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Social support in later life: Examining the roles of childhood and adulthood cognition

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Abstract

Social support is associated with health in old age. However, it is unclear whether this association is because social support helps maintain health or because people who are healthier are also advantaged in other ways (cognitive ability, education, wealth etc.) and thus have better access to social support. To investigate possible causal direction, we examined social support in later life in relation to cognitive ability in childhood (11 years) and later life (64 years). Our participants were 266 adults aged about 64 years (132 men, 134 women) recruited to the Aberdeen Birth Cohort 1936 study. Higher childhood cognitive ability, but not cognitive ability in later life, was associated with receiving less practical and emotional support, and being less satisfied with the support received. This pattern of results suggests that the relationship between cognition and social support is determined early in life and continues into later life.

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1. Introduction

As life expectancy increases, growing numbers of people survive into old age. While some older people age successfully, remaining cognitively able and living and functioning independently, others show marked cognitive decline and require support in everyday functioning. It is, therefore, important to understand the factors that may underlie “successful ageing”. Social support is one of many factors that may contribute to variations in the ageing process. Individuals who have effective social networks have a reduced risk of mortality (Seeman, 1996), better physical health (Vaillant, Meyer, Mukamal, & Soldz, 1998), reduced risk of dementia (Fratiglioni, Wang, Ericsson, Maytan, & Winblad, 2000, 2004) and protection against loss of functional capacity in old age (Hagberg & Nordbeck, 2002).

Studies have examined possible changes in social support across the life course. In a study of support in people aged 16–70+ years old, there was no difference between amounts of social support received by younger and older adults (Furukawa, Harai, Hirai, Kitamura, & Takahashi, 1999). Similarly, studies using longitudinal designs report no loss of social support with ageing (Field, 1999; Gurung, Taylor, & Seeman, 2003; Lang, 2000). However, older adults may have less frequent contact with the people in their network and reduce the size of their social networks in order to concentrate their resources on a smaller, closer social network, whilst still being satisfied with the size of their social support network (Lansford, Sherman, & Antonucci, 1998). This suggests that older adults maintain good social support networks into old age.

Studies examining the relationship between social support and cognitive ability have provided conflicting findings. Okabayashi, Liang, Krause, Akiyama, and Sugisawa (2004) investigated the relationship between cognitive function and social support in 2200 adults in Japan over the age of 60 years. They found no relationship between social support and cognitive function in samples comprising only individuals with a spouse and children. However, people without a spouse were found to show less cognitive impairment if they received support from their children. Although this study suggests that there may be a relationship between social support and cognitive function in later life, the relationship was investigated at one time point. Other studies have considered the relationship using longitudinal designs. Gurung et al. (2003) conducted a longitudinal study of couples aged 70–79 years old, over an average period of twenty-three months. They reported that social support increased over this period. Cognitive ability at the two testing sessions was not predictive of either the emotional or instrumental (practical) support received. In contrast, another study, conducted over a 7.5-year period detected a positive relationship between cognitive function and emotional support, but not practical support (Seeman, Lusignolo, Albert, & Berkman, 2001). It seems that the possible relationship between social support and cognitive ability is unclear. Given the importance of social support for maintaining quality of life in old age, it is important to further examine the relationship between social support and cognitive ability.

It is interesting to consider why a relationship might exist between social support and cognition and how these might be distinguished between with our data. There are two possible ways of considering the relationship between cognition and social support. First, there may be a direct relationship between cognitive ability and social support. If this were the case either a positive or a negative relationship between the two variables might be predicted. Individuals of higher cognitive ability may possess more efficient ‘life skills’ which would in turn lead to greater and more

satisfactory social support (i.e., a positive relationship). This relationship would be consistent with that found by Okabayashi et al. (2004) and Seeman et al. (2001). Alternatively, individuals of higher cognitive ability may seek a more independent lifestyle and hence may receive, and indeed desire, less social support (i.e., a negative relationship). Second, the relationship between cognitive ability and social support may be indirect. In this case no relationship might be predicted, consistent with the findings of Gurung et al. (2003). For example, cognitive ability may be highly correlated with a third variable. If this were the case, it may be this third variable that mediates levels of social support. It is therefore important to consider, and measure, possible variables that may result in an indirect relationship between cognitive ability and social support.

Possible variables to consider are those that have been shown to correlate with social support, such as living group, sex and personality. Living group (i.e. living with someone or living alone) has been associated with an increased risk of dementia (Fratiglioni et al., 2000, Fratiglioni, Pailard-Borg, & Winblad, 2004) and a study of people over the age of 65 years found that those who live alone report less social support than those who live with another (Yeh & Lo, 2004). Sex differences in social support have also been identified for social support outside of the family in older adults, with an increase in support for women and a decrease in support for men (Field, 1999). Men have been reported to receive more support from their spouse than women (Coventry, Gillespie, Heath, & Martin, 2004; Gurung et al., 2003). Personality traits have also been identified that are related to social support. Extraversion and size of social support network are positively related, whereas neuroticism is negatively related to the perceived quality of social support (e.g. Laakey & Dickinson, 1994). Longitudinal studies also examine the relationship between personality and social support over time. VonDras and Siegler (1997) took personality measures at college entry and observed that extraversion was predictive of social support at midlife. It is, however, possible that observed relationships between personality and social support arise from perceptions and/or reporting of social support being biased in individuals with particular personality traits (for more detail refer to the discussion of this paper).

As explained above, three possible relationships between social support and cognitive ability can be predicted: a direct positive relationship, a direct negative relationship or an indirect relationship. It is possible to distinguish between these three possible outcomes using multiple regression models to predict social support in later life. Predictors will be entered into the model in two blocks: the first block will comprise personality, sex and living group; and the second block will comprise cognitive ability. If there is an indirect relationship between cognitive ability and social support, then variables entered into the first block will account for the greatest proportion of variance and cognitive ability would not explain any of the residual variance. If there is a direct relationship between cognitive ability and social support, cognitive ability will be a significant predictor of social support, even after taking into account the variance in social support explained by personality, sex and living group.

One possible issue that may arise in examining the relationship between cognitive ability and social support in older participants, even with longitudinal designs within old age, is the measurement of cognition: does performance reflect premorbid, stable cognitive ability traits, or a cognitive ability state following some cognitive decline? This question can be investigated if the level of cognitive ability is known before old age, for example, within childhood. The present study includes a measure of cognitive ability at 11 and 64 years. Including these two measures of cognitive ability also enables the temporal precedence of the relationship between cognition and

social support to be examined. If the association is strongest between social support and current cognitive ability, this will imply that social support is, at least to some extent, determined by a person's current level of cognitive ability. An individual's social support network is assumed to vary with cognitive ability. As such, if an individual shows cognitive decline, it would be predicted that they would also show reduced social support. Therefore it is predicted that if the association is strongest between social support and childhood cognitive ability, this may suggest that a person's social support network is more stable and less affected by changes in cognitive ability.

This study examines the relationship between cognition and social support in later life, after taking into account the possible relationships with sex, living status and personality. Previous research has identified two distinct aspects of social support: emotional and practical/instrumental support; each of which can be measured in terms of its quantity or perceived quality (e.g. Doeglas et al., 1996). Therefore, this study will consider both the type of social support being received and the distinction between quantity and perceived quality (satisfaction). Importantly the strength of the associations between measures of cognition taken at two time points (childhood and late adulthood) and social support will be compared.

2. Methods

2.1. Participants

Participants had all taken part in the Scottish Mental Survey in 1947 at age 11 years (Deary, Whiteman, Starr, Whalley, & Fox, 2004). In 1999, we matched archived mental test results with current health registers by name, sex and date of birth. 506 people agreed to participate at aged about 64 years. 266 of these (132 men, 134 women) provided data on all of the measures examined in this study and are included in the analyses presented in this paper (see Table 1). The number of participants included in this analysis is less than that initially recruited primarily due to partici-

Table 1
Demographic details of 266 community dwelling adults (aged about 64 years old and all born in 1936) who participated in this study

		Men <i>N</i> = 132	Women <i>N</i> = 134	Total <i>N</i> = 266
Marital status ^a	Single	7	12	19
	Married	114	90	204
	Widowed	4	21	25
	Divorced	7	11	18
Living group ^b	With someone	98	87	185
	Alone	34	47	81
Years of education (\bar{X} , SD)		11.3 (2.0)	11.2 (2.1)	11.3 (1.9)

^a Marital status by sex: $\chi^2(3) = 16.6, p = .001$.

^b Living group by sex: $\chi^2(1) = 2.7, p = .099$.

pants failing to complete the social support questionnaire. Those included in this analysis are of higher childhood cognitive ability than those who were not ($t(503) = -3.0, p = .003$).

2.2. Measures

Social support was assessed using the Significant Others Scale (SOS; Power, Champion, & Aris, 1988). Participants were asked to nominate up to seven people who are important to them. They rated the amount of emotional and practical support they receive from each person, and the amount they would like to receive from each person, on a seven-point Likert scale. From this two measures were taken: *quantity* of support received across all people nominated (actual ratings) and perceived *quality* of support received (difference between actual and ideal ratings). The quantity and perceived quality measures were calculated separately for emotional and practical support giving four measures in total. For the quantity measure, higher scores indicate more support received. For the perceived quality measure, a positive score indicates satisfaction with the support received and a negative score indicates dissatisfaction with the support received.

In 1947, most of the children attending Scottish schools that were born in 1936 completed the Moray House Test (see Deary et al., 2004). The Moray House Test is a test of general cognitive ability where high scores indicate higher cognitive ability. Participants in the present study completed Raven's standard progressive matrices (Raven, Court, & Raven, 1977), which is a 60-item test of fluid, non-verbal reasoning, at age about 64 years. The test was given with a 20-min time limit. Although different cognitive ability tests were used at each time point, previous research has shown a highly significant correlation between them when taken at the same time point, suggesting that both measure the same latent ability (Deary, Whalley, Lemmon, Crawford, & Starr, 2000). The personality traits of neuroticism, extraversion, openness, agreeableness, and conscientiousness were assessed using the 60-item NEO Five-Factor Inventory (Costa & McCrae, 1992). Higher scores indicate stronger personality traits.

2.2.1. Statistical analyses

Analyses examined possible factors associated with social support using hierarchical (blocked), stepwise multiple linear regression. Sex, living group and personality were entered into the first block. Childhood cognitive ability and cognitive ability age 64 years were then entered into the second block, using stepwise entry, to enable them to compete and determine the extent to which each is associated with social support in later life. Four multiple regression analyses were run for each social support measure: amount of emotional support received, satisfaction with emotional support received, amount of practical support received and satisfaction with practical support received. Adjusted R^2 is presented as the percentage of variance explained for each variable entered into the model.

3. Results

Means and standard deviations for the social support measures are given in Table 2, and for the mental ability and personality traits scores in Table 3. The correlations among these variables are shown in Table 4. Regression analyses are presented in Table 5.

Table 2

Mean (standard deviation) scores derived from the Significant Others Scale from 266 community dwelling adults aged about 64 years old

		Men <i>N</i> = 132	Women <i>N</i> = 134	Live with someone <i>N</i> = 185	Live alone <i>N</i> = 81	Total <i>N</i> = 266
Emotional	Quantity of support received	12.0 (1.6)	12.0 (1.6)	12.0 (1.6)	12.0 (1.6)	12.0 (1.6)
	Quantity of support desired	12.3 (1.7)	12.2 (2.3)	12.5 (1.3)	11.7 (3.0)**	12.3 (2.0)
	Quality of perceived support	-.4 (1.6)	-.2 (2.4)	-.6 (1.2)	.3 (3.2)**	-.3 (2.1)
Practical	Quantity of support received	11.4 (2.0)	10.8 (2.2)*	11.2 (2.1)	10.8 (2.1)**	11.0 (2.1)
	Quantity of support desired	11.7 (2.0)	11.2 (2.4)	11.8 (1.7)	10.8 (3.0)**	11.5 (2.2)
	Quality of perceived support	-.4 (1.5)	-.5 (2.4)	-.6 (1.2)	.01 (3.2)*	-.4 (2.0)

* $p < .050$.

** $p < .010$.

Table 3

Mean (standard deviation) scores of the cognitive and personality tests from 266 community dwelling adults aged about 64 years old

	Men <i>N</i> = 132	Women <i>N</i> = 134	Total <i>N</i> = 266
Mental ability at age 11 years	42.0 (12.6)	45.0 (12.2)	43.5 (12.4)
Raven's progressive matrices	36.2 (8.6)	36.7 (8.2)	36.4 (8.4)
NEO-O	24.3 (5.6)	25.6 (5.7)	24.9 (5.7)
NEO-C	34.8 (5.4)	36.1 (6.2)	35.5 (5.9)
NEO-E	26.7 (5.5)	28.2 (6.0)*	27.5 (5.8)
NEO-A	31.6 (5.2)	34.9 (4.6)**	33.3 (5.2)
NEO-N	17.0 (7.7)	17.7 (7.8)	17.4 (7.8)

* $p < .050$.

** $p < .001$.

3.1. Analysis of quantity of emotional support received

Higher extraversion scores were associated with higher levels of emotional support ($F(1, 264) = 9.3, p = .003$) accounting for 3.4% of the variance. None of the other variables in this block were significant. Childhood cognitive ability was associated with the amount of emotional support received at age about 64 years ($F(1, 263) = 5.2, p = .023$), accounting for an additional 1.9% of the variance. Participants of higher childhood cognitive ability reported less emotional support. Cognitive ability age 64 years was not significantly associated with the amount of emotional support received ($p = .671$).

3.2. Analysis of satisfaction with emotional support received

Living group significantly associated with satisfaction with emotional support received ($F(1, 264) = 10.0, p = .002$) accounting for 3.7% of the variance. People that lived with someone reported greater dissatisfaction with the emotional support they receive than those who lived

Table 4
Correlations between social support measures and possible associated factors

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Emotional: quantity received	–	.37***	.41***	.77***	.37***	.37***	–.12*	–.06	.01	.15*	.18**	.10	–.14*
2. Emotional: quantity desired		–	–.69***	.30***	.87***	–.64***	.09	.09	.10	.08	.10	.08	–.02
3. Emotional: satisfaction			–	.31***	–.56***	.92***	–.19**	–.14*	–.10	.04	.05	.01	–.09
4. Practical: quantity received				–	.55***	.42***	–.16*	–.07	–.02	.09	.14*	.04	–.15*
5. Practical: quantity desired					–	–.53***	.04	.06	.06	.08	.09	.04	–.02
6. Practical: satisfaction						–	–.21***	–.13*	–.08	.01	.04	–.01	–.13*
7. Mental ability at age 11 years							–	.57***	.31***	.05	.08	.22***	–.22***
8. Raven's progressive matrices								–	.29***	.12	.13*	.22***	–.26***
9. NEO–O									–	.04	.09	.12	–.09
10. NEO–C										–	.39***	.23***	–.39***
11. NEO–E											–	.18**	–.46***
12. NEO–A												–	–.27***
13. NEO–N													–

* $p < .05$.

** $p < .01$.

*** $p < .001$.

alone. High scores on the openness personality variable were associated with less satisfaction with social support received ($F(1, 263) = 3.9, p = .049$) accounting for an additional 1.4% of the variance. None of the other variables in this block were significant. Childhood cognitive ability was also significantly associated with satisfaction with emotional support received ($F(1, 262) = 7.3, p = .007$) accounting for an additional 2.6% of the variance. Participants of higher childhood cognitive ability reported being less satisfied with the emotional support they receive. Cognitive ability age 64 years was not significantly associated with satisfaction with emotional support received ($p = .662$).

3.3. *Analysis of quantity of practical support received*

Neuroticism was associated with the quantity of practical support received ($F(1, 264) = 5.8, p = .017$) accounting for 2.1% of the variance. Participants that scored higher on the neuroticism scale reported receiving less practical support. Men reported receiving more practical support than women ($F(1, 263) = 5.4, p = .021$) accounting for an additional 2.0% of the variance. None of the other variables in this block were significant. Participants of higher childhood cognitive ability reported lower levels of practical support ($F(1, 262) = 8.7, p = .004$) accounting for an additional 3.1% of the variance. Cognitive ability age 64 years was not significantly associated with the amount of practical support received ($p = .657$).

3.4. *Analysis of satisfaction with practical support received*

People that lived with someone reported greater dissatisfaction with the practical support they receive ($F(1, 264) = 5.5, p = .020$) accounting for an additional 2.0% of the variance. High neuroticism was significantly associated with dissatisfaction with practical support received ($F(1, 263) = 4.8, p = .030$) accounting for 1.8% of the variance. None of the other variables in this block were significant. Participants of higher childhood cognitive ability reported less satisfaction with practical support received ($F(1, 262) = 17.1, p < .001$) accounting for an additional 5.9% of the variance. Cognitive ability age 64 years was not significantly associated with satisfaction with practical support received ($p = .309$).

4. Discussion

The aim of this paper was to examine a possible association between social support and cognitive ability (measured at age 11 years and age 64 years). We found no evidence for a relationship between social support and cognitive ability when both were measured at age 64. This finding is consistent with some previous research (Gurung et al., 2003), though others have identified a positive relationship between cognition and social support (Okabayashi et al., 2004; Seeman et al., 2001). Unlike other research in the area, we were uniquely placed to examine the relationship between childhood cognitive ability and social support in later life. Individuals of higher childhood cognitive ability reported receiving less social support and being less satisfied with the support they received. Although there is no directly comparable published data, the negative relationship reported here is in the opposite direction to the positive relationship shown when examining

Table 5
Multiple regression analyses analysing social support variables in 266 community dwelling adults aged about 64 years old

		Variable significance	Standardised β coefficient	Adjusted R^2	Standard error	Model significance
Emotional support: quantity	Extraversion	$t = 3.0, p = .003$.18	.046	1.6	$F(2, 263) = 7.3, p < .001$
	Childhood cognitive ability	$t = -2.3, p = .023$	-.14			
Emotional support: satisfaction	Living group	$t = 3.2, p = .002$.19	.066	2.0	$F(3, 262) = 7.2, p < .001$
	Openness	$t = -2.0, p = .049$	-.12			
	Childhood cognitive ability	$t = -2.7, p = .007$	-.17			
Practical support: quantity	Neuroticism	$t = -2.4, p = .017$	-.15	.061	2.0	$F(3, 262) = 6.8, p < .001$
	Sex	$t = -2.3, p = .021$	-.14			
	Childhood cognitive ability	$t = -2.9, p = .004$	-.18			
Practical support: satisfaction	Living group	$t = 2.6, p = .010$.15	.087	2.0	$F(3, 262) = 9.4, p < .001$
	Neuroticism	$t = -3.1, p = .002$	-.19			
	Childhood cognitive ability	$t = -4.1, p < .001$	-.25			

cognitive ability and social support at the same time point in old age (Okabayashi et al., 2004) or over a 7.5-year time period (Seeman et al., 2001). This suggests that the association between social support and childhood cognitive ability may represent a relationship that is distinct from that found between social support and cognitive ability in old age. Our finding implies that a person's ability to develop and maintain social support networks is associated with cognitive ability from early life. Further, the lack of relationship with current cognitive ability suggests that change in cognitive ability may not affect social support. This finding has important implications for the development of socialisation in childhood as it suggests that failure to develop satisfactory social relationships at a young age may persist into later life.

The way in which we analysed our data allows us to consider whether there is a direct or indirect relationship between cognitive ability and social support (see Introduction). In all four analyses cognitive ability was a significant predictor of social support, even after taking into account personality, sex and living group. This suggests a direct relationship between the two variables. Further, the negative relationship identified suggests that individuals of higher childhood cognitive ability receive less support and are less satisfied with the support they receive. It is possible that individuals of higher cognitive ability seek a more independent lifestyle both in early and late adult life. Consequently, such individuals may expect and receive less social support. This limited level of support may be maintained into later life, both in terms of the amount of support that is offered to an individual and the amount that the individual is willing to accept. However, if an individual's cognitive ability declines, they may become less satisfied with the amount of support they receive. This explanation is also consistent with our finding that social support in later life is more strongly associated with childhood cognitive ability than cognitive ability in later life.

A number of other associations were also identified. Individuals who lived alone reported no difference in the amount of social support they received, but were more satisfied, whereas previous work has identified differences in the amount of social support received (Yeh & Lo, 2004). The only sex difference identified in our study was that men receive more practical support; this is consistent with other research (Coventry et al., 2004; Gurung et al., 2003). Extraversion, openness and neuroticism were each associated with different aspects of social support. The association we identified between personality and social support was as expected (Lakey & Dickinson, 1994; VonDras & Siegler, 1997).

While we have reported several novel findings, it is important to set out the limitations of this study, primarily our selection of factors to consider. The study identified some factors associated with social support in later life but other factors may also be relevant. For example, we did not consider different sources of social support. Given that different patterns of social support have been reported according to the source providing the support (e.g. Gurung et al., 2003), more subtle relationships may exist that we were unable to examine. Inclusion of these unmeasured variables might have a large impact, particularly if measured and unmeasured variables were correlated. The findings of this study may also be influenced by the use of self-report measures. Of particular importance is the possible effect of cognitive ability or certain personality traits on the completion of the social support questionnaire. Individuals who are experiencing cognitive decline may experience difficulty in completing the social support questionnaire, which threaten the validity of the measure in some individuals. This is particularly relevant given that participants with complete data who were included in these analyses were of higher childhood cognitive ability than those with incomplete data. Individuals with certain personality traits may also exhibit a bias

when completing questionnaires such as the significant others questionnaire that may cause some findings to be either overestimated or underestimated.

The most important finding to emerge from this paper is that childhood cognitive ability is associated with social support in late mid-life, whereas current cognitive ability is not. This lends strong support to our rationale that cognitive ability prior to any cognitive decline that may have occurred in later life may be a more important predictor of social support than cognitive ability within later life. The following question may be posed: what is the relationship between cognitive decline and social support in later life? Given that lower levels of social support are a risk factor for dementia, it becomes plausible to propose that people with less social support are more vulnerable to cognitive decline. The participants of this study are currently returning for further cognitive examination and some already meet diagnostic criteria for dementia. With these new data such possibilities may be examined.

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