .01$. *** $p < .001$.
Est = Parameter estimates, SE = standard error, AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, TV = Time-varying.
Models 1–2 were conducted on the entire sample; Models 3–4 were conducted on the female sample.
Within-person predictors used individual observations centered on the person mean; between-person predictors used the person mean centered on the sample mean.

constructs and expectations of gendered performances, which include sexual interactions (Allen, 2022). Indeed, previous research supports the idea that adherence to traditional gendered sexual scripts is detrimental for women, negatively impacting sexual function and psychological well-being (Scappini & Fioravanti, 2022; Ward et al., 2022). These effects may be exacerbated for women due to social pressures that emphasize physical appearance and reproductive capabilities as sexual values (Allen, 2022). Further, sexual expression is negatively impacted by stress levels (Delcea & Scaunas, 2022; Masoudi et al., 2022). Women in midlife often carry a disproportionately large share of caregiving responsibilities, which can be associated with high stress levels (Bangerter et al., 2018; Rowllings et al., 2025). Such caregiving load and high stress influence sexual self-efficacy for women in midlife and should be further examined in future studies.

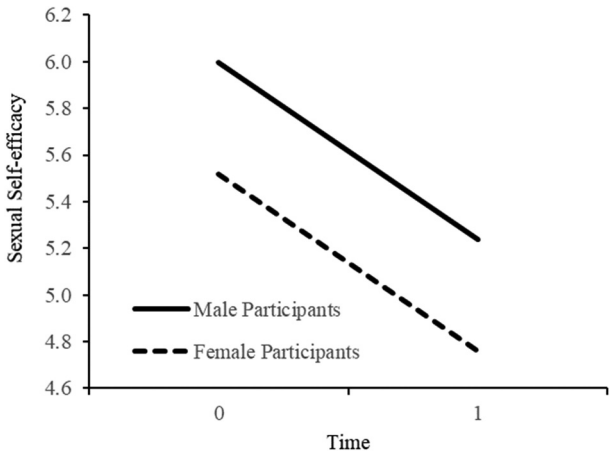

Figure 2. Trajectories of Sexual Self-Efficacy Over Time by Gender.

When examining the moderating effect of marital transitions on the trajectory of sexual self-efficacy, we found that those who were consistently married had significantly higher levels of sexual self-efficacy than those who were consistently unpartnered. This difference in context of relationship status was expected, as sexual relationships provide greater opportunities to construct sexual meanings through social and relational interactions (Byers, 2005; Gabb, 2022; LaRossa & Reitzes, 1993). Considering this, we expected to see a comparatively steeper decline in sexual self-efficacy for those who were consistently unpartnered. We also anticipated a significant difference between those who experienced a marital transition and those who did not. However, our findings did not support these expectations. Instead, we found similar rates of decline in sexual self-efficacy for all participants, regardless of relationship context. Further, there was no significant difference in levels of sexual self-efficacy between those who experienced a marital transition compared to those who reported consistent relationship statuses between waves. These findings suggest that marital transition did not necessarily alter the trajectory of sexual self-efficacy for older adults, though a marriage does seem to be associated with higher sexual self-efficacy levels. Previous literature has

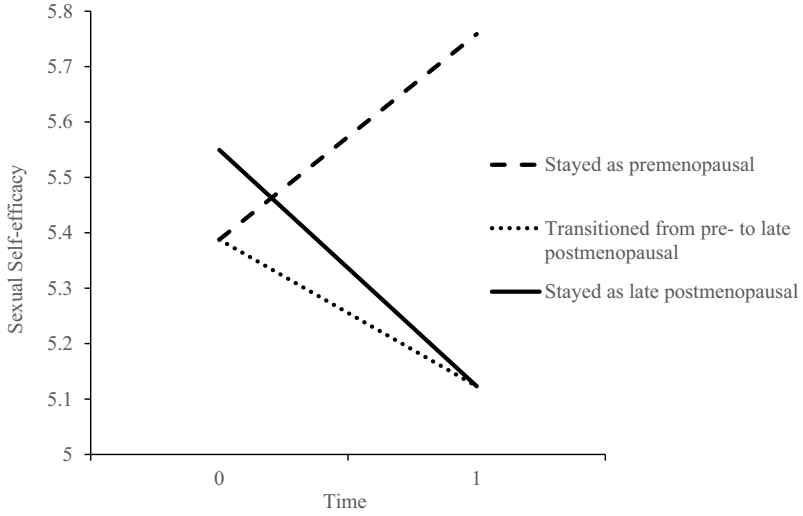

Figure 3. Trajectories of Sexual Self-Efficacy Over Time by Menopausal Transition.

suggested that contexts of marriage provide greater opportunity for sexual intimacy as well as opportunities to challenge traditional gendered sexual scripts (Gore-Gorszewska, 2021; Stokes et al., 2020).

Employing a symbolic interactionist lens to these findings, it may be that a marriage provides more frequent interactions with sexual scripts as well as greater opportunities for social validation and intimacy within these interactions (Byers, 2005; Ji & Yan, 2022; LaRossa & Reitzes, 1993). In contrast, our findings suggested that the rate of decline was similar regardless of relationship status; thus, internal interactions with symbols of sexuality on an individual basis may be a better indicator of sexual self-efficacy trajectory changes than marital status (Hashemiparast et al., 2024; LaRossa & Reitzes, 1993; von Humboldt et al., 2021). The rather unexpected findings provided insight into ways that marital relationship contexts impact levels of sexual self-efficacy for aging individuals and offer openings for future research inquiries.

Regarding menopause transitions, the findings suggested that the overall levels of sexual self-efficacy were different for women across menopause transitions. Importantly, the menopause transition alone did not significantly alter overall levels of sexual self-efficacy over time. However, the rate of change differed for women who were experiencing varying menopausal stages. These findings contrasted with what we had originally expected, as previous research demonstrated that women adapt to the sexual impacts of menopause (Bulut et al., 2024; Refaei et al., 2022). Indeed, we expected that those in late post-menopause would have lower but more stable trajectories of sexual self-efficacy due to having had more time to adjust to sexual impacts of menopause, while accounting for covariates such as ADL limitations. However, findings indicated that women who were in late post-menopause experienced the steepest decline in sexual self-efficacy over time but their overall levels were comparable to others. Similarly, women who experienced a menopausal transition over the course of the study also demonstrated a decline in sexual self-efficacy. This decline during menopause transition was expected, considering the robust literature on negative experiences of menopause and increased sexual dysfunction during the transition (Athey et al., 2021; Graziottin & Leiblum, 2005). In contrast, women who stayed as premenopausal over time demonstrated an increase in sexual self-efficacy. The increasing sexual self-efficacy of premenopausal women in the study might have reflected the fact that they were younger, while the predominant majority of women were late post-menopausal in this MIDUS sample. This unique trajectory pattern should be further examined.

Overall, our findings seem to suggest that factors such as race and physical ability may better explain variations in sexual self-efficacy beyond menopause. Additionally, varying menopause transition stages seem to have a greater impact on the rate of change in sexual self-efficacy rather than its overall levels over time. Extant literature indicate many negative symptoms associated with menopausal changes (Athey et al., 2021; Bagga et al., 2024; Graziottin & Leiblum, 2005) and ways that women adapt to these changes over time (Bulut et al., 2024; Refaei et al., 2022). Accounting for demographic variables and other covariates may help to explain nuances in sexual self-efficacy trajectories beyond menopausal symptoms alone. Indeed, previous research has shown that education and race influence sexual self-efficacy for young adults (Edison et al., 2022; Goldfarb & Lieberman, 2021). Further, literature supports that aging and declines in physical ability impact relationships and self-perception (Kim et al., 2021; Tully-Wilson et al., 2021). Although a robust body of study indicates that menopausal symptoms can disrupt sexual expression (Athey et al., 2021; Bagga et al., 2024; Graziottin & Leiblum, 2005) and that women are resilient and adapt to these changes (Bulut et al., 2024; Refaei et al., 2022), findings from the current study suggested that sexual self-efficacy continues to be impacted over time from a within-person perspective, a unique findings from the longitudinal data and design.

Importantly, this study provides insight that the timing of menopause and social influences of gender differences impact level and trajectories of sexual self-efficacy. Specifically, feminist and symbolic interactionist perspectives support this interpretation, assuming gender is constructed through social

interactions, and not solely determined by biological indicators (Allen, 2022; LaRossa & Reitzes, 1993). Previous research demonstrates adaptation to negative menopause symptoms and differential sexual functioning (Bulut et al., 2024; Refaei et al., 2022). Sexual self-efficacy is not adequately represented by sexual function alone, and psychosocial factors likely contribute to the impact of menopausal timing on sexual self-efficacy as well. As women age, the impact of menopause on sexual self-efficacy may be overshadowed by broader societal narratives about aging and caregiving demands. Indeed, a study by Kim et al. (2021) found that women's positive self-perceptions of aging were negatively associated with increases in functional limitations, while men did not demonstrate this pattern. Rowllings et al. (2025) also documented that women balancing menopause and caregiving in mid-life reported greater stress and reduced work hours compared to their male peers. Further, findings from this study support symbolic interactionism's view that sexual self-efficacy is shaped by ongoing interactions. Previous studies by Gore-Gorszewska (2021), Scheinkman et al. (2022), and Towler et al. (2023) explored how older adults' experiences of sexual satisfaction shift from narratives of sexual intercourse to narratives of expansive sexuality and specifically emotional intimacy. These studies highlight how meanings of sexuality shift with time and interactions with aging, intimacy, and sexuality, suggesting that sexual self-efficacy narratives likely also change with similar interactions.

Finally, this study found no significant interaction between menopause transitions and marital status transitions, further underscoring the complexity of understanding sexual self-efficacy in middle aged and older adults. Specifically, these results suggested that the combined effects of menopause and marital transitions did not compound the decline in sexual self-efficacy. This finding is not surprising, considering that marital transitions and menopause transitions only significantly impacted either overall levels or trajectories of sexual self-efficacy over time, but not both. However, this may challenge traditional gendered expectations regarding menopause and marriage imposed on women, which would suggest a compounded effect on women's sexuality in mid-age and late life (Allen, 2022; Crema & De Tilio, 2021; Pickard, 2022). Thus, it is likely that women's sexual self-efficacy is shaped by a multitude of factors, not just specific relationship or biological transition factors. Importantly, the roles of sexual self-concept, cultural narratives, and perceptions of sexual satisfaction may be fruitful next steps in understanding sexual self-efficacy development for older women.

Limitations and Future Directions

While providing novel insight, this study also had important limitations that should be considered when interpreting findings. Specifically, the datasets were limited to have only two time points of observations, and only linear trends could be modeled. All measures were self-reported measures, and effects of social desirability should be considered when interpreting results. Additionally, the data sets only offered a binary gender measure, preventing the application of these results for gender expansive individuals. Future research should address how sexual self-efficacy is experienced by those assigned female at birth who identify as another gender, as existing research highlights that puberty and menopause can be particularly distressing and taxing for gender expansive individuals (Toze & Westwood, 2025).

Additionally, relationship status was restricted by the construct of legal marriage, specifically focusing on the status of marriage across time. This does not account for other forms of relationship transitions, such as cohabitation and committed partnerships outside of institutional marriage. As the measures were taken nearly a decade apart, it is highly likely that we did not capture all forms of marital transitions. For example, we were not able to determine if a marriage at baseline was the same marriage at time two or if those who indicated being unpartnered at both time points had been partnered at any time between measurements. Considering this, we should use caution in interpreting marital transitions. Future research could include shorter measurement intervals and more comprehensive marital transition survey items. Further, we did not have sufficient statistical power in this study to address marital transition differences in entering a marriage compared to leaving a marriage over the course of the study. We acknowledge that the directionality of a marital transition likely has a great impact on sexual self-efficacy, and we encourage future research with primary data collection to examine the trajectories of differing marital transitions.

The sample was predominantly White, and was not racially or ethnically representative of any other population. Future research must utilize a more diverse sample, as impacts of marital transitions and sexual self-efficacy can be greatly influenced by culture (Allen, 2022; Scappini & Fioravanti, 2022; Ward et al., 2022). Further, the majority of the female sample was late menopausal in the current study, and did not experience menopausal transition during the time period studied. Thus, we were unable to compare transition stages due to lack of statistical power. Previous research indicates that each woman experiences menopause differently and future research into nuanced experiences of menopause are warranted (Gatenby & Simpson, 2024; Richard-Davis et al., 2022; Strauss, 2013). A more comprehensive understanding of all experiences of menopause and marital transitions would be beneficial to the field as a whole, and researchers should prioritize this in future endeavors.

Conclusion

In conclusion, while the results of the present study confirmed established patterns, such as a decline in sexual self-efficacy with age, the findings also pointed to the importance of broader social contexts when examining sexual self-efficacy among middle-aged and older adults. The observed decline in sexual self-efficacy over time may not only be influenced by age and physical decline; societal narratives of gender, the aging process, and sexuality also seemed to play a role. Feminist and symbolic interactionist perspectives provided insight into how these findings can be interpreted, as sexual self-efficacy is constantly being developed through social interactions and the broader cultural context. Future research

should explore other factors contributing to sexual self-efficacy in mid-age and late life which were not examined here, such as sexual self-concept, sexual communication, and perceptions of emotional intimacy.

Disclosure Statement

The authors declare that they have no other competing financial interests or personal relationships that could have appeared to influence the work reported in the current paper.

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