

Perspectives on Socioemotional Selectivity in Late Life: How Personality and Social Context Do (and Do Not) Make a Difference

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This research extends earlier cross-sectional findings suggesting that although social network sizes were smaller in very old age as compared to old age, the number of emotionally close relationships in the network did not distinguish age groups. In a representative sample of community dwelling and institutionalized adults, aged 70 to 104 years, we explored whether such indication of socioemotional selectivity was related to personality characteristics and family status. Extraversion, Openness to Experience, and Neuroticism as assessed by the NEO-PI were related to overall network size but unrelated to the average emotional closeness of social partners in the network (i.e., our indicator of socioemotional selectivity). Family status, in contrast, was related to average emotional closeness to network members. Moreover, family status moderates the relationship between average emotional closeness to network members and feelings of social embeddedness. Findings suggest a stronger influence of contextual rather than personality factors on social functioning in late life.

OVER the life course, people face social and personal markers that heighten the realization that life is finite. Grown children leave home, children and grandchildren are born, the experience of personal losses like widowhood or death of close friends, as well as functional limitations like visual impairment or increased physical vulnerability provide gentle and not-so-gentle reminders of human mortality.

Socioemotional selectivity theory (Carstensen, 1993, 1995) contends that when people construe the future as limited, preferences for social partners shift increasingly from ones that are directed toward achieving long-range goals in social relationships (e.g., educational ambitions) to more short-term goals (e.g., emotional gratification). That is, people who perceive time to be “running out,” pursue social goals that are associated with immediate benefits. Simultaneously, long-term goals become less salient in choosing social contact partners. According to the theory, short-term social goals tend to be focused on emotional aspects of relationships. Because meaningful emotional states are more easily and reliably obtained in interactions with close social partners, these social partners are preferred over social partners who are not close. Carstensen and her colleagues have demonstrated that limited future orientation is associated with social preferences for emotionally close partners (Fredrickson & Carstensen, 1990), the enhanced salience of emotion in memories about social interactions (Carstensen & Turk-Charles, 1994).

Evidence that the emotional significance of social relationships is relevant to social functioning in late life is also apparent in the composition of social networks. Even though the overall size of social networks declines in later life (Harvey & Singleton, 1989; Lee & Markides, 1990), aging peo-

ple maintain close relationships with significant others well into their nineties (Antonucci & Akiyama, 1987; Field & Minkler, 1988). Moreover, the smaller social networks that older people have include emotionally close relationships and are associated with strong feelings of social embeddedness (Lang & Carstensen, 1994). Such findings are consistent with the contention that selectivity in social contact is an important part of adaptive functioning in the social domain (Carstensen, 1993, 1995; Carstensen & Lang, 1997; Lang & Carstensen, in press). Moreover, there is much evidence suggesting that social embeddedness is predictive of enhanced adaptivity and prolonged life expectation (cf. House, Landis, & Umberson, 1988). However, the factors that influence social selectivity and its adaptiveness in later life remain largely unexplored. At least two types of influences are relevant in this vein, namely, (a) the social context of social functioning and (b) personality characteristics that are associated with particular social behaviors.

Social Contextual Influences and Social Adaptation

From a life-span perspective, adaptational processes are bound to specific contextual conditions. This means that the social contextual opportunities available to older people should influence the adaptiveness of certain social patterns. For example, in cases where older people have nuclear family members such as a spouse or an adult child, goals related to emotional meaning and social connectedness may be easily realized. Nuclear family members appear to be extremely important social and emotional resources for older adults, providing both emotional and instrumental support (Dykstra, 1993; Hogan, 1995). This is not to say that nuclear family members provide uniformly positive

emotional rewards nor that they are the sole emotional resource. On the contrary, close family relationships can cause considerable distress (Carstensen, Gottman, & Levenson, 1995; Rook, 1984; Pillemer & Suito, 1991) and other kin relationships, for example, with siblings (Connidis & Davis, 1992) or relationships with friends can be very meaningful (Dykstra, 1993; Rook, 1989). However, the availability of nuclear family members very likely facilitates feelings of social embeddedness irrespective of actual social contact and support exchange (Wills, 1985). Thus, we expect that when older people do not have nuclear family members available, having a larger proportion of emotionally close relationships in the social network (i.e., socioemotional selectivity) is even more closely associated with stronger feelings of social embeddedness.

In 1994, Lang and Carstensen reported cross-sectional findings from the Berlin Aging Study (BASE) suggesting that although age cohort was associated with smaller social networks, the proportion of emotionally close relationships in the network did not distinguish age groups. Consequently, the resulting social profile was one in which the average level of emotional closeness to social network members was greatest in very old age. It is interesting to note that older people who displayed this prototypical pattern also indicated relatively strong feelings of social embeddedness pointing to the apparent adaptiveness of emotionally condensed social networks in later life.

However, in our earlier study we also found evidence that the effect-size of the association between the average emotional closeness to social network members and feelings of social embeddedness differed depending on older individuals' specific social relational contexts: When nuclear family members (i.e., spouse and adult children) were unavailable, the correlation between the average emotional closeness to network members and subjective feelings of social embeddedness was even stronger than when nuclear family members were available. In the present study, a replication of these findings is tested in an independent and larger sample. The replication part pertains to effects of age cohort on network composition and in differential associations between average emotional closeness and feelings of social embeddedness within two groups of family status. We suspect that a spouse and adult children — if available — may be perceived by older people as more dependable social resources compared to other relatives or friends (e.g., Dykstra, 1993). Hence, an older individual who has nuclear family members may be less dependent on other very close relationships in order to satisfy emotional needs. However, differences in social selectivity and its association with feelings of social embeddedness might not only reflect differences in family status but also interindividual differences in personality, which in turn might be related to different social relationship patterns across the life span (Antonucci & Jackson, 1987; Caspi, 1987). Therefore, personality characteristics are included in an extension of the earlier study as a second potential source of influence on social selectivity in late life.

Personality Characteristics and Social Selectivity

Personality characteristics have been associated with well-being (e.g., Diener, Sandvik, Pavot, & Fujita, 1992),

social satisfaction (Henderson, Byrne, & Duncan-Jones, 1981) and quantitative properties of social networks, such as network size, social contact frequency, and level of social activity (e.g., Krause, Liang, & Keith, 1990; Watson, Clark, McIntyre, & Hamaker, 1992; Zautra, Finch, Reich, & Guarnaccia, 1991). For example, research based on younger populations has shown that Extraversion correlates positively (viz., between .20 and .43) and Neuroticism correlates negatively (viz., between $-.05$ and $-.24$) with number of close relationships (Costa, Zonderman, & McCrae, 1985; Henderson et al., 1981). Neuroticism and Extraversion have also been associated with conflict in marital relationships (Buss, 1991) and a heightened risk of marital dissolution (Cramer, 1993; Kurdek, 1991). Not much is known about associations between social network and Openness to Experience. There is some indication that Openness to Experience is positively associated with the number of meaningful relationships in the social network (Feichtinger, Laireiter, Untner, & Baumann, 1992).

Given that these personality dimensions appear to remain stable throughout adulthood (Costa & McCrae, 1994), social relational contexts in late life may come to be associated with personality characteristics over time. It is therefore important to explore whether or not indicators of socioemotional selectivity are reflections of individual differences rather than more general adaptive mechanisms. If they are reflections of individual differences, people who are extraverted and more open to new experiences might be less likely than others to prefer and to benefit from a large proportion of emotionally close social partners in their social network. If they are not, though, a large proportion of emotionally close social partners in the network (as an indicator of socioemotional selectivity) would contribute to social embeddedness regardless of their specific personality characteristics. This is based on the idea that adaptive mechanisms such as social selectivity operate in similar ways across different personality characteristics and social contexts (Marsiske, Lang, Baltes, & Baltes, 1995).

Examining socioemotional selectivity as a function of personality characteristics and social contexts, thus, allows for a test of the generality of socioemotional selectivity. For example, if extraverts and introverts as well as more neurotic and less neurotic persons report social networks that are characterized by a high prevalence of emotionally close social partners it suggests that selectivity can be observed irrespective of their dispositional styles. Further, if mechanisms of socioemotional selectivity and their association with feelings of social embeddedness differ by social contexts even after personality differences have been accounted for, it supports the contention that socioemotional selectivity reflects a context-specific adaptive mechanism in social functioning (Cantor & Fleeson, 1994) as opposed to the influence of individual differences in personality characteristics.

In this article, we examine the associations between age cohort, family status, average emotional closeness to social network members (as an indicator of socioemotional selectivity), personality dimensions, social network size and feelings of social embeddedness. More concretely, we expect differences in the association between feelings of social embeddedness and average emotional closeness to network

members according to family status, whereas no such differential associations are expected for personality characteristics. Specifically, we test the following three hypotheses.

The first hypothesis reflects our aim of replicating findings from our earlier study. Using a cross-validation sample from the BASE, we hypothesize that age cohort is related to a reduction in overall network size while, at the same time, the number of *very close* emotional partners is unrelated to age cohort. Consequently, we predict that, on average, emotional closeness to others is positively associated with age cohort. The second and third hypotheses extend our perspective to influences of personality characteristics and social context factors (such as family status) on the level of emotional closeness to network members as an indicator of socioemotional selectivity. We hypothesize that personality characteristics such as Extraversion and Openness to Experience are positively associated with social network size even in very old age, whereas the average level of emotional closeness to network members is unrelated to these personality characteristics. Third, we hypothesize that the average level of emotional closeness to network members and feelings of social embeddedness are more strongly correlated (in the positive direction) when nuclear family members are available than when they are not.

METHOD

Participants

In the Berlin Aging Study, 516 community-dwelling and institutionalized West-Berlin residents aged 70 to 104 years took part in an intensive 14-session interview, which represented a collaborative effort of four disciplines: psychology, sociology, psychiatry, and internal medicine (see Baltes, Mayer, Helmchen, & Steinhagen-Thiessen, 1993). Of the total sample ($N = 516$), 360 participants (Mean age = 84.9 years, $SD = 8.5$) were used to *cross-validate* our earlier findings (Lang & Carstensen, 1994) based on a subsample of 156 participants. All other analyses were based on the entire sample ($N = 516$).

Participants were identified through probability sampling from the local registration office (in Germany each citizen must be registered), stratified by age and sex. Twenty-seven percent of those contacted took part in all 14 sessions of BASE. In an analysis of representativeness of the final BASE sample compared to the contacted sample of 1,908 older people, Lindenberger, Gilberg, Poetter, Little, and Baltes (1996) did not find substantial evidence for sample biases. However, there was indication that the final sample had a lower mortality rate after one year (5.4%) compared to the general population (13.5%).

Of the 516 participants, 378 (73.3%) had living nuclear family members. One hundred and thirty eight participants (26.7%) had neither a spouse nor a child available in their social network. Having nuclear family members was confounded with age cohort, gender, years of education, and living arrangements. Overall, those participants without nuclear family members were significantly older ($M = 88.2$, $SD = 8.4$) than those who had a spouse and/or at least one child, $M = 83.7$, $SD = 8.4$, $F(1,359) = 28.6$, $p < .001$, in their network. Women were more likely (37.6%) than men

(15.9%) to be without nuclear family members ($\chi^2 = 30.0$, $df = 1$, $p < .001$). Participants with nuclear family members had 11 years of education ($SD = 2.4$) compared to 10.2 years ($SD = 2.0$) of participants without nuclear family members, $F(1,514) = 11.0$, $p \leq .001$. Of those without nuclear family members, 65.2% lived alone and 28.3% were institutionalized. Participants who had living nuclear family members were most likely to live in shared households (45.2%) or to live alone (46.3%; $\chi^2 = 79.3$, $df = 2$, $p < .001$).

Measures

Family status. — The availability of nuclear family members, that is a spouse or adult children, was assessed within a biographical interview on family relationships across the life span (Lang & Carstensen, 1994). Two groups of family status were differentiated: (a) Those who had either a living spouse or an adult child available ($n = 378$), and (b) those participants who had neither a spouse nor an adult child available in their social network ($n = 138$), either because they were divorced or never married and childless ($n = 44$), or because they were widowed and have survived or lost contact with their children ($n = 94$).

Social network size. — Social networks were assessed with a modified version (Lang, 1996) of the Social Convoy Questionnaire developed by Kahn and Antonucci (1980) that consists of a free-recall name-generating technique using the circle diagram described below. On average, participants reported 11.0 social relationships ($SD = 7.2$; $min/max = 0/50$).

Emotional closeness. — Emotional closeness of each social relationship was assessed using a set of three concentric circles grouped around a small circle in which the German word *Ich* (*I*) was written. The inner circle represents network members to whom the participant “feels very close, so close that it would be hard to imagine life without.” The middle circle refers to those network members to whom the participant does “not feel quite so close compared to those in the inner circle, but who are still very important.” The outer circle lists those network members, to whom the participant “feels less close, but who are still important.” When naming additional social partners related to particular functions (e.g., supporters or social companions), participants were asked whether these new partners should be classified into one of the circles. If participants declined, these social partners were classified as not close, that is, distant supporters (e.g., formal helpers) or support-receivers. Otherwise, they were assigned a score matching the circle in which they were placed. Thus, a 4-point scale resulted indicating the degree of emotional closeness with each network partner on which 3 = *very close*, 2 = *not quite so close*, 1 = *less close*, and 0 = *not close at all*.

Average emotional closeness to social network members was computed as the grand mean of the emotional closeness indicated for each member of a participant’s social network. The resulting index was standardized and transformed into T scores ($M = 50$; $SD = 10$). Note that the average emotional closeness to network members is statistically unrelated to network size ($r = .01$).

Personality measures. — Participants completed an 18-item German adaptation (Borkenau & Ostendorf, 1990; see also Smith & Baltes, 1996) of the NEO Personality Instrument (Costa & McCrae, 1985). Six items measured each of three personality dimensions, that is, Neuroticism, Extraversion, and Openness to Experience. Participants rated the degree to which each of the items described themselves on a 5-point scale. Internal consistency reached an Alpha coefficient of .75 for the Neuroticism subscale, .64 for the Extraversion subscale and .56 for the Openness to Experience subscale. Because items for the Openness to Experience subscale showed considerable skewness, items were transformed by the natural logarithm before analyses were conducted.

Feelings of social embeddedness in the social network were measured by a composite index (Lang & Carstensen, 1994) consisting of social satisfaction, as measured by three items (i.e., satisfaction with friends, satisfaction with family, general satisfaction with relationships; $\alpha = .66$), exchange of tenderness with social partners, as measured by two items (i.e., hugs and kisses received and given; $\alpha = .82$), plus social loneliness ($\alpha = .76$) and emotional loneliness ($\alpha = .71$) as measured by a German version of the UCLA Loneliness Scale (Russell, Cutrona, Rose, & Yurko, 1984; Smith & Baltes, 1996). The composite index of feelings of social embeddedness was constructed from the unit-weighted factor scores of the four subdimensions ($M = 8.4$, $SD = 2.9$, $min/max = 1/16$) explaining 54.6% of the total variance in these subdimensions. Internal consistency of the social embeddedness measure as indicated by Cronbach's alpha was .72.

RESULTS

Results are presented in two sections. The first describes the cross-validation of the present findings with those from Lang and Carstensen (1994). In the second section, analyses are extended to an investigation of the potential moderating influences of family status and personality dimensions on the relationship between feelings of social embeddedness and average emotional closeness to network members (as an indicator of socioemotional selectivity).

Cross-Validation of Socioemotional Selectivity in Old Age

Age and network size. — There was a significant negative correlation ($r = -.35$; $N = 360$) between total network size and age. This correlation was nearly identical to the correlation coefficient reported by Lang and Carstensen (1994; $r = -.37$; $Z = 0.2$; $p > .50$; see insert in Figure 1).

Consistent with Lang and Carstensen (1994), the inverse association between network size and age appears to be accounted for primarily by declines in the number of network members who were least close to the participant. Figure 2 shows fitted regression lines for age cohort on network size representing the four levels of emotional closeness. For comparison purposes an insert illustrating the findings from Lang and Carstensen (1994) is included. Not only are the correlations in both studies highly similar, there are also remarkable distribution similarities (even in outliers). Figure 2 shows that there was a small negative

association between age and number of very close emotional relationships. Given the large sample size, the correlation ($r = -.15$) is significant — in contrast to Lang and Carstensen (1994), but the effect size is very small ($\eta^2 = 2.3\%$) and nearly identical to the original finding ($r = -.12$; $\eta^2 = 1.4\%$; $Z = 0.3$; $p > .50$). In addition, when controlling for family status, the correlation between the number of *very close* emotional relationships and age disappears ($b = -.03$; $p = .51$), whereas the correlation between *close* relationships (i.e., those named in the middle circle) and age remains significant ($b = -.15$, $p < .01$) as does the correla-

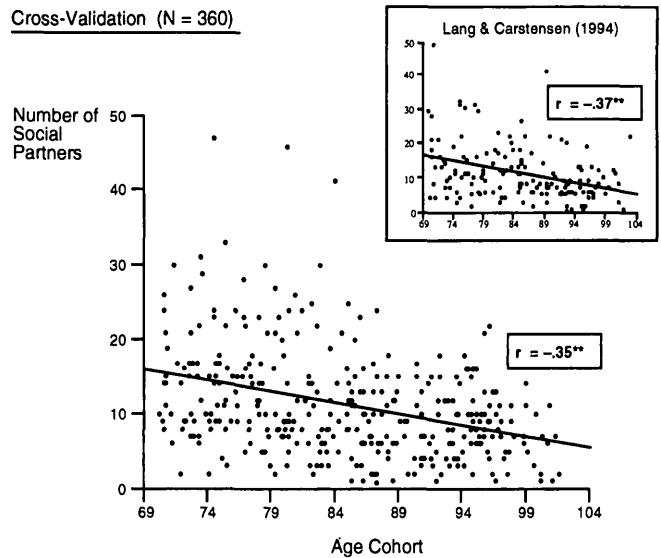


Figure 1. The number of social partners as a function of age. Note: The insert allows comparison of the distribution reported by Lang and Carstensen (1994).

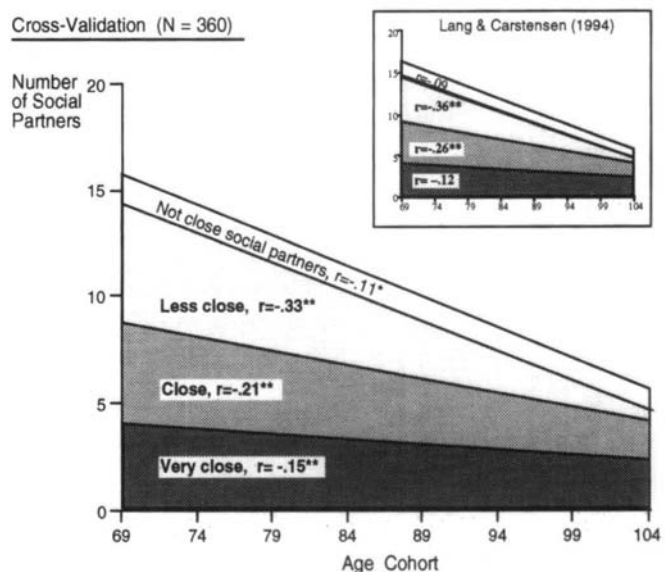


Figure 2. The number of less close social partners is more strongly and negatively related to age than is the number of close and very close social partners.

tion between *less close* relationships and age ($b = -.30, p < .001$). It is important to note that among old people who had nuclear family, the inner circles included predominantly kin relationships ($M = 92.1\%$; $SD = 23.0$), whereas among those without nuclear family members only 31.4% ($SD = 43.4$) of very close emotional partners were kin, $F(1,356) = 268.4, p < .001, \eta^2 = 40.8\%$.

Figure 2 also shows that although the number of social partners in all three circles is negatively related to age, the number of less close social partners (i.e., those named in the outer circle; $M = 3.2$; $SD = 2.9$) is more strongly (and negatively) related to age ($r = -.33$) than is the number of close ($M = 3.4, SD = 3.2$; $r = -.21$; $Z = 2.3$; $p < .05$) and very close social partners ($M = 3.1, SD = 3.3$; $r = -.15$; $Z = 2.9$; $p < .01$). The number of social partners who were “not close” (i.e., not named in the circle diagram at all) but named as supporters, support-receivers, or social companions ($M = 1.2, SD = 1.8$) was also significant and negatively related to age ($r = -.11, p < .05$).

Because the outer circles contained predominantly nonkin relationships, one possible explanation for the apparent age-related differences of social partners in the outer circle was that age-peers were more likely to die than younger family members who were more likely to be located in the inner circles of participants protocols. The mean percentage of social partners aged over 75 years in the outer ($M = 21.7\%$, $SD = 32.2$) and middle ($M = 19.3\%$, $SD = 29.5$) circles combined was higher than in the inner circle ($M = 13.7\%$, $SD = 27.0$; $t = -3.7, p < .01$). However, the size of this effect was quite small ($\eta^2 = 2.0\%$) compared to effect sizes of age on the number of persons in the outer circle ($R^2 = 11.2\%$) and in the middle circle ($R^2 = 4.2\%$). When the age of social partners was held constant all reported correlations between chronological age of participants and number of partners named in the middle and outer circles remained essentially unchanged.

Do Personality and Social Context Make a Difference?

Univariate associations among variables. — As predicted, Extraversion correlated positively with the size of the social network ($r = .26, p < .01$) and accounted for 6.7% of the variance in network size. Extraversion did not systematically vary, however, with the average level of subjective emotional closeness to network members ($r = -.01, n.s.$). These two correlation coefficients differed significantly from one another ($Z = 4.51, p < .01$). Similarly, Openness to Experience correlated positively with the overall social network size ($r = .17, p < .01$), whereas there was no systematic variation with average emotional closeness ($r = -.02, n.s.$). Again, correlation coefficients differed significantly from each other ($Z = 3.12; p < .01$). Figure 3 illustrates the regression slopes of overall network size and average emotional closeness to network members in each of the three personality dimensions, Extraversion, Neuroticism, and Openness to Experience.

In contrast, Neuroticism correlated negatively with both social network size ($r = -.10, p < .05$) and average emotional closeness to network members ($r = -.10, p < .05$, see Figure 3). The two correlation coefficients were nearly

identical ($Z = -0.07, p > .50$). This means that, compared to more neurotic participants, less neurotic participants had larger social networks with a relatively higher average level of emotional closeness to network members.

Moreover, as expected, a small and positive correlation ($r = .09, p < .05$) of average emotional closeness with age was confirmed. A similar pattern was revealed in relation to general intelligence (Lindenberger & Baltes, 1994). General intelligence correlated positively with social network size ($r = .49, p < .001$), but was slightly negatively associated with average emotional closeness of social partners ($r = -.12, p < .01$). There were also clear differences in social network size and average level of emotional closeness to network members between participants who did and who did not have nuclear family members. Those participants who had nuclear family reported a higher average level of emotional closeness ($M = 1.5, SD = 0.5$) and larger social networks ($M = 12.2, SD = 7.4$) than those participants without nuclear family. Average emotional closeness: $M = 1.2, SD = 0.7$; $F(1,514) = 27.0, p < .001, \eta^2 = 5.0\%$; Social network size: $M = 7.9, SD = 5.6$; $F(1,514) = 38.3, p < .001, \eta^2 = 6.9\%$. None of the correlations of personality variables with social network size and with average emotional closeness was significantly different between the two groups.

Finally, participants with and without nuclear family members did not differ significantly with respect to Extraversion, $F(1,512) = 0.0, p = .83$, and Openness, $F(1,512) = 0.2, p = .65$, although there was a small significant effect of Family Status on Neuroticism, $F(1,512) = 4.6, p < .05; \eta^2 = 0.9\%$. Participants who had nuclear family were less neurotic than those who did not have nuclear family.

Hierarchical regression analyses predicting average emotional closeness to social network members. — We computed three hierarchical multiple regression analyses in order to test our third hypothesis. The relative predictive power of feelings of social embeddedness, personality characteristics, and family status with regard to the average emotional closeness was examined after controlling statistically for network size and sociodemographic variables such as gender, living arrangements and education.

To identify the unique variance contributed by feelings of social embeddedness, family status, and personality characteristics on the average level of emotional closeness to network members, we computed three hierarchical models (see Table 1).

As can be seen in Table 1, when Extraversion, Neuroticism, and Openness to Experience were entered after sociodemographic variables into the equation (Model 1) they explained a nonsignificant 0.8% of the variance of Average Emotional Closeness To Network Members ($p = .21, ns$). Family Status was positively associated with average emotional closeness to network members (accounting for additional 4.1% of the variance) even after controlling for personality and feelings of embeddedness. That is, participants without nuclear family members reported lower levels of emotional closeness to network members (residualized values: $M = 46.6; SD = 11.8$) than participants who had nuclear family members (residualized values: $M = 51.3; SD = 8.4$).

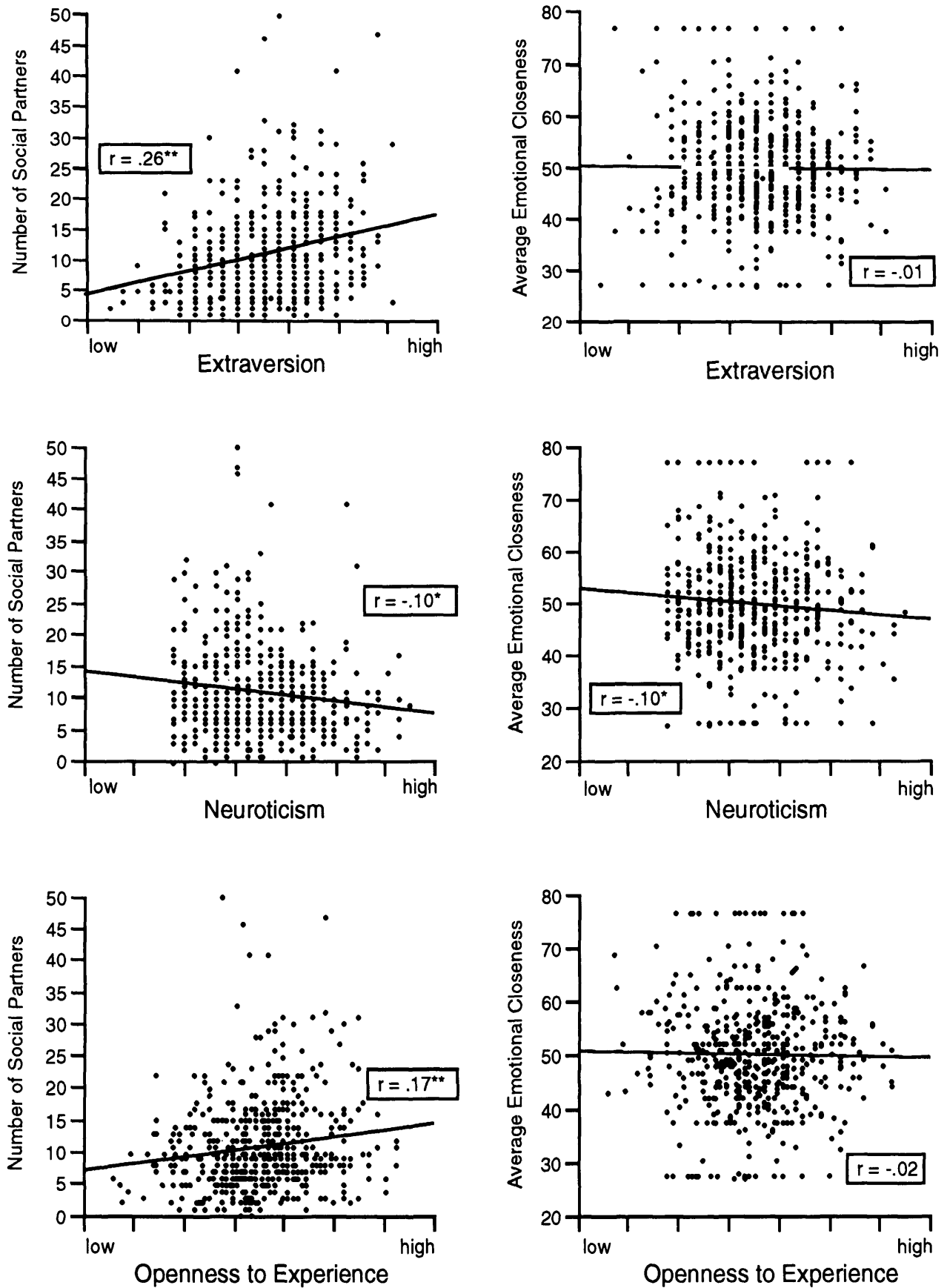


Figure 3. Extraversion and Openness to Experience are related to Network Size but not to the Average Emotional Closeness to Network Members. Neuroticism is negatively related to both Network Size and Average Emotional Closeness ($N = 516$).

Table 1. Three Hierarchical Regression Models Predicting Average Emotional Closeness to Network Members ($N = 516$)

Step / Effect	Model 1		Model 2		Model 3	
	Personality First		Feelings of Embeddedness First		Family Status First/ Interaction Terms	
	R^2	ΔR^2	R^2	ΔR^2	R^2	ΔR^2
1 Control variables						
Age	0.8	0.8*	0.8	0.8*	0.8	0.8*
Gender	0.9	0.1	0.9	0.1	0.9	0.1
Institutionalization	0.9	0.0	0.9	0.0	0.9	0.0
Network size	1.6	0.6	1.6	0.6	1.6	0.6
Education	2.0	0.4	2.0	0.4	2.0	0.4
2 NEO-PI ¹	2.8	0.8				
3 Feelings of social embeddedness	6.4	3.5***				
4 Family status ²	10.5	4.1***				
2 Feelings of social embeddedness			6.0	4.1***		
3 Family status ²			10.2	4.2***		
4 NEO-PI ¹			10.5	0.3		
2 Family status ²					7.1	5.1***
3 NEO-PI ¹					7.9	0.8
4 Feelings of social embeddedness					10.5	2.6***
5 Family Status \times Embeddedness					13.5	3.0***
6 NEO-PI ¹ \times Family Status					13.8	0.3
7 NEO-PI ¹ \times Embeddedness					14.8	1.0
8 NEO-PI ¹ \times Family Status \times Embeddedness					15.0	0.2

Note: Inconsistencies between R^2 and sum of ΔR^2 are due to rounding to decimal places.

¹NEO-Personality Inventory (NEO-PI), that is, Extraversion, Neuroticism, and Openness to Experience were entered into the equation in one block.

²Family Status, where 1 is with and 0 is without nuclear family members available.

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

Note that the homogeneity of variances in the average emotional closeness measure according to an F_{\max} criterion of 1.4 is acceptable (see Tabachnik & Fidell, 1996).

In Model 2, Feelings of Social Embeddedness was entered after control variables into the equation contributing 4.1% to the explained variance. Extraversion, Neuroticism, and Openness to Experience, when entered last, did not add significantly to the equation. When Feelings of Social Embeddedness was entered last into the equation of Model 3, the additional variance explained remained fairly stable at 2.6%. The personality variables, again, failed to explain a significant amount of the variance (0.8%). When sociodemographic variables, age and network size were not controlled, all reported effects remained essentially unchanged.

Finally in Model 3, all interaction terms between personality, feelings of embeddedness and family status were entered into the regression equation. As we predicted, the two-way interaction effect of Family Status and Feelings of Social Embeddedness explained a significant 3.0% of the variance. None of the remaining two-way and three-way interaction effects between personality variables and family status or feelings of social embeddedness contributed significantly to the explained variance. Interestingly, however, we found a two-way interaction of family status and network size on the average emotional closeness to network members that added 1% of explained variance: Network size and average emotional closeness were *negatively* associated among participants with nuclear family members ($r = -.17, p < .01$), but

correlated *positively* among participants without nuclear family members ($r = .19, p < .01; Z = 3.63, p < .01$).

Findings suggest that socioemotional selectivity as indicated by the average emotional closeness to network members is not related to personality and that the relationship between average level of emotional closeness and feelings of social embeddedness is not moderated by personality variables. It is moderated, however, by social context (i.e., family status). Figure 4 displays the residualized values of average emotional closeness as a function of feelings of social embeddedness separately for old people with and without nuclear family members after statistically controlling for sociodemographic variables and network size.

Feelings of social embeddedness in both groups are positively associated with average emotional closeness to network members. Among participants without nuclear family, however, we found significantly higher correlations of average emotional closeness with feelings of social embeddedness than among those who had nuclear family members. Note that although participants who had nuclear family reported somewhat stronger feelings of social embeddedness ($M = 9.0, SD = 2.8$) than participants without nuclear family members ($M = 7.2, SD = 3.0$), homogeneity of variances could be confirmed even according to the relatively strict Bartlett-Box Test, $F(1,421215) = 1.1, p > .25; F_{\max} = 1.1$. Among those participants without nuclear family members, the childless and never-married participants did not differ from those participants who were widowed or had lost their

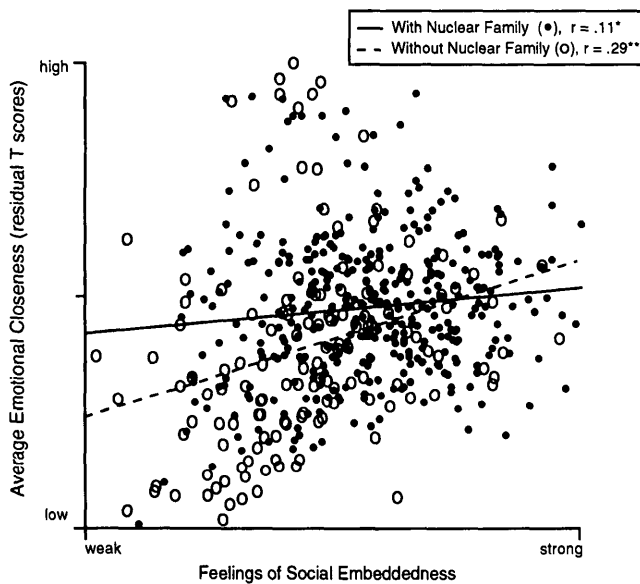


Figure 4. Average Emotional Closeness To Network Members is more strongly associated with Feelings of Social Embeddedness among old people who do not have nuclear family than among those with nuclear family (Average emotional closeness after residualizing on control variables, see Table 1; $N = 516$). $*p < .05$; $**p < 0.1$.

children prematurely with respect to age, $F(1,136) = 3.1$, *ns*, average level of emotional closeness, $F(1,136) = 1.4$, *ns*, feelings of social embeddedness, $F(1,136) = 2.1$, *ns*, or size of social network, $F(1,136) = 0.2$, *ns*. Moreover, all reported effects remained stable when excluding those participants who were never-married and childless and those participants who were widowed or had prematurely lost their children.

DISCUSSION

In the present study, we examined the extent to which socioemotional selectivity as indicated by the average level of emotional closeness to social network members is related to personality and social contextual factors. On the whole, findings confirmed our hypotheses. First, we replicated the finding that emotionally condensed social networks (i.e., social networks characterized by high levels of average emotional closeness to network members) are prototypical in very old age (cf. Lang & Carstensen, 1994). Second, as predicted, personality characteristics are related to the size of social networks but are for the most part unrelated to the average level of emotional closeness to network members. Regardless of individual differences in Extraversion, Neuroticism or Openness to Experience, social networks are more emotionally condensed among very old participants as compared to old participants. Third, feelings of social embeddedness as well as family status are related to the average emotional closeness to network members. In addition, the strength of the association between social embeddedness and average emotional closeness differs depending on family status and, once again, this is independent of personality characteristics.

Personality was found to be related to the size of social networks. Although the association between personality

and network size is frequently presumed in the personality literature, it has only rarely been investigated empirically (cf. Morgan, 1990). Our findings suggest that even in the ninth decade of life, extraverts have larger social networks than introverts (see also Costa et al., 1985; Henderson et al., 1981; Stokes, 1985). We also found a positive correlation between network size and Openness to Experience. Because our sample is quite old, compared to other samples described in the literature (Feichtinger et al., 1992), this finding suggests that very old people who are sociable, upbeat, energetic, appreciative of new experiences and who have a tolerance for the unfamiliar are more likely to maintain larger social networks than very old people who are less open to experience.

Personality, however, is less relevant to average levels of emotional closeness than it is to social network size. Except for a small effect of Neuroticism, personality characteristics are not associated with the average emotional closeness to network members. Moreover, irrespective of Neuroticism, Extraversion or Openness to Experience, social networks of people who are in their nineties are characterized by a greater average emotional closeness than networks of those elder people who are still in their seventies or eighties. Although extraverts appear to have generally larger networks than introverts, this personality dimension does not appear to influence the average emotional closeness to others in later life. Thus, the present findings suggest further evidence for a general age/cohort-related mechanism in the social domain and also underscore the enduring role of personality into very old age. In this way, they offer a union of sorts between two literatures that are often seen as "at odds" with one another.

A second major focus of this research was on the relationship of social-contextual resources and socioemotional selectivity (as indicated by the average emotional closeness to network members). It has been argued that in later life individuals are increasingly depleted of personal (i.e., internal) resources such that the availability and use of external and social resources assumes even greater importance for adaptive functioning (cf. Baltes & Baltes, 1990; Baltes & Carstensen, 1996; Lawton, 1989; Staudinger, Marsiske, & Baltes, 1995). Thus, the actual social contexts in which older people find themselves in late life offer both opportunities and demands that require context-specific adaptive efforts on their part.

In particular, we found that the availability of nuclear family is related to both network size and average emotional closeness to network members. The social networks of older people who had nuclear family tended to be larger and more emotionally condensed than the social networks of people who did not have nuclear family. This finding is important when interpreting the interaction effect of family status and feelings of social embeddedness on social selectivity in late life. Namely, the association between social embeddedness and average level of emotional closeness to others is stronger among older people without nuclear family than among older people with nuclear family members. Moreover, feelings of social embeddedness are generally stronger among those who have nuclear family members as compared to those who do not have nuclear family. The avail-

ability of nuclear family members (Wills, 1985) contributes to feelings of social embeddedness whereas the emotional closeness with other social partners seems to be less relevant when a spouse or an adult child is available. This notion is underscored by the finding that when old people have nuclear family members available to them, the average emotional closeness to network members is negatively associated with social network size. It may also be the case that, for those people who have a spouse or child available, the quality of these specific relationships influences feelings of social embeddedness more so than the quality of other relationships in the social network. Note, however, that the differential effects of emotional closeness of family versus other relationships on feelings of social embeddedness could not be tested, because nonfamily relationships were too rarely reported as being very close (i.e., in the innermost circle) when nuclear family members were available. We do not suggest that the availability of nuclear family is uniformly positive. On the contrary, conflict with relatives can have negative effects on well-being (Rook, 1984). Rather, the positive or negative quality of relationships to one's child or spouse may be more central than satisfaction with all other social relationships.

In contrast, when nuclear family members are unavailable, the average level of emotional closeness to others is strongly associated with feelings of social embeddedness irrespective of whether older people have been childless and never-married throughout their lives or whether they had prematurely lost their spouse or children. This finding suggests that the absence of nuclear family members may result in different social needs or demands in later life. Such differences may reflect compensatory investments in relationships that provide meaningful emotional contact (e.g., Lang, 1996; Chatters, Taylor, & Jackson, 1986). Furthermore, when nuclear family members are available, more than 90% of other very close emotional partners are kin, compared to only 35% among old people who do not have living nuclear family members available to them. It appears that when nuclear family members are unavailable, older people incorporate nonkin into their innermost circle of emotional confidants. Of course, because the study is cross-sectional cohort effects cannot be ruled out and any interpretation of underlying long-term selection processes needs to be considered cautiously.

In any event, it seems that there is not one path to social adaptivity in late life, and that the traditional nuclear family is not the only gateway to emotionally satisfying social networks in late life. Our findings suggest that although the absence of nuclear family does place one at risk for feeling depleted of gratifying emotional relationships in late life, many older people feel strongly embedded in social networks even when nuclear family members are absent. In fact, the absence of nuclear family members seems to even enhance the adaptiveness of emotional condensed social networks. One reason for this may be that very old people who do not have nuclear family members were more likely to report emotionally close relationships with friends than those who have nuclear family members. Although a greater number of close friendship relationships may be protective when nuclear family members are not available,

they may also be more unstable than relationships with a spouse or an adult child (e.g., Roberto, 1989). Thus, the finding that the average emotional closeness to others is differentially related to strong feelings of embeddedness depending on availability of nuclear family members may also indicate a protective mechanism of social adaptivity in late life (Staudinger et al., 1995).

In summary, our findings suggest that the average emotional closeness to social network members as an indicator of socioemotional selectivity serves an important adaptive function in late life that is not accounted for by individual differences in personality characteristics. When old people have a spouse or child available to them, emotional closeness with other people in the social network might not be as relevant to social adaptivity in late life. In contrast, when older people do not have nuclear family members, the emotional closeness of available network members appears to be essential for the satisfaction of socioemotional needs.

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REFERENCES

- Antonucci, T. C., & Akiyama, H. (1987). Social networks in adult life and a preliminary examination of the convoy model. *Journals of Gerontology*, *42*, 519–527.
- Antonucci, T. C., & Jackson, J. S. (1987). Social support, interpersonal efficacy, and health: A life course perspective. In L. L. Carstensen & B. A. Edelstein (Eds.), *Handbook of clinical gerontology* (pp. 291–311). New York: Pergamon Press.
- Baltes, P. B., & Baltes, M. M. (1990). Psychological perspectives on successful aging: The model of selective optimization with compensation. In P. B. Baltes & M. M. Baltes (Eds.), *Successful aging. Perspectives from the behavioral sciences* (pp. 1–34). New York: Cambridge University Press.
- Baltes, M. M., & Carstensen, L. L. (1996). The process of successful aging. *Ageing and Society*, *16*, 397–422.
- Baltes, P. B., Mayer, K. U., Helmchen, H., & Steinhagen-Thiessen, E. (1993). The Berlin Aging Study (BASE): Overview and design. *Ageing and Society*, *13*, 483–515.
- Borkenau, P., & Ostendorf, F. (1990). Comparing explanatory and confirmatory factor analysis: A study on the five-factor model of personality. *Personality and Individual Differences*, *11*, 515–524.
- Buss, D. M. (1991). Conflict in married couples: Personality predictors of anger and upset. *Journal of Personality*, *59*, 663–688.
- Cantor, N., & Fleeson, W. (1994). Social intelligence and intelligent goal pursuit: A cognitive slice of motivation. In W. D. Spaulding (Ed.), *Nebraska symposium on motivation* (Vol. 41, pp. 125–179). Lincoln: University of Nebraska Press.

- Carstensen, L. L. (1993). Motivation for social contact across the life span: A theory of socioemotional selectivity. In J. Jacobs (Ed.), *Nebraska symposium on motivation: Developmental perspectives on motivation* (Vol. 40, pp. 209–254). Lincoln: University of Nebraska Press.
- Carstensen, L. L. (1995). Evidence for a life-span theory of socioemotional selectivity. *Current Directions in Psychological Science*, 51–56.
- Carstensen, L. L., Gottman, J. M., & Levenson, R. W. (1995). Emotional behavior in long-term marriage. *Psychology and Aging*, 10, 140–149.
- Carstensen, L. L., & Lang, F. R. (1997). Social relationships in context and as context: Comments on social support and the maintenance of competence in old age. In S. Willis & K. W. Schaie (Eds.), *Societal mechanisms for maintaining competence in old age* (pp. 207–222). New York: Springer Publishing.
- Carstensen, L. L., & Turk-Charles, S. (1994). The salience of emotion across the adult life span. *Psychology and Aging*, 9, 259–264.
- Caspi, A. (1987). Personality in the life course. *Journal of Personality and Social Psychology*, 53, 1203–1213.
- Chatters, L. M., Taylor, R. J., & Jackson, J. S. (1986). Aged blacks' choices for an informal helper network. *Journal of Gerontology*, 41, 94–100.
- Connidis, I. A., & Davis, L. (1992). Confidants and companions: Choices in later life. *Journal of Gerontology: Social Sciences*, 47, S115–S122.
- Costa, P. T., & McCrae, R. R. (1985). *The NEO-Personality Inventory, Manual Form S and Form R*. Odessa, FL: Psychological Assessment Resources.
- Costa, P. T., & McCrae, R. R. (1994). Set like plaster? Evidence for the stability of adult personality. In T. F. Heatherton, & J. L. Weinberger (Eds.), *Can personality change?* (pp. 21–40). Washington, DC: American Psychological Association.
- Costa, P. T., Zonderman, A. B., & McCrae, R. R. (1985). Longitudinal course of social support among men in the Baltimore longitudinal study of aging. In I. G. Sarason, & B. R. Sarason (Eds.), *Social support: Theory, research, and applications* (pp. 137–154). Boston: Martinus Nijhoff Publishers.
- Cramer, D. (1993). Personality and marital dissolution. *Personality and Individual Differences*, 14, 605–607.
- Diener, E., Sandvik, E., Pavot, W., & Fujita, F. (1992). Extraversion and subjective well-being in a U. S. national probability sample. *Journal of Research in Personality*, 26, 205–215.
- Dykstra, P. A. (1993). The differential availability of relationships and the provision and effectiveness of support to older adults. *Journal of Social and Personal Relationships*, 10, 355–370.
- Feichtinger, L., Laireiter, A., Untner, A., & Baumann, U. (1992). Zum Zusammenhang zwischen Persönlichkeit und sozialem Netzwerk bzw. Netzwerkressourcen — Literaturüberblick und Pilotstudie [On the relationship between personality and social network resources — A review and pilot study]. *Zeitschrift für Differentielle und Diagnostische Psychologie*, 4, 233–247.
- Field, D., & Minkler, M. (1988). Continuity and change in social support between young-old and old-old or very-old age. *Journal of Gerontology: Psychological Sciences*, 43, P100–P106.
- Fredrickson, B., & Carstensen, L. L. (1990). Choosing social partners: How old age and anticipated endings make people more selective. *Psychology and Aging*, 5, 163–171.
- Harvey, A. S., & Singleton, J. F. (1989). Canadian activity patterns across the life span: A time budget perspective. *Canadian Journal on Aging*, 8, 268–285.
- Henderson, S., Byrne, D. G., & Duncan-Jones, P. (1981). *Neurosis and the social environment*. Canberra, ACT, Australia: Academic Press.
- Hogan, D. P. (1995). Sources of emergency help and routine assistance in old age. *Social Forces*, 73, 917–936.
- House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science*, 241, 540–545.
- Kahn, R. L., & Antonucci, T. C. (1980). Convoys over the life course: Attachment, roles and social support. In P. B. Baltes, & O. G. Brim (Eds.), *Life-span development and behavior* (pp. 254–283). San Diego, CA: Academic Press.
- Krause, N., Liang, J., & Keith, V. (1990). Personality, social support, and psychological distress in later life. *Psychology and Aging*, 5, 315–326.
- Kurdek, L. A. (1991). Marital stability and changes in marital quality in newly wed couples: A test of the contextual model. *Journal of Social and Personal Relationships*, 8, 27–48.
- Lang, F. R. (1996). Social support relationships of parents and non-parents in old and very old age. In H. Mollenkopf (Ed.), *Elderly people in industrialised societies* (pp. 41–51). Berlin, Germany: Edition sigma.
- Lang, F. R., & Carstensen, L. L. (1994). Close emotional relationships in late life: Further support for proactive aging in the social domain. *Psychology and Aging*, 9, 315–324.
- Lang, F. R., & Carstensen, L. L. (In press). Social relationships and adaptation in late life. In B. Edelstein (Ed.), *Comprehensive clinical psychology, Vol. 7: Geropsychology*. Oxford, England: Elsevier Science.
- Lawton, M. P. (1989). Behavior-relevant ecological factors. In K. W. Schaie & C. Schooler (Eds.), *Social structure and aging: Psychological processes* (pp. 57–78). Hillsdale, NJ: Erlbaum.
- Lee, D. J., & Markides, K. S. (1990). Activity and mortality among aged persons over an eight-year period. *The Journals of Gerontology: Social Sciences*, 45, S39–S42.
- Lindenberger, U., & Baltes, P. B. (1994). Sensory functioning and intelligence in old age: A strong connection? *Psychology and Aging*, 9, 339–355.
- Lindenberger, U., Gilberg, R., Poetter, U., Little, T., & Baltes, P. B. (1996). Stichprobenselektivität und Generalisierbarkeit der Ergebnisse in der Berliner Altersstudie [Sample selectivity and generalizability of findings of the Berlin Aging Study]. In K. U. Mayer & P. B. Baltes (Eds.), *Die Berliner Altersstudie* (pp. 85–108). Berlin, Germany: Akademie Verlag.
- Marsiske, M., Lang, F. R., Baltes, P. B., & Baltes, M. M. (1995). Selective optimization with compensation: Life-span perspectives on successful human development. In R. Dixon & L. Bäckman (Eds.), *Psychological compensation: Managing losses and promoting gains* (pp. 35–79). Hillsdale, NJ: Erlbaum.
- Morgan, D. L. (1990). Combining the strengths of social networks, social support, and personal relationships. In S. Duck, & R. C. Silver (Eds.), *Personal relationships and social support* (pp. 190–215). Newbury Park: Sage.
- Pillemer, K., & Suitor, J. J. (1991). “Will I ever escape my child's problems?” Effects of adult children's problems on elderly parents. *Journal of Marriage and the Family*, 53, 585–594.
- Roberto, K. A. (1989). Exchange and equity in friendships. In R. G. Adams, & R. Blieszner (Eds.), *Older adult friendship: Structure and process* (pp. 147–165). London: Sage.
- Rook, K. S. (1984). The negative side of social interaction: Impact on psychological well-being. *Journal of Personality and Social Psychology*, 46, 1097–1108.
- Rook, K. S. (1989). Strains in older adults' friendship. In R. G. Adams & R. Blieszner (Eds.), *Older adult friendship* (pp. 166–194). Newbury Park, CA: Sage.
- Russell, D., Cutrona, C. E., Rose, J., & Yurko, K. (1984). Social and emotional loneliness: An examination of Weiss's typology of loneliness. *Journal of Personality and Social Psychology*, 46, 1313–1321.
- Smith, J., & Baltes, P. B. (1996). Altern aus psychologischer Perspektive: Trends und Profile im hohen Alter [Aging from a psychological perspective: Trends and profiles in late life]. In K. U. Mayer, & P. B. Baltes (Eds.), *Die Berliner Altersstudie* (pp. 221–250). Berlin, Germany: Akademie Verlag.
- Staudinger, U. M., Marsiske, M., & Baltes, P. B. (1995). Resilience and reserve capacity in later adulthood: Potentials and limits of development across the life span. In D. Cicchetti & D. Cohen (Eds.), *Developmental psychopathology* (Vol. 2, pp. 801–847). New York: Wiley.
- Stokes, J. P. (1985). The relation of social network and individual difference variables to loneliness. *Journal of Personality and Social Psychology*, 48, 981–990.
- Tabachnik, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). New York: Harper Collins.
- Watson, D., Clark, L. A., McIntyre, C. W., & Hamaker, S. (1992). Affect, personality, and social activity. *Journal of Personality and Social Psychology*, 63, 1011–1025.
- Wills, T. A. (1985). Supportive functions of interpersonal relationships. In S. Cohen & S. L. Syme (Eds.), *Social support and health* (pp. 61–82). New York: Academic Press.
- Zautra, A. J., Finch, J. F., Reich, J. W., & Guarnaccia, C. A. (1991). Predicting the everyday life events of older adults. *Journal of Personality*, 59, 507–538.