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Long-Term Trajectories of Marital Adjustment in Israeli Couples Over Decades: Does Gender Matter?

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Abstract
This study explored trajectories of marital adjustment, including overall, affection, satisfaction, cohesion and consensus, in 197 middle-aged Israeli spouses who had been married for an average of 34 years. As military conscription in Israel is mandatory, all men in this study are military veterans. The main aims of the study were to explore the trajectories of marital adjustment over time and to describe similarities and differences in the marital adjustment of husbands and wives. Assessments were done at three time points over 12 years and were analyzed using a latent growth mixture model. Findings showed that overall husbands and wives reported being generally satisfied in their marriage. Different trajectories for husbands and wives were found in most domains of marital adjustment. The majority of wives reported a sharper decline in satisfaction over time, while more husbands reported an increase in affection. The wives reported more variability, as well as higher levels of consensus than their husbands across the 12 years of the study and the three data collection points. The spouses' high level of cohesion served to support their high levels of marital adjustment. Implications of these findings are discussed.

Keywords Marital adjustment · Gender · Trajectory · Dyadic adjustment scale

The experience of each partner within his or her long-term marital relationships has been of interest to developmental and family scholars for many years (e.g. Fowers 1991; Vanlaningham et al. 2001). Marriage is widely considered to be dynamic and ever changing, with each partner possibly experiencing variations in marital adjustment throughout the duration of the relationship (Anderson et al. 2010; Birditt et al. 2012).

For the purpose of this study, marital adjustment is defined as, "a process, the outcome of which is determined by the degree of troublesome dyadic differences, interpersonal tensions and personal anxiety, dyadic satisfaction and cohesion, and consensus on matters of importance to dyadic functioning" (Spanier 1976, p. 17). Marital adjustment is multi-dimensional and comprised of various aspects, including affection, satisfaction, consensus, and cohesion (Spanier 1976). Affection relates to how often the partners express their love to each other; satisfaction refers to the levels of conflict and happiness experienced by each partner in the relationship; consensus comprises the couple's level of agreement on specific important issues, such as financial management or other important life decisions; and cohesion relates to the levels of collaborative activities within the couple (Zargar 2014). It has been consistently documented that marital adjustment has a significant impact on well-being, as couples in stable or positive relationships reported better mental and physical health and higher levels of happiness (Waite and Gallagher, 2000; Miller et al. 2013; Gustavson et al. 2016). On the other hand, long-term yet low-quality marriages have been found to have a negative effect on an individual's well-being (Hawkins and Booth 2005).

Many existing studies of marriage have surveyed couples in the early years of their marriage, typically when participants have been in their 20s or 30s. The current study took a

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different approach by examining older Israeli couples who were middle-aged at the start of the data collection. As military conscription in Israel is mandatory (Avidor et al. 2016), with combat positions largely filled by males (Blum 2016), all men in this study are military veterans. Additionally, middle-aged Israeli couples have been found to maintain traditional gender roles (Kulik 2004). Both the husbands and the wives were followed as they aged, to gain insight into how the long-term trajectories of marital adjustment of husbands and wives developed over time. As lifespans increase and couples potentially remain in marriages for longer than ever before, it is increasingly important to examine marital adjustment at older ages.

Longitudinal Studies of Marital Adjustment

Marital adjustment fluctuates and changes over time (Dush and Taylor 2008; Birditt et al. 2012). In the few existing longitudinal studies of marriage that have spanned multiple decades, researchers have come to consider marriage as consisting of different trajectories as well as having distinct and steady interpersonal dynamics. For example, The Marital Instability over the Life Course study examined 2033 married individuals between the ages of 18–55 over a 20-year period, collecting information at six time points. Five distinct trajectories of marital adjustment were found. Nearly two-thirds of the respondents reported high and stable levels of happiness over time, while the remaining one-third demonstrated either a pattern of continuous low happiness, low happiness that subsequently declined, or a curvilinear pattern of high happiness, decline, and recovery (Anderson et al. 2010). In another study of 251 newlywed couples over the first 4 years of marriage, three distinct marital trajectories of high, moderate, and low levels of adjustment were found (Lavner and Bradbury 2012). A recently published meta-analysis of fourteen studies that examined trajectories of marital adjustment introduced the "honeymoon-as-ceiling-effect" due to the consistent finding that couples who began their marriage with high-marital quality were likely to remain stable or experience minimal decline, whereas those who started with lower satisfaction were more likely to experience poor marital quality and possibly divorce (Proulx et al. 2017). The "honeymoon-as-ceiling-effect" posits that spouses established a baseline of satisfaction early in their relationship and over time they did not significantly improve on the positive dimensions of marital quality; even those who experienced a dip in satisfaction and a later rebound did not exceed the initial levels of satisfaction (Proulx et al. 2017). The findings of this paper are in contrast to the previous theory of "honeymoon-is-over effect", which suggested that high levels of relationship quality after the marriage typically decline (Kurdek 1998; Proulx et al. 2017). While previous studies of long-term marriage have examined overall marital adjustment, the subdomains of adjustment have not been explored longitudinally. Therefore, this study is unique in its exploration of these subdomains in long-term marriages to gain insight into the facets and nuances that play a role in overall adjustment, rather than examining the construct as homogenous.

Aging and Marital Adjustment

As each stage of development presents its own benefits and challenges (Erikson 1997), the question arises as to how older couples assess their marital adjustment in the later stages of life. Young couples are confronted with different challenges than couples who have been married for several decades, such as starting and raising a family, financial difficulties, and a higher risk of divorce (Kurdek 1999). Older couples are faced with other unique milestones, such as failing health, children leaving the home, as well as the death and illness of their parents and friends (Hoppmann and Gerstorf 2009; Polenick et al. 2017).

At the same time, age may also be positively associated with marital adjustment, perhaps due to standards of partners relaxing over the years or spouses becoming more appreciative of their partner's positive traits (Umberson et al. 2005). The couple may also be less emotionally negative in their resolution of conflict and may have developed effective coping strategies for dealing with challenges (Carstensen et al. 1995; Landis et al. 2013). After living together for decades, spouses can come to display similarities, such as in how each partner ages. Long-married couples may also have similarities between spouses in terms of their well-being (Bookwala and Jacobs 2004), as well as their emotional (Townsend et al. 2001), and physical health (Haase et al. 2016). Indeed, marital satisfaction has been found to serve as an important discriminator of successful aging (Ko et al. 2007). Finally, marriages of poorer quality may have ended in divorce earlier on, resulting in the remaining long-term marriages being of higher quality (Glenn 1990).

Given these previous findings on marriage, this study aims to examine marital adjustment in light of the socioemotional selectivity theory (SST), which is a lifespan theory of social motivation (Carstensen 1993). According to the SST, the perception of time has a key role in an individual's prioritization of social goals as well as choices and preferences for social partners. As adults age and understand that their time is limited, they focus on more important and satisfying interpersonal ties and relationships as a way to prioritize satisfying emotional interactions with others (Levenson et al. 1993; Carstensen et al. 1999). Therefore, it is possible that as one ages, those who find their marriages fulfulling will opt to spend more time with a spouse, which may result in

increasing marital adjustment. Alternatively, those who do not find their marriages meaningful might choose to leave or disengage from their relationship, which would be reflected in decreasing marital adjustment. Therefore, according to the SST, diverging trajectories of marital adjustment may be expected as individuals age.

Gender Differences in Marital Adjustment

Studies of long-term marriages have found differences between the genders regarding marital adjustment. In general, wives have overall been found to be less satisfied than their husbands (e.g., Shek 1995; Jackson et al. 2014). Wives have also reported to be more likely to downregulate their negative emotions, a behavior that has been found to be predictive of greater marital satisfaction (Bloch et al. 2014). However, for couples followed over 40 years, wives—but not husbands—reported that they had come to find it more difficult to resolve disagreements over time (Vaillant and Vaillant 1993). Yet, of all of the existing studies on gender differences in long-term marriages, to the best of our knowledge none have explored the trajectories of the various aspects of marital adjustment over time in both spouses.

The Current Study

This study contributes to the existing literature by focusing on the development of the different aspects of marital adjustment in long-term marriages for both husbands and wives. It included participants who were middle-aged at the start of data collection, allowing for the examination of couples as they transition to older age. This differs from many of the previous longitudinal studies of marriage, which had begun surveying couples in the early years of their marriage (e.g., Boden et al. 2010). Secondly, both general marital adjustment and the four domains were examined, unlike other previous studies of marriage that had only focused on the overall marital adjustment score. Based on the theoretical assumptions of the SST, we expected that diverging trajectories of marital adjustment would be identified for all four domains of the DAS. We hypothesized that initially high scores in individual domains would further increase as participants enter older age, whereas low scores in domains of dyadic adjustment would decrease. Third, accounting for the possible individuality of developmental patterns of marital adjustment, this study used a data-driven method that allowed the findings to fall into their own patterns, rather than pre-determining expected trajectories or total group mean trajectories (Proulx et al. 2017). Therefore, the two aims of this study were to (1) explore the individual trajectories of marital adjustment—including overall adjustment, affection, satisfaction, cohesion, and consensus—in middle-aged couples, and to assess the changes over time in their marital adjustment later in life; and (2) To descriptively explore similarities and differences between men and women in the dimensions of marital adjustment across the three time points of data collection.

Methods

Participants and Procedure

The current study is part of a multi-cohort longitudinal study of Israeli men who participated in the 1973 Yom Kippur War and their wives. Data were collected from the husbands at four time points: 1991, 2003, 2008, and 2014–15 (for additional information, as well as for details about demographic data, please see Solomon et al. 2012). In the 1991 collection, the husbands were not asked about their marital adjustment. Data were collected from the wives at three time points between 2003, 2010–11, and 2015 (for further details regarding the 2003 and 2010–11 measurements see Greene et al. 2014). The current study focuses on a subset of this larger sample, namely on men and their spouses who participated in the waves of the study in 2003 (T1), 2008 or 2010 (T2), and 2014–15 (T3). Long-term marriage in this study was defined as a period of 10 years or longer (Humbad et al. 2010). Following the Tel Aviv University Review Board's approval, we contacted the husbands and their wives and obtained written informed consent. The questionnaires were administered at the participants' homes or at another location of their choice.

In the original 1991 sample, 520 husbands were contacted and 349 agreed to participate. Marital adjustment was not assessed in this wave. For this reason, the 1991 wave was not included in this study. In the present study, 287 husbands from the original sampling list took part in T1 (51 could not be located or refused to participate, 5 had died, and 6 could no longer participate due to mental deterioration). In T2, we contacted the original sampling list and 289 husbands participated (49 could not be located or refused to participate, 25 had died, and 6 could no longer participate due to mental deterioration; 82 husbands were added from the original sampling list, as we returned to the original sampling list in each wave). At T3, 259 men participated (70 declined to participate, 22 could not be located, 2 didn't return questionnaires, 3 did not participate due to mental deterioration, 2 did not participate due to medical reasons, 6 were abroad, and 48 had died).

Of the 287 men who took part in T1, 213 were married; 156 of their wives participated in T1 (73.2% response rate). Of the 289 men who participated in T2, 250 were married; 172 of their wives participated in T2 (69% response rate).

In T3, 161 wives participated. Participants were included if both men and their wives participated in at least two waves of measurement ($n = 163$), or if the couple overall had at least 4 valid measurements out of six ($n = 34$) (e.g., couples with full data for the husbands and one full valid measurement for the wives but with partial data for one additional measurement). The final sample consisted of 197 dyads (couples with at least two valid measurements each) of which there were partially missing data. Specifically, there were 14–27% missing values, which could not be more than 20% of the items in each questionnaire. If missing values of a participant exceeded 20% at any given measurement point, the participant was deleted from the analysis.

Demographic Data

In T1 husbands were $M = 57.9$ (SD = 5.09) years of age, had $M = 13.9$ (SD = 3.9) years of education; 57.2% were working fulltime, 13.3% had part-time jobs, and 29.5% were not working. In T1 wives were $M = 58.3$ (SD = 5.79) years of age, had $M = 14.6$ (SD = 3.2) years of education; 47.7% were working fulltime, 20.9% had part-time jobs, and 31.4% were not working (for further details see Solomon et al. 2012 and Greene et al. 2014). The couples were married for $M = 34.20$ (SD = 5.79) years. Those married up to 10 years were 1.5% ($n = 3$); 11–20 years, 5.1%, ($n = 10$); 21–30 years, 53.8% ($n = 106$); 31–40 years, 16.8% ($n = 33$); and > 41 years, 1.5% ($n = 3$). Among the husbands, 72.1% ($n = 142$) were in their first marriage. Among the wives, 61.9% ($n = 122$) were in their first marriage. The average number of children was $M = 3.23$ (SD = 3.00). Three couples that were married up to 10 years were removed from the data analysis as this study is focused on long-term marriage (inclusion criteria).

Measures

The Dyadic Adjustment Scale (DAS; Spanier 1976) is a widely used measure of marital quality in the social and behavioral sciences (Graham et al. 2006). The 32-items of the DAS are measured on varying Likert-type response scales and are summed to create a total score ranging from 0 to 151. Higher scores suggest better dyadic adjustment. Four DAS subscales have been distinguished: dyadic consensus (13 items ranged 13–78; Cronbach's $\alpha = .90$), which assesses the degree to which both partners agree on matters of importance in the relationship; dyadic satisfaction (10 items ranged 10–60; Cronbach's $\alpha = .94$), which measures the degree to which the couple is satisfied with their relationship; dyadic cohesion (5 items ranged 5–30; Cronbach's $\alpha = .86$), which assesses the degree of closeness and shared activities experienced by the couple; and dyadic affection (4 items ranged 2–14; Cronbach's $\alpha = 73$), which captures the degree of demonstrations of affection and sexual relationships (Spanier 1976). A meta-analysis of 91 published studies (Graham et al. 2006) including the DAS reproduced acceptable to good reliabilities for the total score and its subscales (Cronbach's $\alpha = .71$–92). Furthermore, the DAS has been shown to have high convergent and discriminant validity (Heyman et al. 1994; Villeneuve et al. 2015) and has been previously used in Israeli populations (e.g., Horesh and Fennig 2000). Husbands and wives were asked to indicate the extent to which each item described their current marital interaction. In the current study, internal consistency of the total score was high among both husbands and wives in T1 (Cronbach's $\alpha = .95$, .96, respectively), T2 (Cronbach's $\alpha = .95$, .95, respectively), and T3 (Cronbach's $\alpha = .90$, .91, respectively).

Handling Missing Values

To diagnose the impact of missing data, Mplus was used, as it provides estimates of covariance coverage for each pair of variables in the analysis. In the present study, covariance coverage for each pair of variables did not fall below 0.4, which is above the minimum threshold of 0.10 for model convergence. In addition, Little's Missing Completely At Random (MCAR) test revealed that the data were not missing completely at random, $\chi^2_{(135)} = 330$, $p < .001$. T tests that compared missing to valid data in all observed variables, marital adjustment and demographics over time, showed that the missingness was related to the observed data. Specifically, husbands and wives that participated in earlier measurement tended to participate in subsequent measurements, compared to husband and wives who were missing. On the other hand, husbands and wives who were missing in subsequent measurement reported older age in the initial measurement, compared to those who had valid data. Finally, husbands who had valid data in the initial measurement reported higher affection and consensus in the last measurement. This pattern supported the not missing at random MCAR pattern, which rendered analyses consisting only of data which was complete, somewhat biased.

Therefore, missing data were replaced with maximum likelihood robust (MLR) estimations when running models in Mplus 8 (Muthén and Muthén 2010). The main cause for using MLR was the non-normal item distributions in the full data set and the bias revealed in the anchored data that included the 197 dyads. Therefore, we used the full information maximum likelihood estimator with non-normal robust standard errors (MLR; Yuan and Bentler 2000; also, Enders 2010).

This method uses all available data for each participant to partially recover missing information from earlier or later measurements. This study utilized data measured for partners and across waves to increase the likelihood for optimal estimations (Collins et al. 2001). The appropriateness of

MLR is widely endorsed (Enders 2001; Schafer and Graham 2002).

Data Analysis

The study's main aim was to explore trajectories over time and to allow subgroups to emerge via an individual-centered approach. This approach refers to the sample as comprising of multiple classes. Specifically, we employed linear and linear + quadratic latent growth mixture model (LGMM) that examines whether multiple growth trajectories exist within a population (e.g., Jung and Wickrama 2008). Each trajectory represents a subgroup (i.e., a latent class) of homogenous individuals who follow approximately the same growth curve over time. The analyses were performed using Mplus (V.8; Muthén and Muthén 2010). We ran models separately for husbands and wives, for total marital adjustment, and its subscales.

As LGMM is flexible in modeling time (Muthén and Muthén 2004), we used factor loadings that corresponded directly to the time intervals (specifically, setting the first measurement point as 0 and the last as 11 for husbands and 12 for wives). In addition to the linear slope, we included a quadratic factor in our latent growth models, thereby enabling detection of curvilinear trajectories in addition to a linear pattern. To avoid multicollinearity between the linear and quadratic slopes, we centered the time points around the mean of the time scores ($M = 5.66$ for husbands and $M = 6.33$ for wives) and set the linear time scores to 5.66, − 0.66, and 6.34 for husbands, and − 6.33, 0.67, and 5.67 for wives (the correlation between the linear and quadratic slopes was 0.95 without centering).

The number of latent classes best fitting our data were determined by the Bayesian Information Criterion (BIC), Akaike Information Criterion (AIC), bootstrapped likelihood ratio test (BLRT), entropy score, and average latent class probabilities of group membership (e.g., Jung and Wickrama 2008). The optimal number of classes was chosen based on: (a) the lowest BIC, sample size-adjusted BIC, and AIC scores; (b) significant BLRT test; and (c) high-latent class membership probabilities, and entropy values approaching 1 (Jung and Wickrama 2008). In addition, we also compared the difference of fit indices between linear and linear + quadratic models and selected the optimal class according to the criteria above.

Beyond model fit indices, theoretical considerations were taken into account when determining the number of classes. We weighted both model fit indices and theoretical considerations. We do know that previous literature may support the decision to add a trajectory that is relatively small (Anderson et al. 2010).

Results

Mean DAS values of the husbands' total score were 107.41 (SD = 23.00), 96.84 (SD = 30.96), and 110.40 (SD = 20.48) for T1, T2, and T3, respectively. Mean DAS values of the wives' total score were 106.03 (SD = 26.76), 102.32 (SD = 26.17), and 120.32 (SD = 23.44) for T1, T2, and T3, respectively. The subfactors of marital adjustment across partners and over time, and paired correlations between partners on all factors in each time point are presented in Tables 1 and 2. Most variables distributed normally or approximately normally (skewness values of − .61 (SD = .20) to − 1.255 (SD = .21) with men's marital adjustment at T3 normally distributed (skewness value of − 2.20 (SD = .21).

Table 1 Descriptive table of participants

	Men	Women	*t*	*P* value	*r*	*P* value
T1 satisfaction	37.45 (7.33)	37.09 (7.44)	0.5	0.6	.49***	0
T1 cohesion	16.04 (4.55)	15.78 (5.68)	0.5	0.6	.45***	0
T1 consensus	47.03 (10.74)	47.21 (11.04)	0.2	0.9	.49***	0
T1 affect	8.29 (2.65)	8.34 (2.69)	0.2	0.8	.35***	0
T2 satisfaction	34.34 (10.03)	34.88 (8.39)	0.6	0.6	.53***	0
T2 cohesion	15.15 (14.27)	14.29 (5.87)	0.7	0.1	.63***	0
T2 consensus	42.50 (13.35)	43.49 (13.12)	0.7	0.5	.48***	0
T2 affect	7.00 (2.89)	6.89 (3.08)	0.3	0.8	.35***	0
T3 satisfaction	34.55 (5.96)	29.74 (8.07)	5.73***	0	0.1	0.2
T3 cohesion	20.25 (3.12)	20.45 (5.78)	0.4	0.7	0.1	0.5
T3 consensus	44.07 (6.41)	59.51 (11.38)	12.71***	0	− .12	0.2
T3 affect	14.85 (2.81)	11.57 (3.23)	8.23***	0	− .10	0.3

***$p < .001$

Table 2 Bivariate correlations between DAS total and subscales over time for husbands and wives

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.T1 Total DAS	–	.86***	.82***	.92***	.79***	.51***	.51***	.51***	.43***	.28**	.59***	.26*	.65***	.58***	.51***
2.T1 satisfaction	.91***	–	.64***	.66***	.58***	.41***	.54***	.29**	.35**	.19	.55***	.22*	.52***	.59***	.50***
3.T1 Cohesion	.79***	.68***	–	.68***	.62***	.45***	.42***	.54***	.35***	.15	.55***	.27*	.62***	.47***	.43***
4.T1 Consensus	.94***	.76***	.64***	–	.70***	.53***	.51***	.53***	.47***	.24*	.52***	.17	.57***	.61***	.49***
5.T1 Affect	.81***	.71***	.57***	.72***	–	.47***	.42***	.47***	.42***	.30**	.40***	.18	.46***	.43***	.44***
6.T2 Total DAS	.58***	.54***	.52***	.50***	.47***	–	.82***	.73***	.93***	.78***	.70***	.27**	.61***	.76***	.54***
7.T2 satisfaction	.53***	.57***	.45***	.42***	.44***	.92***	–	.61***	.70***	.56***	.65***	.14	.57***	.67***	.57***
8.T2 Cohesion	.49***	.43***	.59***	.41***	.31**	.82***	.68***	–	.63***	.46***	.56***	.23*	.65***	.46***	.43***
9.T2 Consensus	.57***	.51***	.49***	.53***	.41***	.94***	.78***	.75***	–	.68***	.59***	.21*	.44***	.63***	.42***
10.T2 Affect	.37**	.37**	.28**	.31**	.38***	.77***	.67***	.52***	.70***	–	.53***	.22*	.45***	.49***	.51***
11.T3 Total DAS	−.00	−.04	−.03	.03	.01	.21*	.27**	.18	.25*	.20*	–	.64***	.81***	.85***	.69***
12.T3 satisfaction	−.02	−.03	−.04	−.01	.01	.18	.24*	.18	.22*	.16	.89***	–	.43***	.19*	.18*
13.T3 Cohesion	.22	.15	.17	.25*	.20*	.28**	.30**	.15	.30**	.30**	.58***	.38***	–	.58***	.53***
14.T3 Consensus	−.06	−.09	−.04	−.05	−.03	.12	.14	.06	.15	.21*	.87***	.66***	.42***	–	.67***
15.T3 Affect	−.04	−.05	−.11	.01	−.04	.09	.12	.10	.15	.12	.73***	.52***	.43***	.50***	–

Correlations are intrapersonal. Above the diagonal are the wives. Bellow diagonal are the husbands

*$P < .01$, **$p < .05$, *** $P < .001$

Trajectories of Husbands' Marital Adjustment

For the total score, a three-class solution in a linear + quadratic model was selected as optimal (see Fig. 1a). The three groups were termed (1) high ($n = 162$, 82.2%; *intercept* = 108.523, $p < 0.001$; linear slope = − 0.450, $p = 0.022$; quadratic slope = 0.154, $p = 0.030$), (2) increasing ($n = 30$, 15.2%; *intercept* = 75.960, $p < 0.001$; linear slope = 3.195, $p < 0.001$; quadratic slope = 0.482, $p = 0.006$), and (3) inverse U-shaped ($n = 5$, 2.6%; *intercept* = 68.516, $p < 0.001$; linear slope = 1.930, $p = 0.010$; quadratic slope = − 1.488, $p = 0.002$).

For the satisfaction dimension, while we found that a three-class solution had the best fit indices in a linear + quadratic model, one class only included two participants, thus this solution was rejected. A three-class solution in a linear model showed optimal fit (see Fig. 1b). The groups were labeled (1) slight decreasing ($n = 162$, 82.2%;

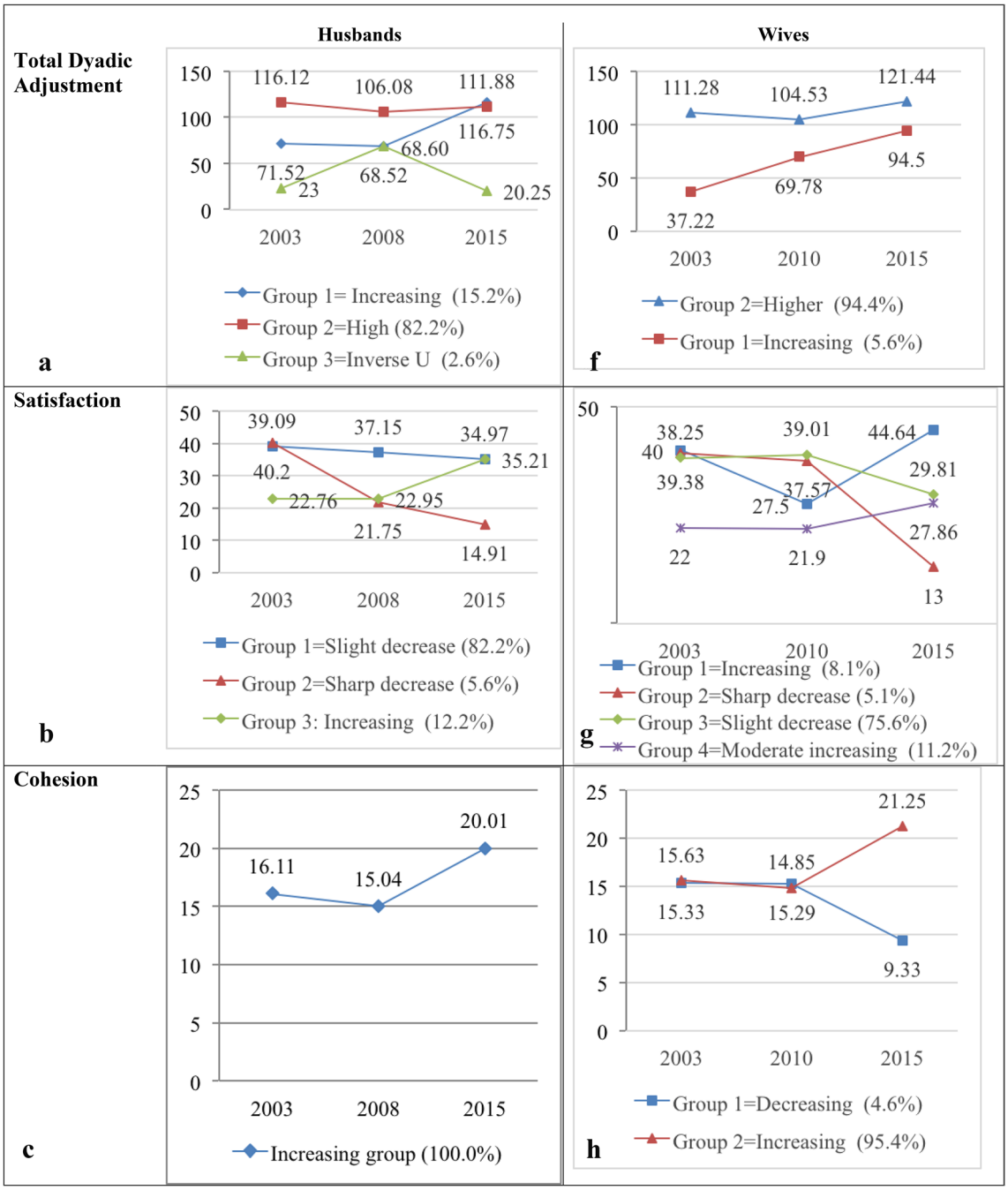

Fig. 1 Marital adjustment trajectories for husbands and wives

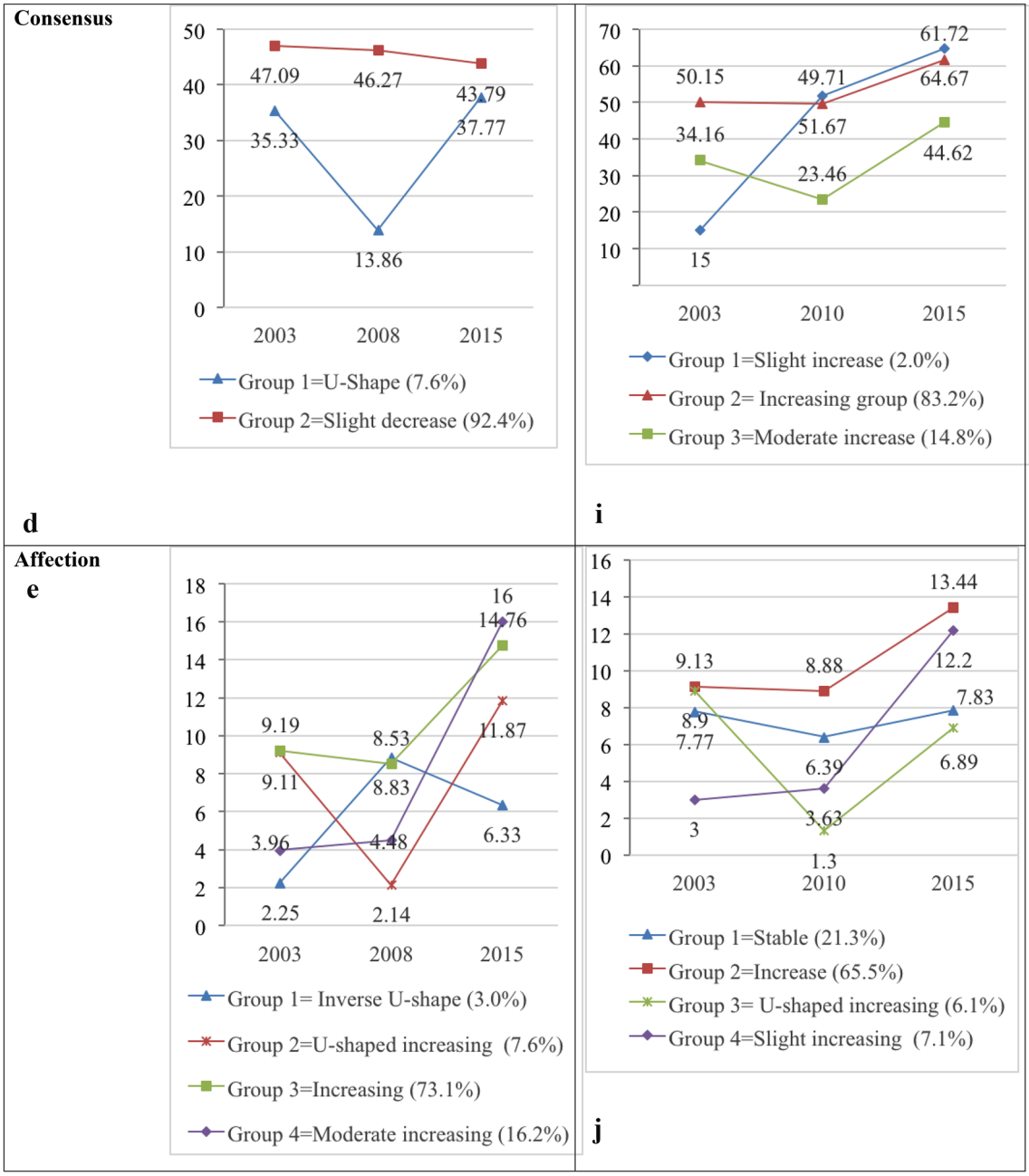

Fig. 1 (continued)

intercept = 39.067, $p < 0.001$; slope = − 0.338, $p = 0.006$), (2) sharper decrease ($n = 11$, 5.6%; *intercept* = 38.104, $p < 0.001$; slope = − 1.942, $p < 0.001$), and (3) increasing ($n = 24$, 12.2%; *intercept* = 24.502, $p < 0.001$; slope = 0.850, $p = 0.002$).

For the cohesion dimension, the three-class solution had the best fit indices in a linear + quadratic model but one class included only two participants and was therefore excluded. However, considering the two-classsolution in linear and linear + quadratic models resulted in lower entropy (< 0.6), these classes were not selected. Additionally, as the one-class solution in the linear + quadratic model did not fit the data, we determined the one class in a linear model as the optimal solution. This group was termed increasing ($n = 197$, 100%; *intercept* = 15.806, $p < 0.001$; slope = 0.330, $p = 0.002$; see Fig. 1c).

For the consensus dimension, three classes had a better fit indices in the linear and linear + quadratic models but one of them included only three participants in the linear + quadratic model and only two participants in the linear model,

thus this class was excluded. Therefore, we selected two classes in a linear + quadratic model as optimal. As seen in Fig. 1d, the two classes were labeled as the (1) U-curve group ($n = 15$, 7.6%; *intercept* = 14.234, $p < 0.001$; linear slope = − 0.510, $p = 0.378$; quadratic slope = 0.681, $p < 0.001$) and (2) the slight-decreasing group ($n = 182$, 92.4%; *intercept* = 46.835, $p < 0.001$; linear slope = − 0.206, $p = 0.035$; quadratic slope = − 0.040, $p = 0.131$).

For the affection dimension, four groups in a linear + quadratic model were selected as the optimal solution (see Fig. 1e). They were termed (1) inverse U-shape ($n = 6$, 3.0%; *intercept* = 9.388, $p < 0.001$; linear slope = 0.521, $p = 0.042$; quadratic slope = − 0.137, $p < 0.001$), (2) U-shaped increasing ($n = 15$, 7.6%; *intercept* = 2.505, $p < 0.001$; linear slope = 0.138, $p = 0.072$; quadratic slope = 0.230, $p < 0.001$), increasing ($n = 144$, 73.1%; *intercept* = 8.937, $p < 0.001$; linear slope = 0.418, $p < 0.001$; quadratic slope = 0.080, $p < 0.001$), and (3) moderate increasing ($n = 32$, 16.2%; *intercept* = 5.298, $p < 0.001$; linear slope = 0.896, $p < 0.001$; quadratic slope = 0.118, $p < 0.001$) (Table 3).

Trajectories of Wives' Marital Adjustment Over Time

For the total score, three classes in linear and linear + quadratic models were considered, however, as one class consisted of only two participants, this solution was rejected. We selected the two-class solution in the linear + quadratic model as optimal (see Fig. 1f). The groups were termed (1) increasing ($n = 11$, 5.6%; *intercept* = 72.357, $p < 0.001$; linear slope = 4.513, $p < 0.001$; quadratic slope = − 0.105, $p = 0.787$) and (2) higher ($n = 186$, 94.4%; *intercept* = 103.791, $p < 0.001$; linear slope = 1.070, $p < 0.001$; quadratic slope = 0.364, $p < 0.001$).

For the satisfaction dimension, while we found increasing fit indices from 2- to 6- classes in a linear + quadratic model, one of the groups in the 5- and 6-class solutions included only three participants, and thus they were rejected. A four-class solution in the linear + quadratic model was chosen (see Fig. 1g). The four groups were named (1) increasing ($n = 16$, 8.1%; *intercept* = 29.097, $p < 0.001$; slope = 0.591, $p = 0.008$; quadratic slope = 0.360, $p = 0.032$), (2) sharp decreasing ($n = 10$, 5.1%; *intercept* = 39.807, $p < 0.001$; slope = − 2.454, $p < 0.001$; quadratic slope = − 0.404, $p < 0.001$), (3) slight decreasing ($n = 149$, 75.6%; *intercept* = 39.542, $p < 0.001$; slope = − 0.814, $p < 0.001$; quadratic slope = − 0.161, $p < 0.001$), and (4) moderate increasing ($n = 22$, 11.2%; *intercept* = 21.958, $p < 0.001$; slope = 0.353, $p = 0.141$; quadratic slope = 0.093, $p = 0.021$).

For the cohesion dimension, the two-classsolution had the best fit indices in the linear + quadratic model and were, therefore, selected (see Fig. 1h). The first group was labeled (1) decreasing ($n = 9$, 4.6%; *intercept* = 15.431, $p < 0.001$; linear slope = − 0.439, $p < 0.001$; quadratic slope = − 0.113, $p = 0.278$) and the (2) second group was labeled increasing ($n = 188$, 95.4%; *intercept* = 14.242, $p < 0.001$; linear slope = 0.535, $p < 0.001$; quadratic slope = 0.118, $p < 0.001$).

For the consensus dimension, while we found that fit indices improved from 4- to 5- classes in a linear + quadratic model, one group of the 4- and 5-class solutions consisted of two or less participants, respectively, and thus they were excluded. We selected three classes in the linear + quadratic model as optimal (see Fig. 1i). The groups were named (1) slight increase ($n = 4$, 2.0%; *intercept* = 46.389, $p < 0.001$; linear slope = 3.763, $p < 0.001$; quadratic slope = − 0.175, $p = 0.086$), (2) increasing ($n = 163$, 83.2%; *intercept* = 49.056, $p < 0.001$; linear slope = 1.088, $p < 0.001$; quadratic slope = 0.198, $p < 0.001$), and (3) moderate increasing ($n = 29$, 14.8%; *intercept* = 24.387, $p < 0.001$; linear slope = 1.266, $p < 0.01$; quadratic slope = 0.491, $p < 0.001$).

For the affection dimension, four classes in a linear + quadratic model were selected as the optimal solution (see Fig. 1j). They were termed (1) stable ($n = 42$, 21.3%; *intercept* = 6.840, $p < 0.001$; linear slope = 0.039, $p = 0.415$; quadratic slope = 0.028, $p = 0.179$), (2) increasing ($n = 129$, 65.5%; *intercept* = 8.646, $p < 0.001$; linear slope = 0.406, $p < 0.001$; quadratic slope = 0.079, $p < 0.001$), (3) U-shaped increasing ($n = 12$, 6.1%; *intercept* = 2.219, $p < 0.01$; linear slope = − 0.048, $p = 0.265$; quadratic slope = 0.168, $p < 0.001$), and (4) slight increasing ($n = 14$, 7.1%; *intercept* = 3.545, $p = 0.335$; linear slope = 0.837, $p < 0.001$; quadratic slope = 0.117, $p = 0.308$) (Table 4).

Discussion

This study had two aims. The first was to explore the following trajectories of marital adjustment in middle-aged couples: overall adjustment, affection, satisfaction, cohesion, and consensus. The second aim was to assess and compare the trajectories of marital adjustment for husbands and wives across the three time points of data collection.

Overall Adjustment

In line with several previous longitudinal studies of marital adjustment (e.g. Vanlaningham et al. 2001; Beach et al. 2005; Kamp Dush et al. 2008; Anderson et al. 2010; Lavner and Bradbury 2012), in the current study both husbands and wives reported being generally satisfied in their marriages. This is of note due to the length of our study, measuring marital adjustment over 12 years, which is longer than previous studies. Eighty-two percent of the husbands and 94% of the wives reported high adjustment at all measurements, albeit at varying levels of intensity. The husbands initially reported higher overall adjustment than their wives, with more variability in their assessment

Table 3 Quadratic and linear changes in dyadic adjustment amongst husbands over time

	Linear model						Linear + quadratic model			
	Model	AIC	BIC	Adj BIC	Entropy	BLRT	AIC	BIC	Adj BIC	Entropy	BLRT
Total scores	1 class	4015.987	4042.253	4016.909	–	–	3936.075	3988.607	3937.919	–	–
	2 classes	3948.544	3984.659	3949.812	0.981	73.443***	3936.075	3988.607	3937.919	0.993	86.663***
	3 classes	3932.818	3978.783	3934.432	0.814	21.726***	**3919.005**	**3984.669**	**3921.310**	**0.832**	**25.071****
	4 classes	3926.770	3982.585	3928.729	0.838	12.048	3912.179	3990.975	3914.945	0.811	14.826
Satisfaction dimension	1 class	3053.147	3079.413	3054.069	–	–	–	–	–	–	–
	2 classes	3022.772	3058.887	3024.039	0.911	36.376***	3021.209	3073.741	3023.053	0.931	47.829***
	3 classes	**3013.742**	**3059.707**	**3015.356**	**0.754**	**15.029***	3009.271	3074.935	3011.576	0.933	19.939**
	4 classes	3011.061	3066.875	3013.020	0.718	8.682	–	–	–	–	–
Cohesion dimension	1 class	**2398.399**	**2424.623**	**2399.280**	–	–	–	–	–	–	–
	2 classes	2396.821	2432.880	2398.033	0.552	7.578	2374.338	2426.788	2376.101	0.543	7.609
	3 classes	2394.994	2440.888	2396.537	0.713	7.827	2369.939	2435.501	2372.143	0.743	12.399*
	4 classes	2397.366	2453.093	2399.239	0.622	3.629	2368.389	2447.064	2371.035	0.771	8.507
Consensus dimension	1 class	3216.774	3243.040	3217.696	–	–	–	–	–	–	–
	2 classes	3202.638	3238.753	3203.905	0.721	20.137***	**3206.323**	**3258.854**	**3208.167**	**0.807**	**25.392*****
	3 classes	3192.556	3238.521	3194.170	0.823	16.081**	3185.635	3251.299	3187.940	0.860	28.688***
	4 classes	3187.504	3243.319	3189.464	0.861	11.052	3176.514	3255.311	3179.280	0.774	17.121
Affect dimension	1 class	2302.528	2328.794	2303.450	–	–	–	–	–	–	–
	2 classes	2277.934	2314.049	2279.201	0.701	30.594***	2175.090	2227.621	2176.934	0.743	30.729***
	3 classes	2271.911	2317.876	2273.524	0.792	12.023*	2170.431	2236.095	2172.736	0.831	12.659†
	4 classes	2269.504	2325.318	2271.463	0.745	8.407	**2155.380**	**2234.177**	**2158.146**	**0.777**	**23.051****
	5 classes	2257.960	2323.624	2260.265	0.743	11.924*	–	–	–		

*$p < .05$; **$p < .01$; ***$p < .001$

Table 4 Quadratic and linear changes in dyadic adjustment amongst wives over time

	Linear model						Linear + quadratic model				
	Model	AIC	BIC	Adj BIC	Entropy	BLRT	AIC	BIC	Adj BIC	Entropy	BLRT
	1 class	3780.643	3806.909	3781.565	–	–	–	–	–	–	–
Total scores	2 classes	3751.745	3787.860	3753.012	0.814	34.899***	**3722.722**	**3775.253**	**3724.566**	**0.856**	**35.324*** **
	3 classes	3731.409	3777.374	3733.023	0.873	26.336***	3704.404	3770.068	3706.709	0.902	26.317**
	4 classes	3730.464	3786.279	3732.423	0.746	6.945	3692.766	3771.562	3695.532	0.796	19.639
	1 class	2871.054	2897.320	2871.976	–	–	–	–	–	–	–
Satisfaction dimension	2 classes	2856.747	2892.862	2858.015	0.968	20.307***	2831.237	2883.768	2833.081	0.744	38.475***
	3 classes	2850.950	2896.915	2852.563	0.719	11.797	2821.438	2887.102	2823.743	0.797	17.799***
	4 classes	2845.706	2901.521	2847.666	0.857	11.243	**2807.476**	**2886.273**	**2810.242**	**0.797**	**21.961*** **
	5 classes	2839.212	2904.876	2841.517	0.716	12.495	2798.104	2890.034	2801.331	0.791	14.911**
	6 classes	2837.511	2913.025	2840.162	0.752	7.701	2774.598	2879.661	2778.286	0.793	32.786***
	1 class	2551.434	2577.700	2552.356	–	–	–	–	–	–	–
Cohesion dimension	2 classes	2543.445	2579.561	2544.713	0.628	13.989*	**2481.351**	**2533.882**	**2483.195**	**0.856**	**22.747** **
	3 classes	2545.044	2591.009	2546.658	0.522	4.401	2476.672	2542.336	2478.977	0.624	12.679
	4 classes	2532.710	2588.524	2534.669	0.653	18.334*	2476.965	2555.762	2479.731	0.618	7.707
	1 class	3157.482	3183.707	3158.364	–	–	–	–	–	–	–
Consensus dimension	**2 classes**	3128.173	3164.232	3129.385	0.806	35.309***	3066.460	3118.910	3068.224	0.862	38.306 ***
	3 classes	3122.674	3168.568	3124.217	0.785	11.499	3055.496	3121.058	3057.700	0.793	18.964 *
	4 classes	3112.781	3168.509	3114.655	0.799	15.893*	3040.468	3119.143	3043.113	0.838	23.028**
	5 classes	3114.334	3179.896	3116.538	0.663	4.448	3032.719	3124.506	3035.805	0.846	15.749*
	6 classes	3107.770	3183.167	3110.305	0.761	12.564	3032.822	3137.722	3036.349	0.840	7.896
	1 class	2100.831	2127.096	2101.753	–	–	–	–	–	–	–
Affect dimension	2 classes	2074.689	2110.804	2075.957	0.638	32.142***	1996.790	2049.322	1998.634	0.664	34.754***
	3 classes	2067.932	2113.897	2069.545	0.679	12.757*	1986.673	2052.337	1988.978	0.724	18.117*
	4 classes	2064.151	2119.965	2066.110	0.673	9.781	**1980.008**	**2058.805**	**1982.774**	**0.725**	**14.665***
	5 classes	2063.213	2128.877	2065.518	0.710	6.937	1974.871	2066.801	1978.098	0.748	11.657

*$p < .05$; **$p < .01$; ***$p < .001$

of adjustment over time. A small minority (2.6%) of husbands reported a sharp decrease in marital adjustment in T3. Of the wives, those who reported higher levels of overall adjustment consistently reported higher levels over time.

Furthermore, the mean DAS scores found in this study are on par with the results of other studies, which demonstrated that couples presented as being overall satisfied in their relationships. Mean DAS values found in this study were comparable to couples who had been married for an average of 13 years (Fişiloğlu and Demir 2000), as well as to couples in a study of long-term relationships (South et al. 2009). As participants in our study have been married for an average of three decades, they have made the choice to remain in their marriages. Thus, it is likely that the couples were in particularly resilient marriages, which was reflected in their overall ability to overcome hardship and life challenges (Waldinger and Schulz 2010). Second, in line with the "honeymoon-as-ceiling-effect" as previously discussed, it is likely that these marriages maintained previous overall high levels of adjustment (Proulx et al. 2017). Therefore, the couples in this study have been in relationships that, overall, have been shown to remain positive with time.

The results further revealed that the majority of husbands and wives reported an increase of general marital satisfaction from T2 to T3 as they made the transition into older age. There are several possible explanations for this development. In line with the SST, it is possible that the participants prioritized their marriages and partners, and opted to invest more time and energy in regards to their loved one and their marriage (Carstensen 1995; Carstensen et al. 1999). Indeed, "theoretically, selectivity should be greatest in old age because this is the time in life when endings are most salient" (Carstensen et al. 1999, p. 173). Therefore, as the couples have grown older, they may have experienced a renewed sense of commitment to one another (Orbuch et al. 1996), or, on the other hand, an increased interdependency as family, finances, and property become ever more intertwined (Nock 1995). As spouses age, they can become even more central in each other's social support networks and might be further unified as they share children and grandchildren. Additionally, with each passing year, the couple may learn to successfully manage conflict, coordinate their goals, establish an emotional climate and create a sense of meaning that is optimal for both partners (Hoppmann and Gerstorf 2009).

Despite similarities in the overall adjustment scores of both partners, variations in the trajectories of marital adjustment between the genders were found in their reports of satisfaction, cohesion, consensus, and affection across the 12 years of this study.

Satisfaction

Overall, the partners reported similar initial levels of satisfaction with a decline over time. The majority of the wives reported a sharper decline in satisfaction over time than the majority of the husbands. This finding dovetails with previous studies. For example, in an international study of over 1000 couples, longer relationship duration was found to predict greater sexual as well as relationship happiness for men (Heiman et al. 2011). Several explanations may account for this finding. It has been suggested that husbands may be more satisfied in their marriage than their wives due to factors such as inequalities in both power and task-related chores (Jackson et al. 2014). For instance, it may be the wife's responsibility to work a "second shift" after she returns home each day from work (Hochschild 1989). In Israeli society, wherein traditional gender roles are predominantly endorsed, the wife is often the main caretaker of the household (Moore and Gobi 1995). In addition, as a wife ages, she may find herself "sandwiched" between the responsibility of caring for the couple's young adult children and grandchildren as well as for her and her husband's aging parents. This may increase her caregiving burden (Fowers 1991; Ward and Spitze 1998; Dekel et al. 2005; Parker and Patten 2013; Boerner et al. 2014). Furthermore, the partners may be dealing with "empty nest syndrome" as their children leave home, leading to a shift in their role as parents (Bouchard 2014) and the responsibilities of parenthood (Hirschberger et al. 2009). Moreover, the partners' decline in marital satisfaction may be impacted by such factors as a decline in health (Badr and Acitelli 2005; Umberson et al. 2006). At the same time, wives in middle age may also be grappling with depression or emotional changes that occur in the aftermath of menopause (Schmidt et al. 2004). Overall, an accumulation of stressors may potentially negatively impact marital satisfaction at this stage in life.

Cohesion

Unlike the other domains, all husbands reported a single stable linear increase in cohesion across the three time points. The majority of wives reported a sharp increase in cohesion between the second and third time points, with only a small group of women (5%) reporting a sharp decrease in cohesion. These findings suggest that the couples' high level of cohesion particularly contributed to their high levels of overall marital adjustment.

A possible explanation for the rise in cohesion may be related to retirement. As the age of retirement in Israel is 62 for women and 67 for men (The National Insurance Institute of Israel 2017), by the later waves of this study it is possible that the partners had left the workforce and had more time to spend together and focus on their dyad. Retirement

within the previous two years has been associated with an increase in morale for the majority of husbands (Kim and Moen 2002). Although under certain circumstances it can lead to distress (Vo et al. 2014) or tension (Szinovacz and Davey 2005) within the relationship, this new period in life can also lead to more time to pursue interests and share time with loved ones. Just as there were few differences between the genders found here, so too has the research on retirement found few differences between the genders. Rather, it was found that differences between the partners could be attributed to factors such as health, finances, social support, and whether one spouse was retired while the other remained in the workforce (Talaga and Beerh 1995; Kulik 2001; Kubicek et al. 2011; Vo et al. 2014).

Consensus

The majority of husbands reported high, though slightly decreasing, levels of consensus over time. A small percentage of the husbands (7.6%) reported a sharp decrease, followed by a steep increase across the three waves. The wives reported more variability as well as higher and increasing levels of consensus than their husbands. Given the paucity of studies on the role of consensus in long-term marriages, the findings of this study make an important contribution to the existing literature.

Generally, high levels of consensus have been found to be positively correlated with relationship satisfaction and negatively correlated with conflict, as consensus plays an important role in resolving conflicts (Cramer 2001). Scholars have argued that couples in an egalitarian marriage have higher marital quality, otherwise referred to as the companionate model of marriage (e.g., Wilcox and Nock 2006; Amato et al. 2007). This model posits that marriages are higher in quality (and lower in conflict) when partners share equally in the decision-making and labor within the household. A defining characteristic of egalitarian marriages is shared decision-making, which is arguably a form of consensus (Kamp Dush and Taylor 2012). Given the high levels of overall marital adjustment that the partners reported in this study, it is unsurprising that they would also report high levels of consensus. In long-term marriages, partners may come to agree on a variety of factors (Gonzaga et al. 2010) and have even been found to exhibit similarities to one another (Gaunt 2006).

Affection

Overall, husbands reported more changes in affection and all husbands reported an increase in affection over time. The wives displayed different results. One-fifth reported stable levels of affection, while almost three-quarters of the wives reported an increase in affection between the second and third waves. In contrast to their husbands, the wives' levels of affection increased by the third wave but remained lower than their initial rating.

There are several possibilities as to why, for a small but significant number of the husbands and wives, the rating of affection dipped in the second wave yet improved by the third wave. It is possible that physical or sexual changes occurring mid-life impacted affection. Indeed, the differences in affection between the genders found in our study dovetail with a 12-year study of elderly German men and women in long-term relationships (Müller et al. 2014). Affection and sexual activity were found to be more important for men than for women; overall, affection was found to be more important than sex for both genders as the participants aged (Müller et al. 2014). Thus, as partners age they may experience physical, sexual and emotional changes, which could negatively affect sexual intimacy; at the same time, these changes may provide the opportunity to discover other positive means of expressing affection (Calasanti and Slevin 2001; Lodge and Umberson 2012). Therefore, they may find new ways of engaging with one another, whether via a "second honeymoon", or by finding new ways to demonstrate sexual interest or affection. Furthermore, it is possible that the couple has more quality time and energy to devote to one another—whether sexually or in leisure activities—in the aftermath of retirement, and this is manifested in an upswing of affection.

Possible limitations of this study include sample size constraints and the fact that the data analyses do not statistically link or account for partners. Limitations also include the use of self-report measures and the lack of qualitative or third party observational data; therefore, the responses may be impacted by self-report bias. A consequence of self-reporting may be reflected in the high reports of marital adjustment as the participants may not wish to disclose the unhappiness they feel in their relationships. As the family unit has a central role in Israeli society, the couple may wish to keep their marriage and family intact. Furthermore, a partner's assessment of marital adjustment may be impacted by the cultural expectations regarding marriage. For example, of the individuals born in Israel between 1948 and 1957, over 95% are married (Okun 2013) and are significantly less likely to divorce compared to couples aged 30–50 (Israel's Central Bureau of Statistics 2016). Therefore, the cohort examined here may maintain traditional, collectivist views of marriage and choose not to divorce (Kulik 2004). This sample's traditional view of marriage could also be due in part to cohort effects (Lucier-Greer and Adler-Baeder 2011) and the expectations of how to behave in line with socially constructed gender roles, thereby affecting their reports.

A further limitation may be that participants were former military combatants and their spouses, which is the norm in Israel where the vast majority of the population participates in

compulsory army service. Nevertheless, future studies should explore whether the different aspects of marital adjustment develop similarly over time in different cultural contexts. Additionally, another limitation is that some of the classes are small even though we have considered them theoretically meaningful. Finally, while this study examined the data dyadically, we did not explore the marital adjustment within each couple. The focus was on each gender as a whole, rather than on the specific adjustment within each couple. Further longitudinal studies are required to better understand marital adjustment within a couple.

Despite these limitations, the findings here have several clinical and research implications. In the current study, the different aspects of marital adjustment presented a complex and heterogeneous picture of stability and change over time. This finding highlights the multifaceted nature of marital relationships and suggests that therapists are advised to make domain-specific assessments of their clients' marital adjustment, as it may be high in some domains yet low in others. A detailed assessment of the different aspects of the marital relationship would allow for interventions to be specifically tailored to each couples' relationship needs. Moreover, in times of relationship challenges, the therapist can assure their clients that even when there is a period of decline, relationships are dynamic and naturally change and evolve. For example, as seen in this study, some participants experienced declines in consensus and affection in the second wave, only to improve by the third wave. Such an illustration may help the couples in gaining a hopeful perspective on possible relationship changes.

As life expectancy increases, it would be increasingly relevant for future studies to examine couples as they further advance in the aging process. Furthermore, it would be of great interest to explore whether marital adjustment continues to increase as the partners age, a trend which would be in-line with the assumptions of the SST. On the other hand, it would be interesting to explore the trajectories of the various aspects of marital adjustment in young couples in their first decade of marriage. Gender-specific trajectories could then be compared to those of partners who have remained together for decades. Finally, the intra- and interpersonal predictors of the different trajectories should be evaluated to determine what causes some marriages to have higher adjustment than others in older adulthood. This would increase our understanding of the predictors of the disadvantageous trajectories, allowing for the development of appropriate psychoeducation and therapy interventions.

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