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22 Changes in social networks and cognitive decline

- Cognitive performance declines as older adults remove social ties, particularly if relationships are excluded for an extended period
- Adding close ties to the social network is beneficial for cognition, similar to the effects of continuously including these ties
- Changes in the relationships with children and friends are particularly meaningful for cognition, but the inclusion of the spouse in the social network is not

22.1 Cognition and social networks in late life

Cognitive functioning is a meaningful part of well-being in older age. Evidence suggests that social relationships can play a protective role in maintaining cognition in later life and mitigating cognitive decline. Social ties can provide stimulating 'cognitive exercise', buffer the effects of stress, encourage health-promoting behaviours and build cognitive reserves (Kelly et al., 2017). Moreover, evidence generally indicates that larger social networks and more frequent contact with social ties are related to better cognition (Kelly et al., 2017).

Older adults commonly report having close social ties but also experience losses and gains in these relationships as they age. They may add new ties to their close circle or diminish their existing relationships with close ties as a result of life events or changes in their social preferences (Cornwell et al., 2014). However, many studies do not differentiate between persons who have maintained a stable level of social connections over the years and those whose social ties have transformed. For example, a small social network can indicate no contact with close friends over an extended period, reflecting a long-lasting lack of cognitive stimulation. Conversely, a small network may also indicate that regular contacts have only recently diminished and, thus, might have weaker effects on cognition. The distinction between stable and changed ties is important because persons who have few social ties over longer periods may be at a higher risk of cognitive decline.

The nature of the social tie may also have significant implications for the cognitive function. For example, friends might provide more leisure activities, whereas children tend to provide more emotionally meaningful support in the

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face of stress. However, the findings are mixed regarding the role of family and friends in cognitive function (Aartsen et al., 2004; La Fleur and Salthouse, 2016). Therefore, this chapter examines changes in four different types of social ties that are prevalent among older adults – spouse, children, other relatives and friends – in relation to older adults' cognitive function. This chapter also examines the role of stability versus change over time in the availability of these four types of social ties.

22.2 Data and methods

The analyses presented in this chapter are based on the fourth and sixth waves of SHARE, collected in 2011 and 2015, respectively. These analyses focus on adults aged 65 and older. Cognitive performance is represented by a summary score combining three tests: immediate recall, delayed recall and fluency. The first test consists of reading ten words and asking respondents to repeat them. The second measure asks respondents to repeat the same word list after a ten-minute interval. The third probe reflects the number of animals that participants can name in one minute. The scores from these three tests were standardized and their mean score was used as a general measure of cognitive performance.

Social networks were measured by asking respondents to name up to seven people with whom they discuss important matters and to request additional information about them (Schwartz, Litwin and Kotte, 2017). The networks were assessed in two separate waves, enabling us to distinguish between stable availability or unavailability of different types of social ties (spouse, children, relatives and friends) and temporary availability or unavailability of these same types of ties, such as citing versus not citing friends in both waves or removing friends who were only cited in Wave 4 versus adding friends in Wave 6. The spousal and child relationships included a fifth category of not having a spouse or children at all. For spouses, this category also included participants whose spouse died between the study waves. This scenario indicated that persons who 'removed' their spouse from the network still had a spouse but no longer mentioned him or her as a close social network member. The study sample numbered 13,411 adults who had full information on all study variables.

The analyses began with a description of the change patterns experienced by the older adults. We then regressed the changes in cognitive performance on changes in social networks and controlled for key covariates: age, gender, education, financial adequacy, self-rated health, mobility limitations, hearing ability and country of residence. The analyses were weighted to account for the

sample design and for respondents' differential probabilities of participating by using the Wave 4 weights. These baseline weights were then adjusted for attrition (Cornwell et al., 2014).

22.3 Stability and change of confidant availability

Figure 22.1 presents the patterns of change among the ties nominated as close social network members. The figure indicates that most respondents either mentioned a spouse in their social network in both measurements (42%) or lacked a spouse (40%). Between 5 and 7 per cent did not mention once or twice their spouse as a close social tie. Half of the respondents cited their children as social network members at both measurements. They were also slightly more likely to add children to their networks over time (16%) than to remove them (10%) or not to ever cite them (13%). Approximately half of the respondents (52%) did not mention any relatives at either measurement, whereas almost

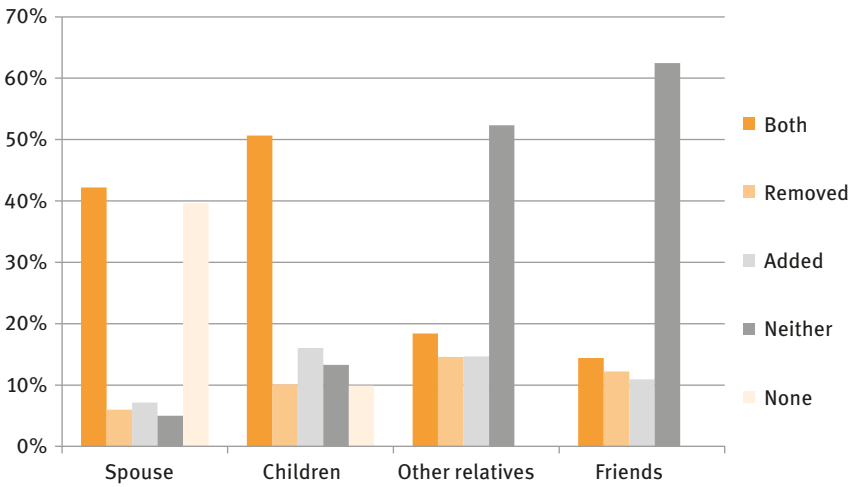

Figure 22.1: Change patterns in confidant relationships between Wave 4 and Wave 6 (weighted).
Note: Both – in SN in both waves; Removed – removed from SN in Wave 6; Added – added to SN in Wave 6; Neither – not mentioned in SN in both waves; None – respondent does not have a spouse\child.
Source: SHARE Wave 4 and 6 release 6.1.0.

one-fifth mentioned relatives at both measurements (18%). Close to one-sixth (15%) had a change in the naming of relatives. Finally, almost two-thirds of respondents (62%) did not mention friends at either time point, whereas the rest mentioned friends at both time points (14%), removed friends (12%) or added friends (11%) over time.

We next analyse the network data in relation to changes in the cognition score over time. For this purpose, we ran an OLS regression model (Figure 22.2). The reference category for the social network variables was respondents who continuously cited the social network member in each relationship category at both measurements. The results revealed that a decline in the cognition score

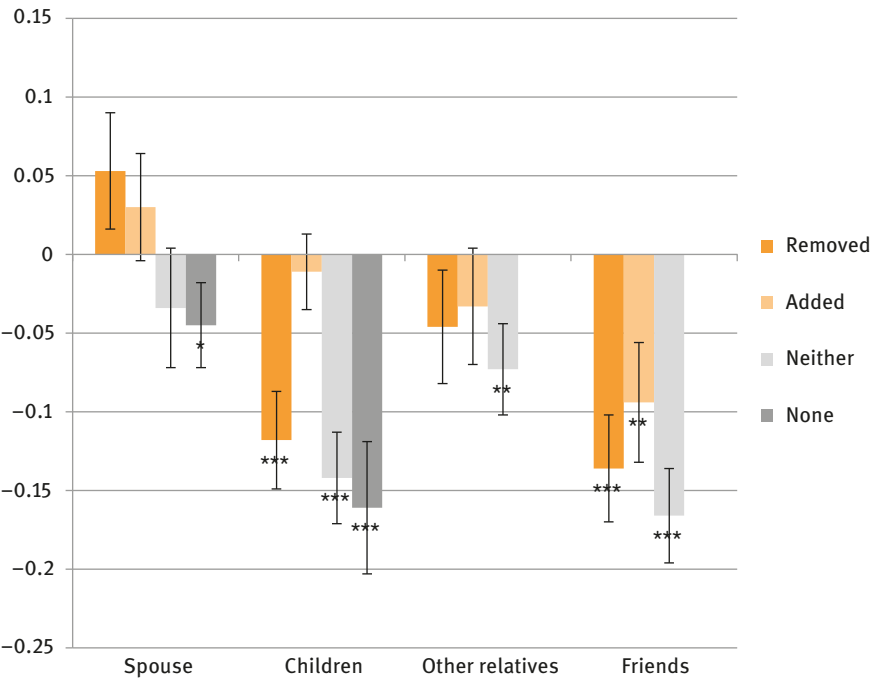

Figure 22.2: OLS regressions of cognition on social network changes between Waves 4 and 6 (weighted).
Significance: *** = 1%; ** = 5%; * = 10%.
Note: The effects presented are compared with citing the person in the social network in both waves. Controlled for baseline cognition, age, gender, education, financial adequacy, self-rated health, mobility limitations, hearing and country.
Removed – removed from SN in Wave 6; Added – added to SN in Wave 6; Neither – not mentioned in SN in either wave; None – respondent does not have a spouse\child.
Source: SHARE Wave 4 and 6 release 6.1.0.

was associated with not having a spouse at all relative to continuously citing the spouse as a network member. We note that this category included persons whose spouse passed away between the two measurements; therefore, cognitive decline may also be associated with being widowed. Changes in the naming of the spouse as a social network member did not differ in their effects on cognition from that of the reference category. Changes in the naming of children among one's close social ties had a negative association with cognition, such that removing children from the close network and not citing them continuously was associated with lower cognition. Adding children to the network did not differ from continuously citing children in the associations with cognition.

Turning to relatives in the social network, changes in their inclusion in the network had similar associations with cognition as did continuously citing them as close ties. Only continuously not citing relatives as confidants was related to worse cognitive consequences. In comparison, changes in the inclusion of friends in the network had the most consistent associations with cognition scores. Both the addition and the removal of friends from the close network was related to worse cognition relative to continuously citing them. Not having friends as confidants at either time point was also related to poorer cognition.

22.4 Discussion

This study explored how changes within older adults' social networks are related to cognitive functioning in old age. The results indicate that cognitive performance declines as older adults remove social ties and that cognition is particularly sensitive to continuously excluding persons from one's social network. The identity of the excluded confidants also emerged as important, such that changes in the relationships with children and friends were particularly meaningful to cognitive decline.

Older adults seem to be particularly vulnerable to cognitive decline when they suffer from a continual lack of social ties – when excluding children, relatives and friends from their close ties for long periods. Such a distancing of social ties may imply less social interactions and less cognitive stimulation over time, possibly contributing to the more detrimental effect. However, even changes that occurred in a shorter timeframe – mentioning children and friends at Wave 4 and excluding them four years later – had negative implications. Thus, even a few years without these close ties seem to entail negative effects. These findings suggest that practitioners should pay attention to adults who

are chronically lacking close family and friendship ties and to those who seem to lose touch with their children and friends.

On a more positive note, the findings generally indicate that adding close ties had as strong an impact as continuously citing them in the network. Therefore, even relatively new additions to one's close social network are positively related to cognition. These findings imply that, even in old age, the addition of ties can favourably affect cognitive functioning, perhaps resulting from having more frequent, meaningful and cognitively stimulating interactions. Thus, practitioners should encourage their older patients to improve and strengthen their close ties.

The current study also draws attention to the nature of older adults' social ties given that different types of close ties were found to differ in their association with cognition. Friends and children were shown to be especially meaningful for cognitive functioning, whereas spousal ties had almost no association with cognition outcome. That friends and children provide more frequent and/or more cognitively stimulating interactions is possible. Friendship ties, for example, might involve more leisure activities and more novel topics of conversation. Close children might encourage health-promoting behaviours and assist in coping with stress (Kelly et al., 2017). Thus, looking at the general patterns of social losses and gains is not enough; knowing who is being lost or gained is also necessary.

The lack of a spousal tie seemed related to cognition only if no spouse existed or if the spouse passed away. However, excluding one's spouse from the network while still having a spouse was not related to cognition. In such cases, the spouse may still be available as a source of mental stimulation even if he or she was not viewed as a source of emotional support.

We should note that the findings from this study might also indicate that older adults who suffer from cognitive decline are more likely to remove close ties instead of removing ties leading to cognitive decline. Previous findings have shown that both processes may be at play (Kelly et al., 2017). Whatever the case, the findings nevertheless suggest that attention should be paid to adults who remove close ties, particularly friends and children, because they might face an increased risk of cognitive decline.

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