

Abstract

This study investigates gender differences in trajectories of support from close relationships among adults in the transition from middle to old age, taking into account stability and change in the identity of close persons. Multilevel modelling was used to estimate gendered age-trajectories in three dimensions of support: emotional support, practical support and negative encounters, repeatedly measured over ten years amongst 6,718 Whitehall II participants. Men were more likely than women to nominate their partner as their closest person throughout follow-up; whereas women drew support from a wider range of sources. Gender differences were only evident in age-related trajectories of emotional support, contingent on stability and change in the closest relationships. Men reported increases in emotional support from closest relationships with age, except for those who transitioned out of a partnership. For women, levels of emotional support were static with age for those whose closest person remained stable, but decreased with age for those who experienced a transition in their closest person from or to a partner. Further, emotional support increased with age for all married men, while this was only the case for married women who nominated their partner as their closest person. Our analysis highlights gender-specific trajectories of perceived support from the closest relationships in late life, indicating more pronounced socioemotional selectivity in old men than women.

Key Words: Gender- Close relationship trajectory - Longitudinal study

Introduction

Developing and maintaining satisfying relationships with close social partners is essential to health (Cohen 2004) and wellbeing (Demakakos, McMunn and Steptoe 2010, Litwin and Stoeckel 2013). The effect size of social relationships on mortality is comparable with many well-established mortality risk factors (Holt-Lunstad, Smith and Layton 2010). The importance of close social relationships becomes particularly prominent as individuals age. Emotional closeness has been shown to become more salient as future-time horizons shorten (Carstensen, Isaacowitz and Charles 1999). Additionally, older adults rely on their closest social relationships for emotional and practical support (Mejía and Hooker 2015), and it is exchanges of support that draw social partners closer over time (Kahn and Antonucci 1980). Close social relationships in older adulthood are also conditioned by experiences of ageing, such as disruptions in social ties (Rook 2009) and gradual declines in physical and mental functioning (Broese van Groenou, Hoogendijk and Van Tilburg 2013). Men and women differ in their experiences of ageing (Arber, Davidson and Ginn 2003), and this study closely examines the implications of gender for older adults' closest relationships over time. Drawing from socioemotional selectivity theory (Carstensen, *et al.* 1999) and the convoy model of social support (Kahn and Antonucci 1980), we examine gender differences in the likelihood of change in the type of relationship older adults identify as closest, age-related trajectories of social support from the closest relationship, and implications of change in whom one identifies as closest for these support trajectories.

Theoretical Framing

As the significance of social relationships increases with age, so does attention to enhancing emotional closeness within relationships (Carstensen, Fung and Charles 2003). Two complementary theoretical frameworks characterize social relationships in late life. The social convoy model describes how a collection of social relationships, strengthened

via exchanges of support, travels with individuals over time and adapts to changing personal and situational characteristics (Antonucci, Birditt and Ajrouch 2011, Kahn and Antonucci 1980). Similarly, the socioemotional selectivity theory posits that, as the perception of limited future time increases, individuals orient their social goals towards attending to emotionally rewarding close relationships and proactively winnow peripheral social ties (Carstensen 2006, Carstensen, *et al.* 2003). Together, these perspectives suggest that through the careful attention to and selection of close relationships, despite inevitable network changes with age, older people with resources to optimize relationships are able to maintain or even improve the quality of their social relationships (Gurung, Taylor and Seeman 2003, Lang, Rieckmann and Baltes 2002).

Gender differences in the likelihood of change in the closest person

Gender differences in trajectories of social support

Gender differences in impact of changes in the closest person on support trajectories

A growing body of longitudinal studies corroborates these theories, and highlights the multidimensional construct of support derived from social relationships. The most cited support dimensions were conceptualized by House (1981), and include emotional, practical, informational and appraisal support; which can be further regrouped as ‘emotional’ and ‘practical’, with informational and appraisal support allied to the emotional category (Gottlieb and Bergen 2010). *Emotional support* includes provision of empathy, reassurance and information, whereas *practical support* involves tangible aid and helping behaviors. Conversely, well-intentioned support may elicit social strain (*negative encounters*) if the recipient finds support is unsuitable, intrusive or over-controlling (Rook 1984). Most studies have found small yet significant age-related increases in emotional support and practical support (Gurung, *et al.* 2003, Martire, *et al.* 1999, Van Tilburg, Groenou and Broese 2002); and relatively stable or decreased longitudinal changing patterns of negative encounters

(Birditt, Jackey and Antonucci 2009, Boerner, *et al.* 2004, Krause and Rook 2003, Shaw, *et al.* 2007). Yet less is known about the implications of stability and change whom one feels closest to, the support that this *closest person* provides, and the extent to which these processes differ for men and women (Antonucci, Ajrouch and Birditt 2013).

Processes of optimization, winnowing, and adaptation to loss would suggest that the identity of one's closest person changes over time. Change in close relationships could be due to efforts to manage emotional closeness, as suggested by socioemotional selectivity theory, or change in characteristics of the person and situation over time, as suggested by the social convoy model. Convoys of support may be gendered because roles and expectations differ (Knecht, *et al.* 2008). Women have been found to have more extensive social networks and are more intimate in their relationships than men (Fuhrer and Stansfeld 2002, Van Tilburg, *et al.* 2002). On the other hand, evidence to date indicates that men tend to maintain close relations with fewer people, primarily their spouses (Fuhrer and Stansfeld 2002), thereby drawing most support from these intimate ties (Gurung, *et al.* 2003). Additionally, the emotional experience of close relationships has also been found to differ for men and women. Compared to their spouses, men have been found to be more defensive and less sensitive to appraisals of marital quality, whereas wives have been shown to be more expressive in affect (Boerner, *et al.* 2014, Carstensen, Gottman and Levenson 1995), which could differentiate patterns of stability and change in close relationships. Although change in the closest person, has yet to be examined longitudinally, we would expect that change in close relationships is driven by change in the situation for men, and by socioemotional processes for women.

Theory suggests that change in close relationships also has implications for social support. To the extent that it reflects processes of selection and adaptation (Carstensen, *et al.* 1999), change in the close relationships should foster stable or increased social support

over time. However, this change may also result from variation in the characteristics of the situation and person beyond individual control. Insofar as change in close relationships reflects such loss, it may be followed by decreased social support (Rook 2009). Further, gender differences in experiences of ageing and socioemotional processes suggest that the implications of change in close relationships for support may also vary by gender. With less experience in expanding and managing their social ties, for example, men may fare worse following the loss of a close social relationship (Davidson 2001). If women are more likely to manage their close social ties (Fuhrer and Stansfeld 2002, Van Tilburg, *et al.* 2002), change in whom they identify as closest may be supportive of rather than detrimental to social support.

There is also a potential that as roles and priorities shift at different life stages, gendered differences in social relationships may attenuate with advancing age (Coventry, *et al.* 2004). As men have generally had stronger ties to paid work in midlife, retirement may signify a greater shift in focus for men towards family life and close interpersonal relationships (Arber, *et al.* 2003). There is evidence that older men experience age-related increases in contact with their family (Martire, *et al.* 1999), and receive increasing levels of emotional and practical support (Shaw, *et al.* 2007) from their spouse and mature children (Coventry, *et al.* 2004). Compared with their male counterparts, older women tend to live longer (United Nations 2013) and are more likely to experience age-related disadvantages, such as the loss of a spouse (Ajrouch, Blandon and Antonucci 2005, Davidson 2001). Given the mixed evidence so far, it is therefore important to examine how support from close relationships endures over time for men and women, taking into account the gendered effect of stability and change in whom one identifies as closest.

Using the Whitehall II prospective cohort, this study aims to investigate gender specific age trajectories of support from close social relationships. Our study has three aims: first is

to examine gender differences in the likelihood of change in the type of relationship older adults nominate as their closest person. Drawing from known gender differences in age-related experiences and socioemotional processes, we expect that women will be more likely than men to change the type of relationship that is identified as closest during the study period. Our second aim is to examine gender differences in the trajectories of social support beyond and above patterns of stability and change in the identity of the closest person. On the basis of previous evidence, we expect that age-related changes in support provided by the closest person will increase for men but not for women. Our third and final aim is to explore gender differences in the impact of changes in close relationships on these support trajectories over time. We expect that women are more likely to adapt to changes in close relationships, whereas for men, these changes will be a detriment to perceived social support from the closest social relationship.

Methods

Study participants

The Whitehall II cohort recruited 10,308 participants (66% male, aged 35-55 at baseline) from 20 London based civil service departments in 1985-1988. At study baseline, all participants underwent clinical health check-ups and completed self-administrated questionnaires. Subsequent data collection was administered approximately every two years, alternating between postal questionnaires alone and postal questionnaires accompanied by clinic check-ups (Marmot and Brunner 2005). Social support from the closest person was measured in the entire cohort at Phase 5 (1997-1999), Phase 7 (2002-2004) and Phase 9 (2007-2009). Ethical approval for the Whitehall II study was obtained from the University College London Medical School Committees on the Ethics of Human Research. All participants are asked to give written informed consent at each phase.

Of the 10,308 participants at Whitehall II inception (1985-1988), 306 (3%) had died and 752 (7%) had withdrawn before the start of phase 5 data collection, the baseline of current study. Among the 9,250 participants remaining in the cohort, 7,908 (85%) had at least one of the three close relationship measures over 10 years; the current analyses were based on 6,718(73%) participants who had at least one phase of social support measures and data on all covariates. Participants included had higher socioeconomic positions and were more likely to be married than those who were not eligible for the current analysis. Participants with complete social relationship data for all three phases (76.5%) reported similar amounts of support at phase 5 as those who had missing data during the study follow-up (P-values for each support measure range 0.09-0.74).

Support from close relationships

The Close Persons Questionnaire (CPQ) was used to assess support from the close relationships (Stansfeld and Marmot 1992). Respondents were invited to nominate the person to whom they felt closest in the last 12 months. Over 70% of participants identified their spouse or partner as the closest person, 16% nominated another relative, 13% a friend and less than 1% nominated a heterogeneous group of others (e.g. God, pets and social workers etc.). In calculating the stability and change in the identity of the closest person over time, we combined those nominating other relatives, friends and others into a ‘non-partner’ group (i.e. spouse/partner=0, no-partner=1), as similar age-related trajectories of support were identified across these non-partner groups.

Factor analysis of the 14-item CPQ resulted in three subscales of support (Stansfeld and Marmot 1992): emotional support, practical support and negative encounters. Emotional support (7 items, Cronbach’s α ranges from 0.85-0.86 over phases) included being given information and guidance, wanting to confide, sharing interests, boosting self-esteem, exchanging personal problems and reciprocity. Practical support (3 items, Cronbach’s α :

0.78-0.82) indicated the needs and perceived receipt of tangible support, such as financial assistance or aid in daily chores. These two support subscales measured the positive aspects of support. Negative encounters (4 items, Cronbach's α : 0.63-0.65) captured adverse interactions (e.g. making things worse, giving worries, problems and stress) and inadequacy of support (e.g. need more help). Each item was rated on a four-point Likert scale (i.e. not at all=1, a little=2, quite a lot=3 and a great deal=4), with higher scores indicating greater positive or negative aspects of close relationships.

Covariates

The following socio-demographic variables measured at phase 5 were included: year of birth (range 1930-1952, centred at 1940) to adjust for the birth cohort effect, ethnicity (white=0 and non-white=1), educational attainment (university or higher degree=0, secondary education=1, and no formal education=2), and the British civil services grades of employment (administrative [high=0], professional or executive [medium=1], and clerical or support [low=2]). Marital status (married/cohabiting=0, non-married=1) at phase 5, 7 and 9 was included as a time varying covariate. Health status was assessed by the Short Form 36 Health Survey (SF-36) (Ware Jr and Sherbourne 1992). The eight scales of the SF-36 were summarised into physical and mental function components (range 0-100, centred at 50), with a lower score indicating poor function.

Age (range 45-69, centred at age 60) and gender (male=0, female=1) were the main independent variables of interest, as we examined age related trajectories of social support and gender variations in these trajectories.

Statistical analysis

Gender differences in the socio-demographic characteristics of the analysis sample were assessed by chi-square for categorical variable and the analysis for variance (ANOVA) for continuous variables. To examine gender differences in stability and change in the

closest persons, we used multinomial logit models to estimate the gender-specific probability of nominating a partner or non-partner as the closest person conditional on covariates included.

Longitudinal trajectories of social support were estimated using multilevel models, which account for dependency between repeat measures within persons and unbalanced research designs (e.g. differences in length of follow-up). We utilized an age-based time metric to investigate how social support from the closest person changed as a function of age (Note: we tested a nonlinear model by adding age squared. As the quadratic age was non-significant, we simplified the model by using linear age only). Both intercept and slope were fitted as random effects, allowing individual differences both at mean age and annual rate of change. All models were controlled for socio-demographic and health conditions at analysis baseline and marital status over follow-up. The stability and change in the identity of the close person was also controlled for to assess the extent to which differences in nominating the closest social partner would explain variations in these support trajectories. The main effects of the stability and change in the closest person represent the associations between these variables and the perceived level of social support at the mean age of the study sample (age 60); the multiplicative terms with age estimate their effects on the support trajectories over time. We then introduced a three-way interaction between type of close relationships, gender and age to estimate gender-specific support age-trajectories by stability and change in close relationships. Finally, to further exclude any artificial effect due to gender differences in marital status, we examined these age-trajectories of support by close person's identities among a subsample of continuously married participants. To facilitate interpretation, significant results are presented graphically.

Missing data were handled with full information maximum likelihood (FIML) procedures, which uses both partially or fully complete cases to estimate parameters (Enders and

Bandalos 2001). Robust maximum likelihood (MLR) estimation was used to provide corrected standard errors adjusted for the non-normality of the data. The model fit was tested using the log-likelihood ratio test, Akaike information criterion (AIC) and Bayesian information criterion (BIC). All analyses were performed with STATA SE version 12.

Results

Sample description

Table 1 presents the characteristics of the analysis sample by gender. Compared to men, women were slightly older and more likely to be ethnic minorities. Women were also much less likely to have a university education or be employed in a high grade job, and showed lower physical and mental functioning scores than their male counterparts. The majority of men were married or cohabiting at each phase of the study. In contrast, only half of the female participants were married or cohabiting by Phase 9. Most men nominated their spouse or partner as their closest person and the percentage of this nomination gradually increased over phases, whereas the opposite trend showed in their female counterparts. Gender differences were apparent in the raw scores of each support type over time. The average levels of emotional support increased for men but decreased for women. Women also reported significantly lower levels of practical support than men, but higher levels of negative encounters, except at the first phase of the study.

Probability of stability and change in the identity of the closest person

Figure 1 illustrates the gender-specific probabilities of stability and change in the identity of close person adjusting for variations in marital status, socio-demographic circumstance and health status. Over the 10-year follow-up, 74% men always nominated their partner as the closest social partner in comparison with 40% of women. In contrast, women were substantially more likely to always nominate a non-partner as the closest

person, and nearly twice as likely as men to change their nominated closest person from a partner to a non-partner.

Gender-specific trajectories of support from the closest relationship

Table 2 provides the parameter estimates for gender differences in the age-based trajectories of support, taking into account the stability and change in close relationships. Consistent with our expectations, although the estimated mean level of emotional support at age 60 was higher in women than in men, this gender difference in emotional support became smaller as respondents aged (female*age: -0.06, SE (standard error) 0.01). On the other hand, compared to men, women showed a similar rate of decline in practical support (female* age 0.01, SE 0.01) and slightly more gradual decline in negative encounters (female*age 0.02, SE 0.01).

Implications of change in identity of the closest person on support trajectories

Table 2 also shows the parameter estimates for the effect of change in the identity of the closest person on support trajectories. Compared to participants who always nominated their partner, the level of both emotional and practical support was lower and negative encounters were higher for those who switched from identifying a partner to a non-partner as their closest person. In contrast, switching from a non-partner to a partner was associated with increased practical support and negative encounters. However, only the effect of change in the closest person on the trajectory of emotional support varied by gender, as illustrated in Figure 2. For men, emotional support increased with age in all categories except for those whose closest person shifted from their partner to a non-partner. For women, in contrast, emotional support remained stable for those who consistently nominated the same closest person, but decreased markedly amongst those changing whom they identified as their closest person.

Supplementary analysis

Because women in this occupational cohort were much less likely than men to be married, we re-examined these gender patterns in the close person identities and age-trajectories of support in a subsample of participants who were continuously married over follow-up (n = 4,717). Married men were more likely than married women to nominate a spouse as their closest person (89.7% vs 72.4%). Gendered pattern in trajectories of emotional support held in this sub-sample (Figure 3). Among all married men, emotional support increased with age, regardless of whether or not the closest person was their spouse. For married women, emotional support decreased dramatically for those who did not nominate their partner as their closest person.

Discussion

In this study we examined gender differences in perceived support from older adults' closest relationships. By utilizing multiple repeat measures of social support over 10 years, we investigated how men and women differed in in whom they nominate as their closest partners, the likelihood of switching their nomination, and patterns of stability and change in perceived support from close relationships as they age. Women were less likely than men to nominate their partner as their closest person, and were more likely to switch their nomination during the study period. On the whole, emotional support increased, whereas practical support and negative encounters decreased with age. Only trajectories of emotional support varied by gender, with men reporting age-related improvements while women remained stable in emotional support from close relationships. Nominating a different person had implications for trajectories of social support. Switching to a non-partner from a partner ameliorated negative encounters, but was accompanied with decreased emotional and practical support. Switching from a non-partner to a partner benefitted practical support, but at the cost of increased negative encounters. Change in the closest person was largely a detriment to emotional support for women but not for men.

These gendered trajectories in emotional support, namely, increasing with age for men and stabilizing or decreasing with age for women, remained evident amongst participants who were married throughout the study.

Our study is the first, to our knowledge, to examine change in the identity of whom one feels closest to over time. Consistent with both theory and cross-sectional studies of gender differences in close social relationships (Antonucci, *et al.* 2013), we found men to be not only more likely to nominate their spouse as their closest person, but to be also less likely to change their nomination over the 10-year study period. As the convoy theory of social support would suggest (Ajrouch, *et al.* 2005), this was in part due to differences in characteristics of the person and situation. Men were more likely than women to remain married during the study period. However, this gender difference persisted through old age and also applied to those who remained continuously married. Men also reported receiving more practical support from their closest person at baseline than women did. Through the lens of socioemotional selectivity theory, this finding is consistent with the interpretation that change in close social relationships reflects of a process of intentional selection for rewarding relationships (Carstensen, *et al.* 2003).

Our findings also demonstrate that age-related changes in support from close relationships are more pronounced among older men than women. In line with findings reported by Shaw and colleagues (2007), we found gender differences in the levels of perceived emotional support to narrow with age. This trend was driven by a substantial age-related increase in emotional support for men only. There was also evidence to suggest that age-related declines in negative encounters were slightly greater for men than women. Taken together, our results suggest that men generally benefit from the social experiences of ageing, characterized in other studies by a greater family focus for men (Arber, *et al.* 2003), and evidenced by convergence in gendered perceptions of social support (Coventry,

et al. 2004). Although men perceived more practical support at baseline than women, the trajectories of support did not vary across gender. Further, for both men and women, we observed a decline rather than increase in the level of practical support, contrary to other studies on older adults (Martire, *et al.* 1999, Shaw, *et al.* 2007). This divergence from previous evidence on trajectories of practical support may be due to differences in age composition and participant characteristics of the present cohort. Compared to previous research, the Whitehall II participants were relatively young and healthy, and therefore may be in less need of practical support.

After examining gender differences in age-related changes in social support we further examined implications of change in close social relationships on these support trajectories. An open question in research on social support in older adulthood has been whether managing close relationships is a detriment or benefit to perceived social support (Rook 2009). Change in whom one identifies as closest may reflect intentional selection, but also be an adaptation to loss. We found, for both men and women, that the switch from nominating a partner to a non-partner as the closest person was associated with a decline in both emotional and practical support, which suggests that feelings of support from a partner are not easily replaced. However, consistent with the proposal that avoiding negative relationships drives socioemotional processes (Carstensen, *et al.* 2003), switching from a partner to a non-partner was followed by decreases in negative encounters. Previous research suggests that negative encounters are more harmful than support is beneficial (Akiyama, *et al.* 2003). Identifying the longterm consequences of trading out the positive in favour of fewer negative interactions is an important avenue for future research.

The implication of changing the closest person for trajectories of social support was largely consistent across gender, except for emotional support. In contrast with our expectations, women fared worse than men in the context of nominating a new closest

person. This finding is especially surprising in light of a large body of research that shows women to have broader social networks, be more active in managing relationships, and more forthright with their emotions (Boerner, *et al.* 2014, Carstensen, *et al.* 1995). Perhaps this finding is indicative of depletion in available social resources for older women (Ajrouch, *et al.* 2005, Gray 2009), which may be particularly evident for this sample of retired white collar women who may have dedicated less time to family and friends while they were working. As for men, our findings are in agreement with the existing evidence that men with stable partnerships were in the most advantaged position (Curran, McLanahan and Knab 2003), presenting the highest initial level of emotional support which increased steadily with age. The marked improvement of emotional support in men who changed close social ties from a non-partner to a partner may imply the benefits of being in a partnership for men (Chipperfield and Havens 2001).

Several limitations of the current study should be considered when interpreting findings obtained. One limitation is the use of self-reported measures of social support, which may be influenced by respondents' personality traits (Stansfeld and Marmot 1992). Subjective experience, however, reflects individual interpretation of their social environment. Derived from a well-established questionnaire (Stansfeld and Marmot 1992), these self-rated measures are relevant indicators of social support that have established association with different health outcomes (Kouvonen, *et al.* 2011, Liao, *et al.* 2014). Second, these measures of perceived support refer to the closest person only, thus we were unable to investigate changes in social support in a more extended social network. Despite considerable consistency across different relationships (Akiyama, *et al.* 2003, Krause and Rook 2003), it should be noted that trajectories of support derived from different types of social relationships may be source-specific (Coventry, *et al.* 2004). Third, as the Whitehall II cohort is comprised predominantly of white-collar civil servants, their social relationships

may function differently, on average, from those in less affluent socioeconomic positions (Krause and Borawski-Clark 1995). Women in this occupational cohort were less likely to be married and have a child than women in the general population or their male counterparts (Stringhini, *et al.* 2011) due to gender segregation at workplace (Blake 2003). Nevertheless, our cohort covers a wide occupational spectrum with salary difference more than 10-fold between the top and bottom of the socioeconomic hierarchy. Consistent gender patterns were obtained from the restricted sample with married participants only, suggesting that differences in marital status do not confound these gendered age-trajectories of emotional support.

Through identifying gender-specific trajectories of support from close relationships over middle to early old age, this study contributes to the understanding of how social relationships evolve with age in women and men. A comprehensive understanding of social relationship transitions in late adulthood may inform intervention programs aimed to prevent social exclusion amongst our growing elderly population.

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TABLE 1. Sample description by gender (n=6,718).

	Women n =1,928	Men n =4,790	P-value ^a
Age in years - mean (SD)	56.2 (6.0)	55.7(6.0)	0.003
White (%)	88.9	94.0	<0.001
University level (%)	27.8	46.9	<0.001
High employment grade (%)	20.3	52.5	<0.001
Physical function-mean (SD)^b	48.6 (9.7)	51.8 (7.2)	<0.001
Mental function-mean (SD)^b	49.7(10.3)	51.5 (9.1)	<0.001
Married/Cohabiting (%)			
Phase 5	63.4	85.3	<0.001
Phase 7	58.7	83.4	<0.001
Phase 9	56.5	83.6	<0.001
Closest Person: Spouse/partner			
Phase 5	51.7	78.4	<0.001
Phase 7	48.6	79.5	<0.001
Phase 9	47.1	80.6	<0.001
<u>Social support measures- mean (SD)</u>			
Emotional support			
Phase 5	13.4 (4.0)	13.3 (4.2)	0.18
Phase 7	13.2 (4.1)	13.6 (4.2)	0.001
Phase 9	13.1 (4.1)	13.9 (4.2)	<0.0001
Practical support			
Phase 5	4.2 (2.6)	4.6 (2.4)	<0.0001
Phase 7	3.9 (2.6)	4.6 (2.3)	<0.0001
Phase 9	3.7 (2.6)	4.3 (2.4)	<0.0001
Negative encounters			
Phase 5	2.4 (2.1)	2.4 (1.9)	0.96
Phase 7	2.3 (2.0)	2.1 (1.8)	0.02
Phase 9	2.2 (2.0)	2.1 (1.8)	0.03

^a P-value for heterogeneity

^b Functioning score range 0-100, mean 50, higher score indicates better function.
SD: standard deviation

TABLE 2. Mean estimates and standard errors for multilevel models of support from close relationships (1997-2007) ^a

	Emotional support		Practical support		Negative encounters	
	Intercept	Slope	Intercept	Slope	Intercept	Slope
<u>Fixed effect</u>	13.94*** (0.25)	0.10*** (0.02)	5.11*** (0.13)	-0.03** (0.01)	2.21*** (0.11)	-0.04*** (0.01)
Female	0.31* (0.14)	-0.06*** (0.01)	0.19** (0.07)	0.01 (0.01)	-0.00 (0.06)	0.02* (0.01)
Always Non-partner	-3.69*** (0.20)	-0.04** (0.01)	-2.98*** (0.10)	0.01 (0.01)	-0.45*** (0.09)	0.01 (0.01)
Partner to Non-partner	-1.94*** (0.23)	-0.08*** (0.02)	-1.47*** (0.11)	-0.10*** (0.01)	0.28** (0.10)	-0.08*** (0.01)
Non-partner to partner	-1.11*** (0.24)	0.04 (0.02)	-1.33*** (0.12)	0.16*** (0.01)	0.14 (0.10)	0.08*** (0.01)
Female*Always Non-partner	1.52*** (0.23)	0.02 (0.02)	0.02 (0.12)	-0.01 (0.01)	-0.06 (0.10)	-0.02 (0.01)
Female*Partner to Non-partner	0.64 (0.37)	0.01 (0.03)	-0.01 (0.18)	-0.02 (0.02)	0.16 (0.16)	0.02 (0.02)
Female*Non-partner to partner	-0.15 (0.43)	-0.12** (0.04)	-0.30 (0.21)	-0.02 (0.02)	0.12 (0.18)	-0.02 (0.02)
Birth cohort	0.03** (0.01)	0.00 (0.00)	-0.03*** (0.00)	-0.00*** (0.00)	-0.02*** (0.00)	-0.00 (0.00)
Non-white	0.39* (0.17)	0.01 (0.02)	0.20* (0.09)	0.00 (0.01)	0.87*** (0.08)	0.01 (0.01)
Married/cohabiting	0.23 (0.17)	0.06*** (0.02)	0.11 (0.09)	0.00 (0.01)	0.08 (0.07)	-0.02* (0.01)
No formal education	-0.08 (0.17)	-0.02 (0.02)	-0.09 (0.09)	-0.01 (0.01)	-0.00 (0.07)	0.00 (0.01)
Low employment grade	-0.03 (0.18)	-0.02 (0.02)	0.29** (0.09)	0.01 (0.01)	0.04 (0.08)	0.01 (0.01)
Physical function	0.01* (0.01)	-0.00 (0.00)	-0.03*** (0.00)	0.00 (0.00)	-0.02*** (0.00)	-0.00 (0.00)
Mental function	0.03*** (0.00)	-0.00 (0.00)	-0.01* (0.00)	-0.00 (0.00)	-0.05*** (0.00)	0.00*** (0.00)
<u>Random effect</u>						
Intercept Variance	8.66 (0.01)		1.82 (0.05)		1.33 (0.04)	
Slope Variance	0.01 (0.002)		0.003 (0.001)		0.001 (0.00)	
Covariance Intercept*Slope	0.01 (0.01)		0.01 (0.003)		-0.004 (0.002)	
Residual Variance	5.99 (0.10)		2.54 (0.04)		1.82 (0.03)	
<u>Model fit statistics</u>						
-2log-likelihood	91193.0		72845.6		66789.2	
Akaike information criterion	91276.9		72929.6		66873.2	
Bayesian information criterion	91603.0		73255.7		67199.2	

^a Mean estimations are in reference to aged 60 (intercept), male, white, always nominated partner as the closest person, had a university degree and in a high employment grade; standard errors in parentheses

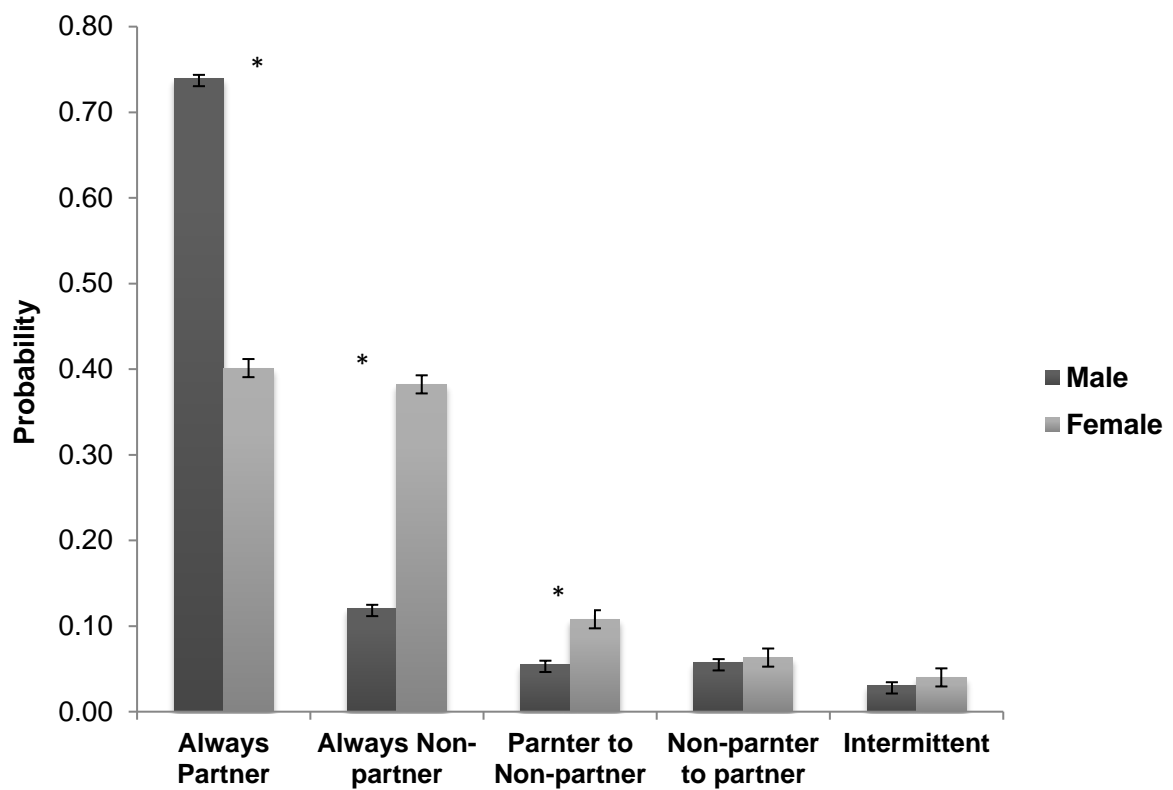


Figure 1. Gender-specific probability of stability and change in close relationships, conditional on socio-demographic and health status (* statistically significant gender differences; error bars represent 95% confidence interval; non-partner: those who nominated relatives or friends; intermittent: those who changed between partner and non-partner more than once).

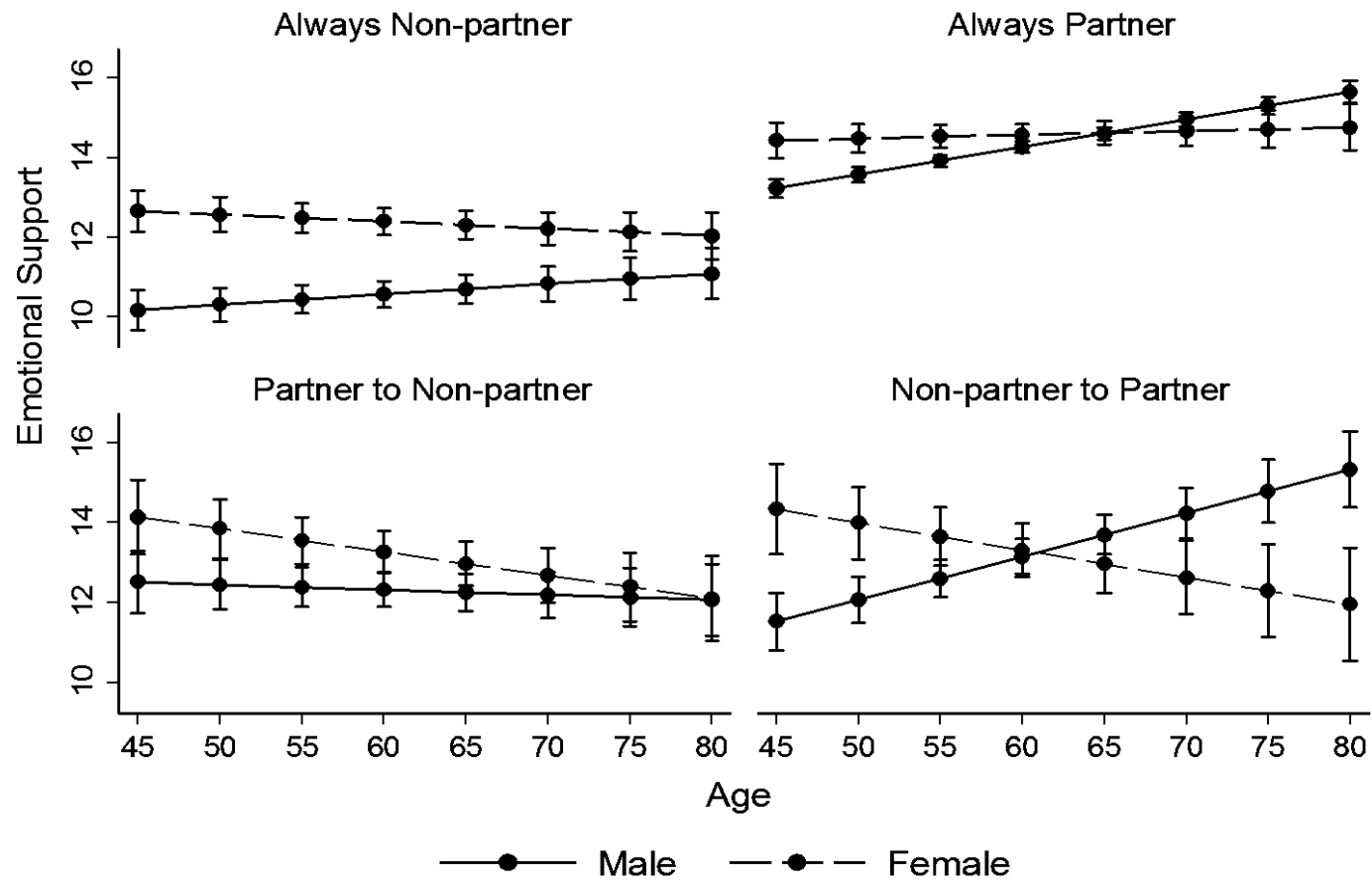


Figure2. Gender-specific emotional support trajectories (range 0-21) by stability and change in close relationships, with standard error bars; controlled for ethnicity, birth cohort, education, employment grade, health status, and time-varying marital status. Trajectories among those with intermittent close relationships not shown

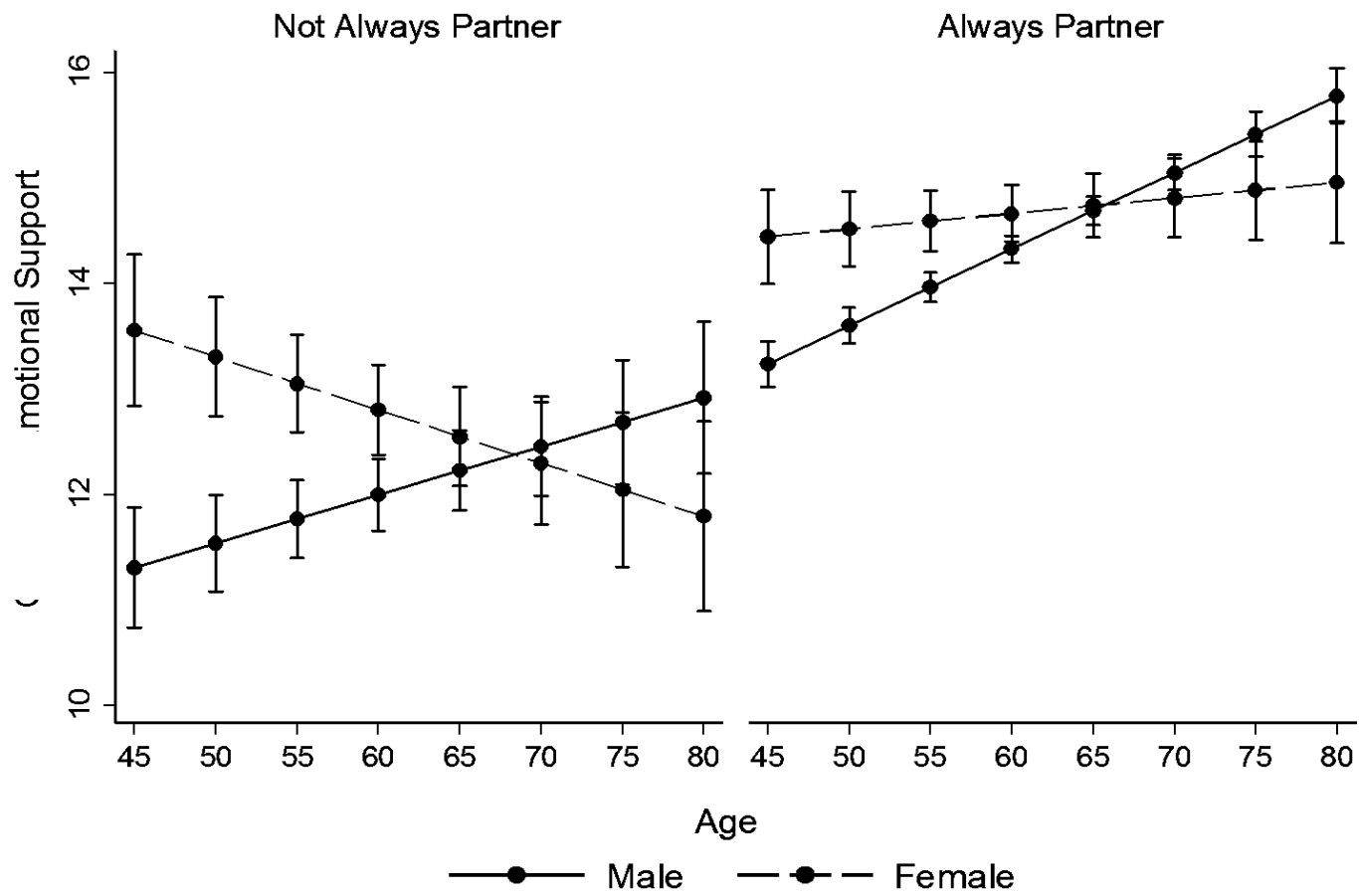


Figure3. Gender-specific emotional support trajectories (range 0-21) by source of close relationships among always married participants, with standard error bars; controlled for ethnicity, birth cohort, education, employment grade and health status.