The New Zealand Longitudinal Study of Ageing

Summary Report

- Social Integration, Health and Quality of Life -

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Introduction

A considerable body of international evidence to date has demonstrated the health benefits of social integration. The benefits of social integration include better quality of life (Pinquart, & Sörensen, 2000) and lower levels of loneliness and discrimination (Choi & Mayer, 2000; Jasinskaja-Lahti, Liebkind, Jaakkola, & Reuter, 2006). An important aspect of social integration is social support from friends, workmates, and family. Support may be gained from integration into supportive social networks. Together, positive social support from networks of family and friends have been shown to exert significant effects on the health and general functioning of older persons (Smith & Christakis, 2008). People who report more social ties have lower mortality risks, and increased social integration and social support have been related to better physical and mental health (Seeman et al., 2001; Uchino, 2006). Conversely, poor social connections, fewer social activities and social disengagement in people over the age of 65 have been shown to predict greater risk of cognitive decline across different cultural contexts (Barnes, De Leon, Wilson, Bienias, & Evans, 2004; Zunzunegui et al., 2004). In general, it has become clear across decades of research that both perceived social support and engagement with social networks is related to better physical and mental health.

To systematically compare international findings with data from the New Zealand Longitudinal Study of Ageing (NZLSA), this large body of research was considered across several important dimensions. First, across differences in the ways in which social relationships have been conceptualised: in terms of the objective measurement of social networks as numbers or types of social connections; in terms of subjective or perceived social support; or as social connectedness. Second, across the different aspects of functioning that have been considered as indicators of health and well-being or the outcomes of support. These include physical and mental health and quality of life. This report also examines how physical health and mental health have changed from 2010 to 2012 and how change may be attributed to different levels of social integration.

This body of research has also taken account of a number of different factors that may interact with the relationship between social integration, health and quality of life. The most significant of these include differences in the relationships between social integration and positive outcomes for men or women, differences with age or ethnicity, and differences for levels of socio-economic status (SES) as indicated by income, education and economic living standards (see Jenson, Spittal, & Krishnan, 2005).

Accordingly, in this report we will consider the NZLSA findings for the importance of social networks, social support, and social connectedness—together referred to as social integration—in relation to physical health, mental health and quality of life. Interactions with gender, age, retirement status, marital status, ethnicity, and SES will also be considered.[1] This report primarily draws on the responses of 3,311 men and women aged 48 to 90 who took part in the NZLSA study

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[1] All results are based on weighted frequencies and means.

in 2010. Responses from the 2012 survey are also used to assess change in health status over time.

Social Networks

Networks are the groups of people with whom we regularly and intimately interact and who provide support. Accordingly, Berkman et al. (2000) described social networks as the precursors of social support. The social networks of older people tend to vary in size and composition, and research has shown that network type (rather than simply network size) may be used to indicate both access to support and levels of social participation, and is related to both physical and mental health outcomes. For example, Litwin & Shiovitz-Ezra (2006) explored the association between network type and mortality. They described the social networks of a sample of community dwelling older Israelis as either diverse, friend-focused, neighbour-focused, family-focused, community-clan, or restricted. Among the older members of their sample (aged over 70) network type was associated with mortality risk. People who had diverse, friend-focused and community-clan type networks showed lower risk of all cause mortality seven years after assessment.
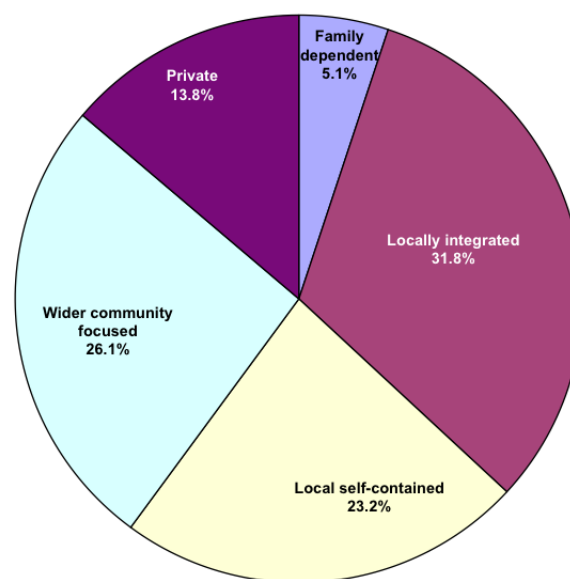
Figure 1. Distribution of Wenger network categories

Wenger (1997) used qualitative research to identify five different network types among older adults that are associated with different strengths and risks for particular health and health care problems. Wenger and Tucker (2002) described the development of an assessment instrument to categorise these five types of older adults' social networks as follows. The *Local Family Dependent* Support Network is focussed on close family ties with fewer neighbourhood and friend links. The *Locally Integrated* Support Network includes close relationships with local family, friends and neighbours. The *Local Self-contained* Support Network has primary reliance on neighbours. The *Wider Community Focused* Network is typified by a high salience of friends. The *Private Restricted* Support Network has no relatives, few nearby friends and low levels of community involvement. Questions from this scale were used to

categorise respondents' network types in the NZLSA study. Figure 1 illustrates the distribution of the NZLSA sample according to Wenger's network classifications. The largest group was classified as Locally Integrated (31.8%). Wenger (1997) also noted that this type of network is the most common and most robust in the UK. The smallest group (5.1%) are Family Dependent and Wenger noted that this group is at risk of family and carer stress and increasing isolation in older age.

Health

Mental and physical health were assessed with the Medical Outcomes Study Short Form (SF-12, Ware, Kosinski, & Keller, 1995). The SF-12 comprises self-ratings of general mental health, vitality, limitations in physical and social activities, role limitations due to emotional problems, and perceptions of bodily pain. Using normed New Zealand data, summary scores for mental and physical health were constructed so that each scale has a theoretical range of 0-100 and a sample mean of 50.

Statistical tests showed no significant differences in physical health according to the five different network types. However, Figure 2 shows that the participants' self-ratings of mental health differed significantly according to network type ($p<.001$). Those classified as Private reported lower mean mental health scores ($M=47.3$) compared to those classified as Locally Integrated ($M=50.6$), Local Self-Contained ($M=49.0$) and Wider Community-focused ($M=50.5$, $SD=6.5$). In contrast, the Locally Integrated and Wider Community-focused groups reported significantly better mental health than the other three, relatively isolated groups.
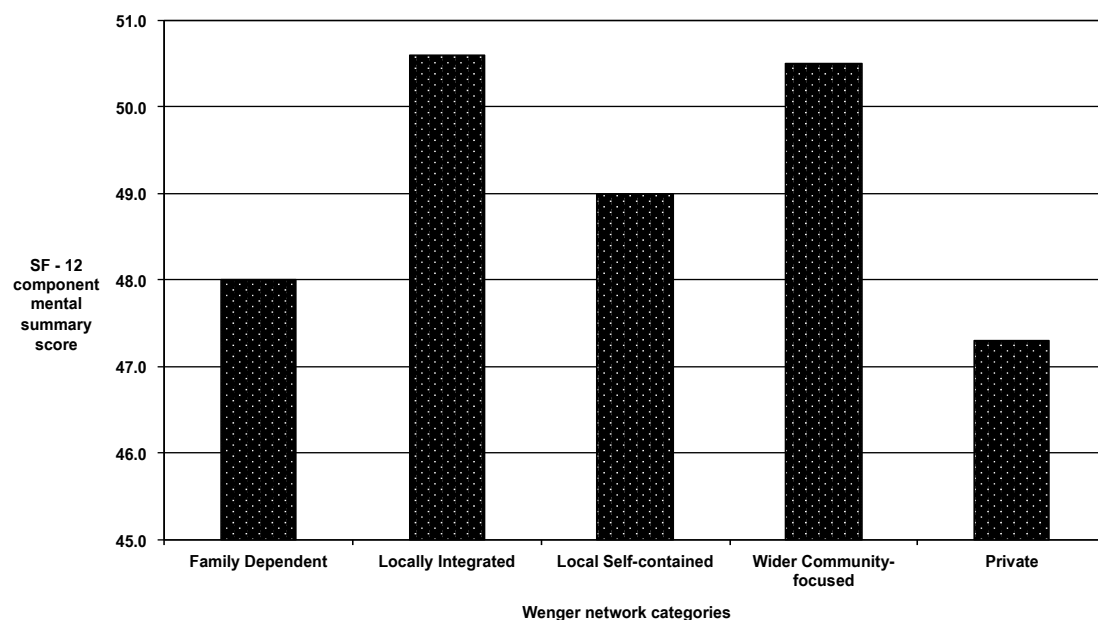
Figure 2. SF-12 mental health summary score according to network type.

Although respondents belonging to the Private group represent only 14% of the total sample, it is of concern that they are already describing social participation patterns that are related to poorer mental health in old age. This pattern suggests that early poor health may contribute to restricted social participation. Wenger (1997) suggested that older people with this type of network are less likely to be in good

health and face increasing isolation and problems. People who fall within the Private network type are most at risk in older age for increasing mental illness and poor adaptation to assistance. Furthermore, although (as in the New Zealand sample) it is the least numerous support network type in the UK, it is dominant in social work caseloads. The increasing predominance of private networks among this younger group may be a cohort effect. That is, more private networks may be a growing characteristic of western society. While this network type may not affect physical health in younger old age as shown in the NZLSA sample, researchers (e.g. Litwin & Shiovitz-Ezra, 2006; Wenger, 1997) have shown that this type of network is the least protective in later years.

Quality of Life

Quality of life was measured with a shortened version of the CASP-19 (Hyde, Wiggins, Higgs, & Blane, 2003), which was designed for older populations. The scale assesses satisfaction in areas of "Control" (e.g. My age prevents me from doing the things I would like to), "Autonomy" (e.g. I feel that my life has meaning), "Self-realisation (e.g. I feel like life is full of opportunities), and "Pleasure" (e.g. I feel full of energy these days). Scores ranged from 0 to 36 with higher scores representing better quality of life. The relationship between quality of life and network categorisation was statistically significant ($p<.001$) and showed a similar pattern to mental health[2]. Figure 3 shows that those in Locally Integrated and Wider Community-focused networks reported better quality of life than the remaining three groups. Those in Private social networks reported lower quality of life than all but the Family Dependent group.
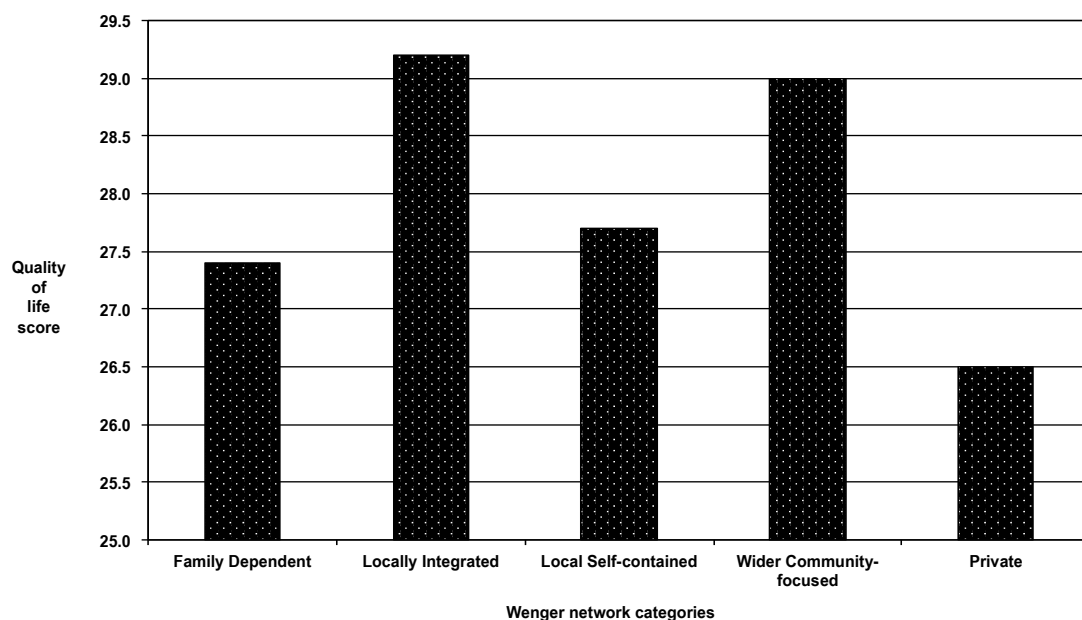

Figure 3. Quality of life according to network type.

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[2] Means and standard deviations for quality of life and the other indicators of social integration are presented in Appendix 1.

Age

NZLSA participants were categorised into three different age groups: 48-59 (33.3%); 60-69 (43.2%); and 70-90 years (23.4%). Figure 4 shows that those aged 70 to 90 were more likely to be classified as Locally Integrated (36.1%) compared to those aged 48 to 59 (29.1%) and those aged 60 to 69 (31.8%). A similar pattern was evident for those classified as Wider Community-focused. Conversely, those in the youngest age group were more likely to be classified as Family Dependent or Private. Decreases in these types of networks with increasing age, support the suggestion of a cohort effect for Family Dependent, Wider Community-Focused and Private networks. Ajrouch, Blandon and Antonucci (2005) also found that older groups reported older social networks, but fewer geographically proximal networks. Nevertheless, these data suggest that the older group have greater representation in social networks that promote health and quality of life: Locally Integrated and Wider Community-focused.
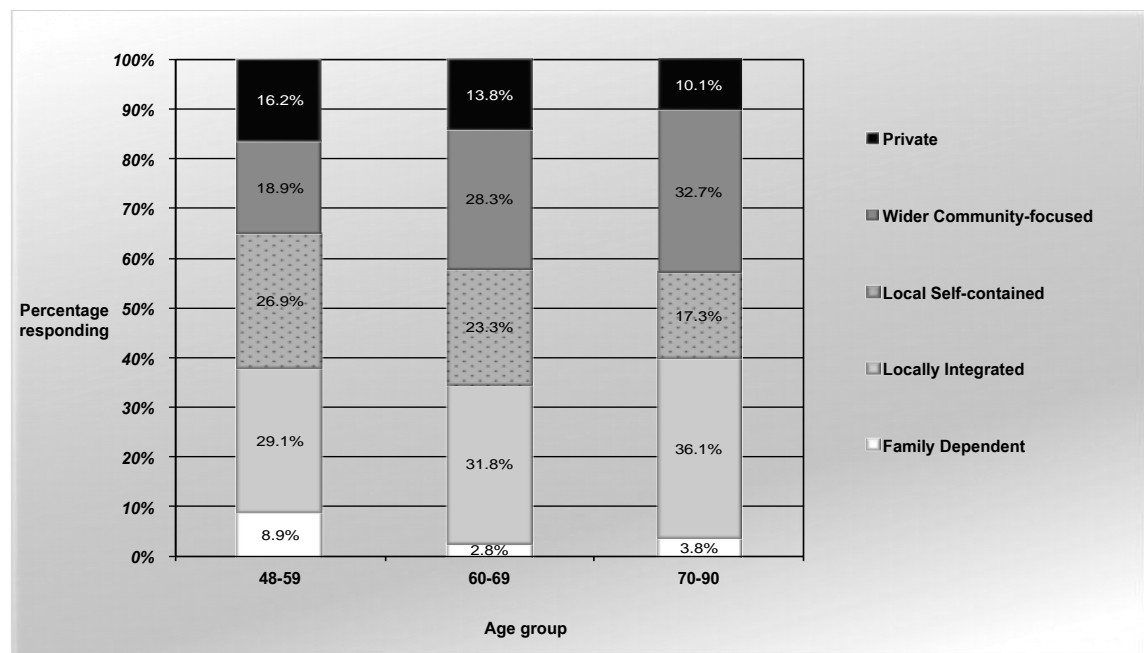
Figure 4. Network type according to age group.

Retirement Status

NZLSA participants were divided into three categories based on their retirement status: Not retired at all (33.6%); partly retired (20.4%); and fully retired (46%).

Statistical analysis indicated that retirement status was associated with network categorisation (see Figure 5). Those in full-time work were more likely to be classified as Local Self-contained (29.9%) compared to the partly retired (21.3%) and fully retired (23.2%, $p<.001$). In contrast, full-time workers were less likely to be classified as Wider Community-focused compared to the other two groups. One explanation for this finding is that retirement allows people more time to interact with their wider community while the time-commitments of work keep social networks relatively small. However, it should be noted that age was more strongly associated

with network categorisation than retirement status, suggesting that the transition into retirement may only partly explain age-related differences in social networks.
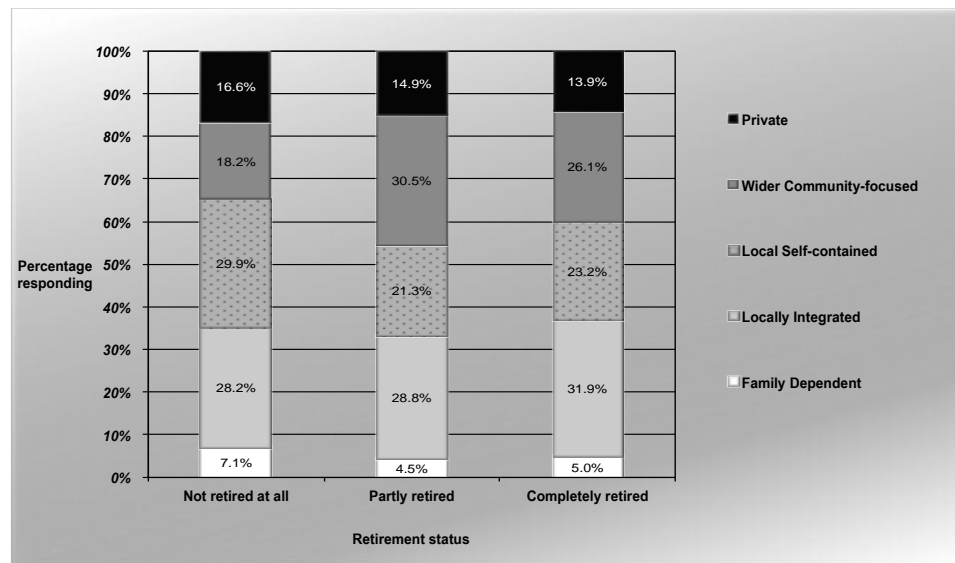
Figure 5. Network type according to retirement status

Gender

Among older adults, different social network types have been related to decline in cognition and physical functioning and these effects are different for men and women (e.g. Unger et al., 1999; Zunzunegui, et al., 2003). Ajrouch et al., (2005) found differences in the size and type of men's and women's networks across age groups from young-old to elderly. Among the NZLSA sample, the gender differences in network categorisation were small but statistically significant ($p<.001$). As seen in Figure 6, women were more likely than men to be classified as Locally Integrated (33.8% versus 29.2%) while men were more likely to be classified as Locally Self-contained (26.2% versus 20.5%). In other words, there was a tendency for men to have networks focused primarily on neighbours and for women to have more extensive networks focused on local family and friends as well as neighbours.
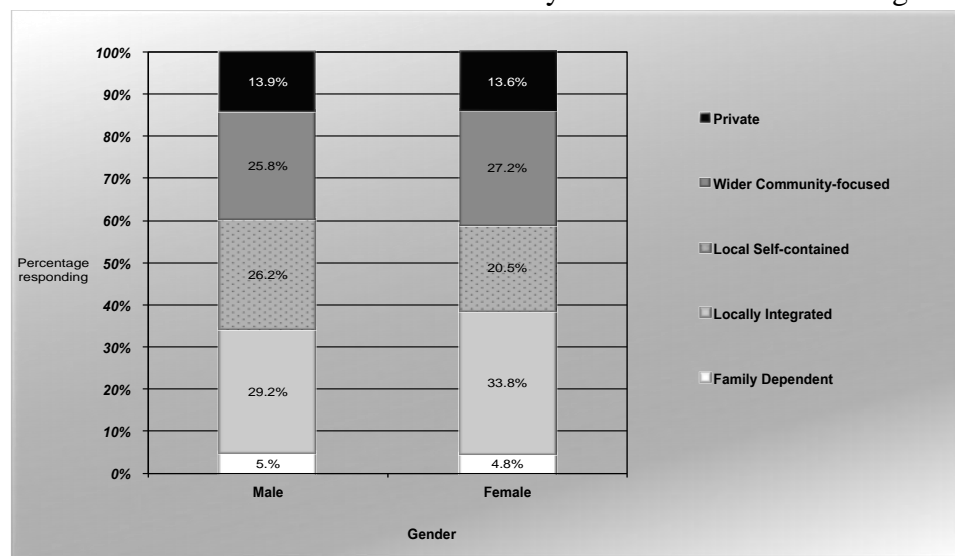
Figure 6. Network type according to gender.

Ethnicity

Litwin & Shiovitz-Ezra (2006) have also pointed to the relevance of culture when considering social networks and differences in ethnicity may reflect cultural differences. Figure 7 shows the differences for each ethnic group in the NZLSA sample by the percentage reporting different network types. The groups comprise those identifying as European only (63.5%), both European and Māori (17.1%), Māori only (14.7%) and Other (4.7%). The last group includes those of Pacific, Asian, and South American decent (numbers too small to meaningfully differentiate by group). An examination of the relationship between ethnic group and network type showed that there was a significant association between ethnicity and network categorisation ($p<.001$). For example, those identifying as Māori and European were more likely to be categorised as Family Dependent (7.9%) compared to those identifying as Māori (7.0%) and European (4.6%) only[3]. Similar results were found for the Private social network. In addition, those identifying as European/Māori were more likely to be classified as Locally Integrated (46.9%) compared to the other two groups. The Locally Integrated network, which includes close relationships with local family, friends and neighbours, was the most common for the European, Māori, and Māori and European ethnic groups.
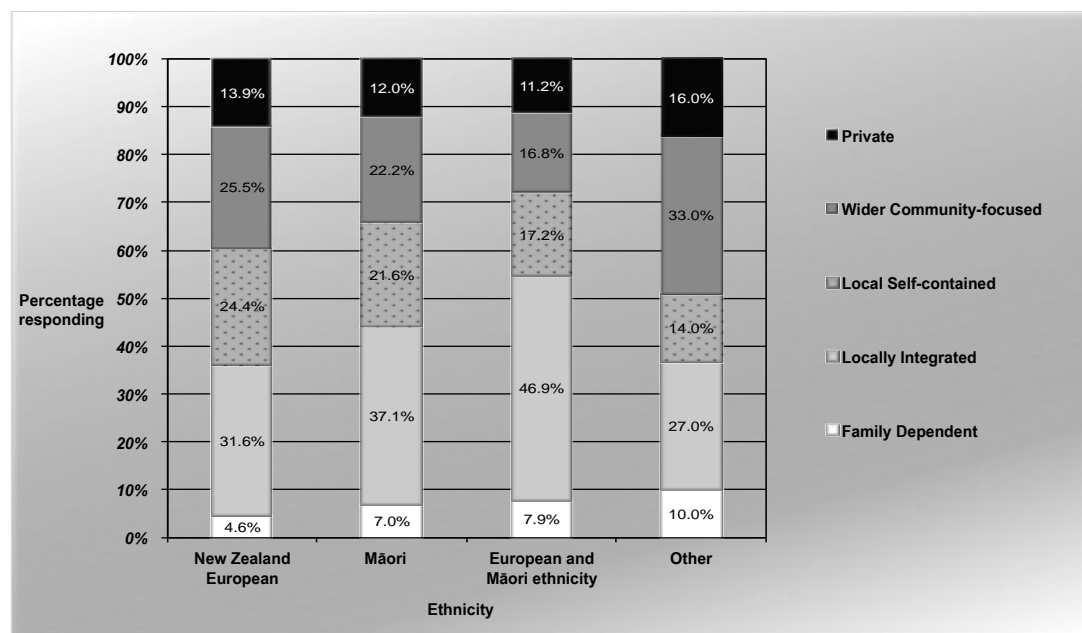
Figure 7. Network type according to ethnicity.

Marital Status

Marriage is an important form of structural social support (e.g. Unger at al., 1999) and is an important determinant of network structure (Litwin & Shiovitz-Ezra, 2011).

Our findings show diverse patterns in network structure according to marital status ($p<.001$). For example, approximately 44% of widowers were classified as

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[3] Results for Other ethnicities should be taken with caution due to the diversity of ethnicities within this group.

Locally Integrated compared to only 17% of those in Civil Unions or De facto relationships. Of those who had never married, approximately 31% were classified in private networks compared to only 11.5% of married participants and 7.5% of widowers.

Figure 8 shows no clear pattern when comparing those with partners and those without, indicating that both groups are diverse in terms of their network structures. However, these results should be treated cautiously due to the small sample size for the Civil Union/De facto and Single/Never married groups.
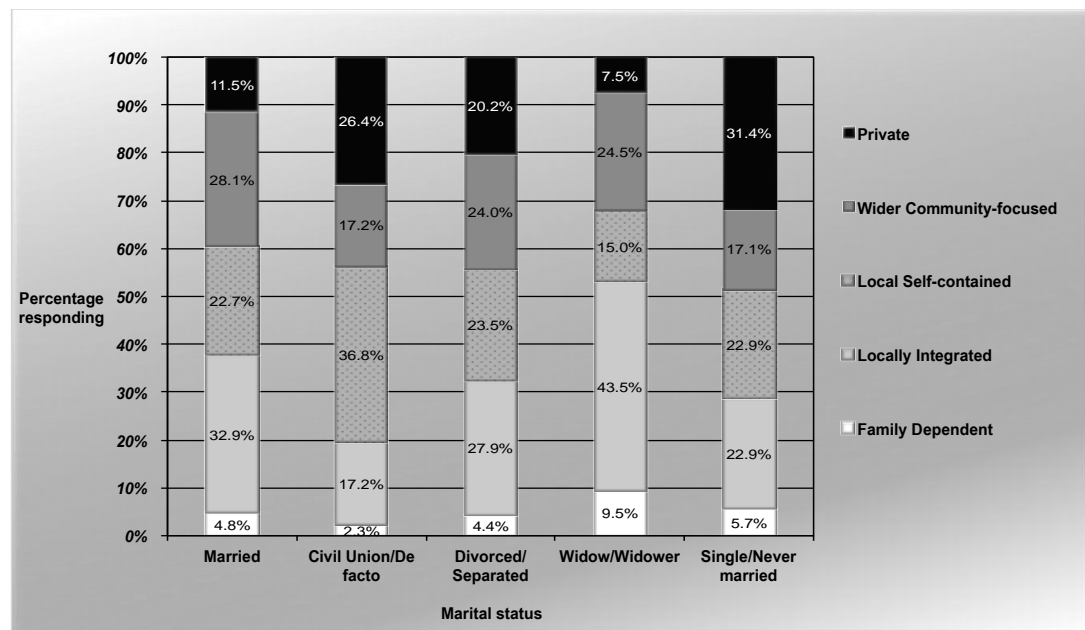
Figure 8. Network type according to marital status.

Socioeconomic Status

Berkman et al., (2000) present a conceptual model of social relationships and health in which social networks are understood as part of a wider social and cultural context including the structural effects of SES. Ajrouch et al. (2005) showed that across different age groups from 40 to 90-plus years, measures of SES have direct effects on personal networks, although these effects are different for measures of SES such as education and occupation. In the NZLSA data, there were also differential effects for different indicators of SES, in this case, household income, educational qualifications and economic living standards.

Figure 9 shows a non-linear pattern of difference across the network types according to household income. For example, individuals with household incomes between $50,000 and $75,000 were less likely to be categorised in the Private network (10%) compared to those with both higher and lower levels of household income. Those earning $25,000 to $50,000 were the least likely of all the income groups to be classified as Local Self-contained.
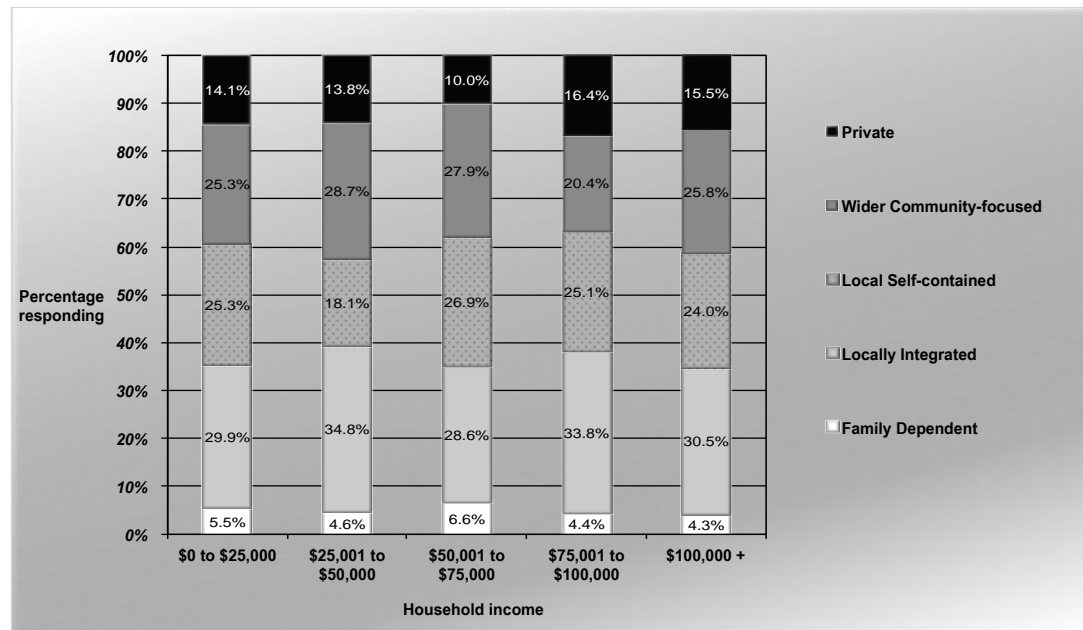
Figure 9. Network type according to household income.

Figure 10 shows the differences in network type according to educational qualifications (*p*<.01). The Locally Integrated network type was generally the most common across all levels of educational qualification with group membership ranging from 31.3% for secondary qualification to 35.9% for those with no high school qualification. Although the relationship was weak, increasing educational qualifications was associated with the increasing likelihood of being classified as Wider Community-focused and the decreasing likelihood of being classified as Private.
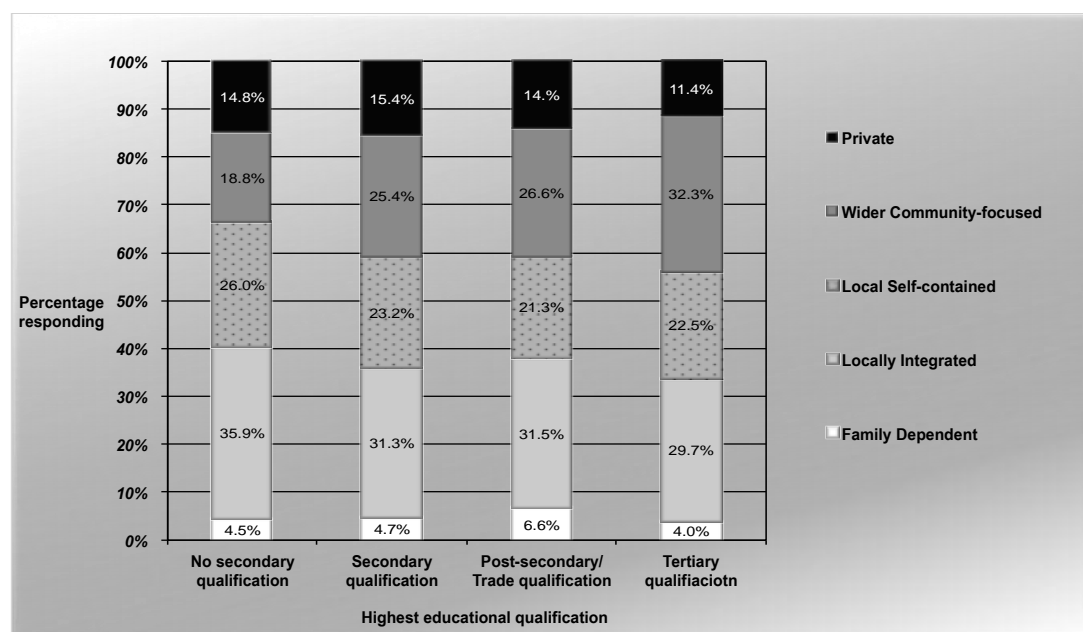
Figure 10. Network type according educational qualifications.

The participants' self-assessed economic living standards were used as a further indicator of socioeconomic status. The Economic Living Standards Index (ELSI) was developed by New Zealand researchers (Jenson, Spittal, & Krishnan, 2005) to assess restrictions in the ownership of household items, economic-based restrictions in social participation and the extent of economising to reduce daily living costs. Three questions on self-rated material standard of living were also included in the ELSI. Scores ranged from 0 to 31 with higher scores reflecting higher standard of living. The average ELSI score for the NZLSA was 23.9 and the standard deviation was 6.2. This suggests that in 2010 the majority of the sample had reasonably good living standards, but that a substantial minority were living in less favourable circumstances. Figure 11 shows small but significant differences in economic living standards according to network type ($p<.001$). Those in Family Dependent networks reported lower living standards than all but those categorised as Private. These findings suggest that economic living standards and education may be more informative determinants of social network type than household income.

Figure 11. Network type according to economic living standards.

Perceived Social Support

Social support has been conceptualised in terms of both emotional and instrumental aspects of support. Wenger (1997) described instrumental support as providing access to the practical resources that help people to function well in old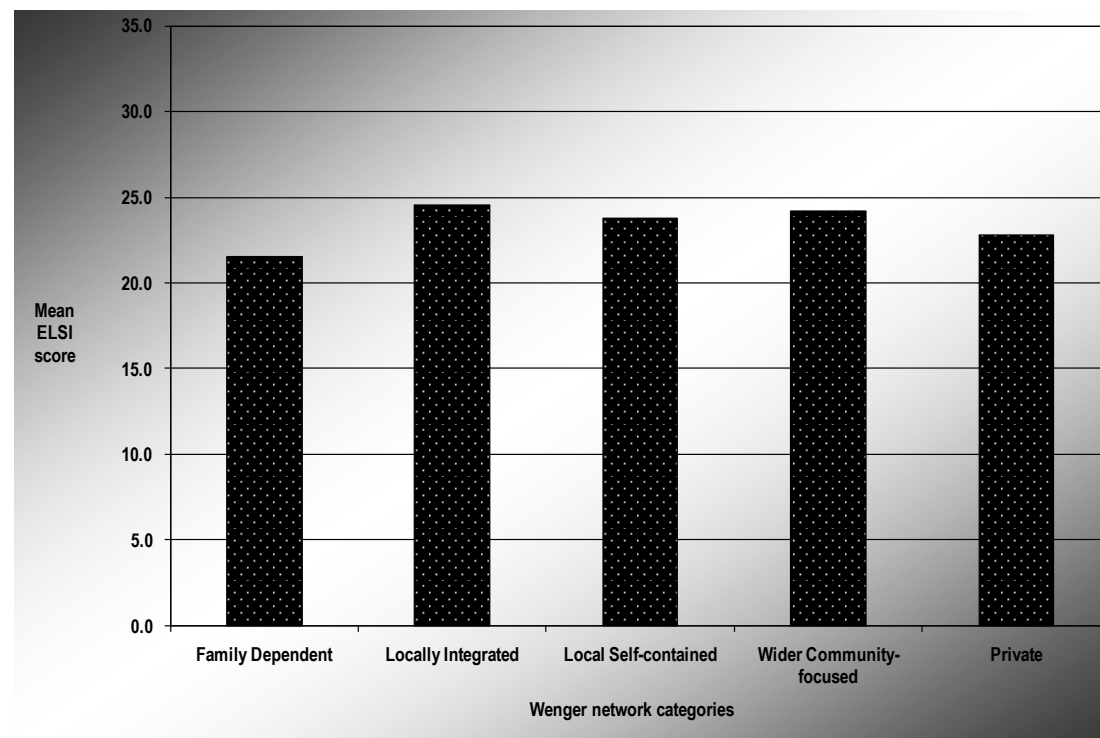er age. In applied areas of health or social welfare, social network types may be seen as a useful way to examine the provision of instrumental support.

At a more intimate level, emotional support has also been shown to have powerful effects on health (Berkman, 2000; Seeman et al., 2001). Emotional support is best measured as subjective perceptions of support that takes account of whether a person perceives that the members of their network are actually supportive. The NZLSA used the Social Provisions Scale (Cutrona & Russell, 1987) to measure this type of perceived social support. This measure has six sub-scales that measure separate but highly correlated perceptions of support. In the NZLSA sample scores on these sub-scales (see Table 1) showed high internal reliability ($\alpha = .87$) and were summed to form a total social support score. The distribution of these scores indicates that most people reported high levels of social support.

Table 1
Mean scores for the NZLSA sample on each subscale of the social provisions measure of perceived social support.

	Reliable alliance	Attachment	Guidance	Opportunity for nurturance	Social integration	Reassurance of worth
N	3216	3179	3201	3185	3160	3157
Mean	14.10	13.39	13.62	12.29	13.20	13.69
SD	1.93	2.25	2.14	2.40	1.99	2.12

Perceptions of social support were associated with network type (see Figure 12). The mean social support scores for those classified as Private were significantly lower than for the other four groups (*p*<.001). In contrast, social support scores for the Locally Integrated and Wider Community-focused were higher than for the other three groups (*p*<.001). This indicates that more extensive networks, as opposed to those focused largely on family or a very small group of neighbours, are associated with relatively stronger perceptions of receiving social support. This may seem counter-intuitive since families and close friends are often expected to provide the most emotional support. However, this finding supports international findings which show that support from families or restricted networks only is not always positive.
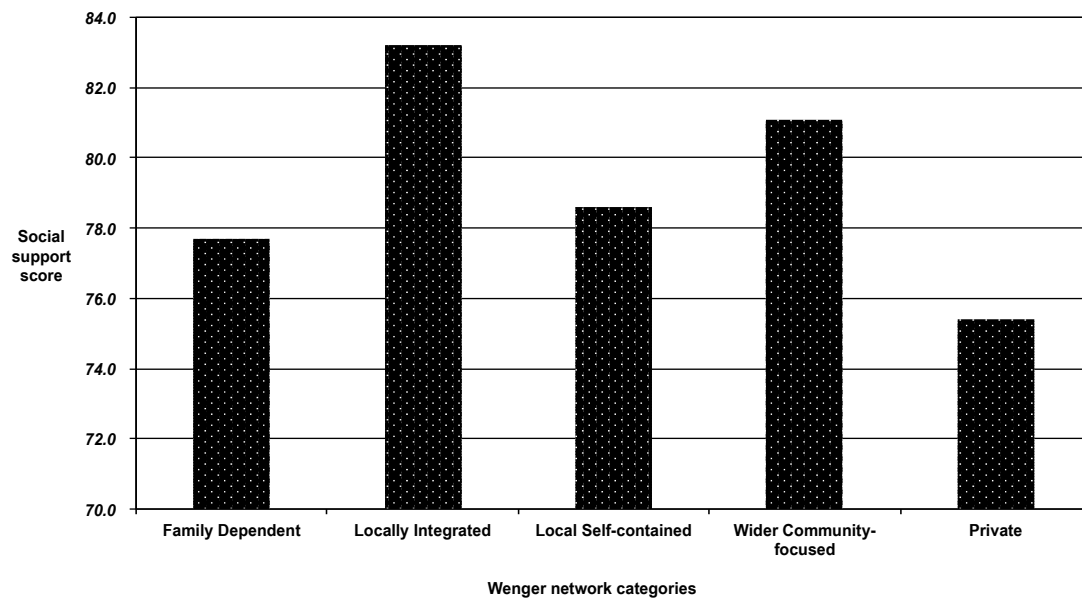
Figure 12. Mean social support scores according to network type.

Health and Quality of Life

Social support was weakly related to physical health (r = .21, *p*<.001) and slightly more strongly to reports of mental health (r = .38, *p*<.001) in the NZLSA data. There was also a moderate-to-strong correlation of r=.52 (*p*<.001) between social support and quality of life. These findings imply that an increase in social support is more strongly associated with improving quality of life rather than improving health status.

Age, Retirement, Ethnicity and Gender

There were clear patterns in the relationships between social support scores and age, retirement, ethnicity and gender: demographic factors that have been shown to be reliably related to health. Figures 13 and 14 show that perceptions of social support diminish slightly as people age (*p*<.001) and as they move into retirement (*p*<.001). According to Figure 15, Māori and those with other non-European ethnicities report poorer social support than Europeans and those identifying as both European and Māori (*p*<.001). However, men and women reported similar levels of social support (M= 79.8 and 80.2 respectively).
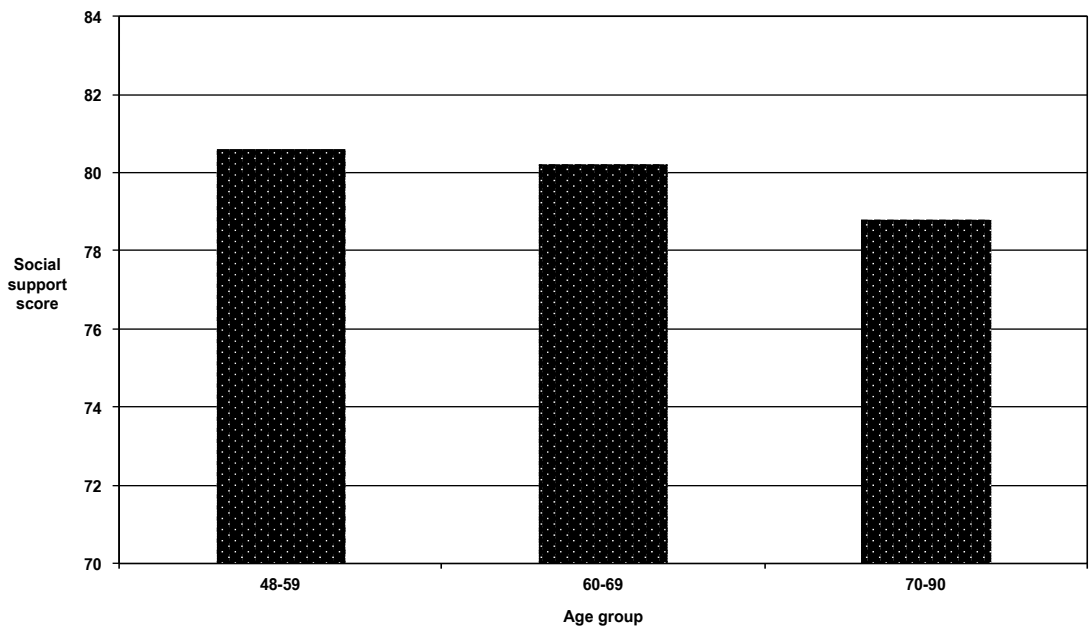
Figure 13. Mean social support scores according to age group.
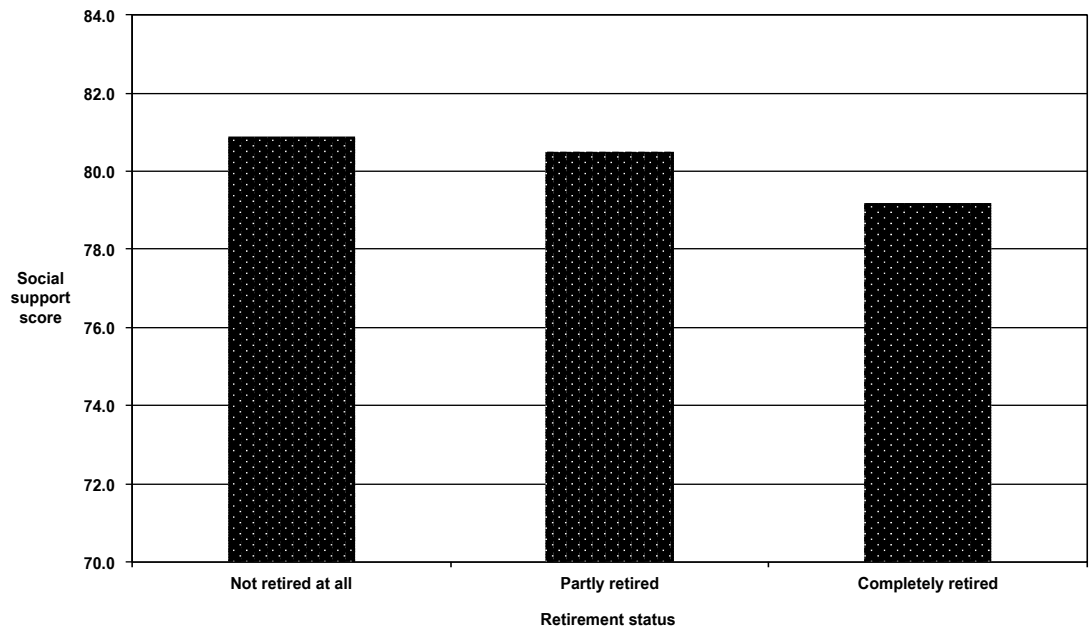
Figure 14. Mean social support scores according to retirement status.
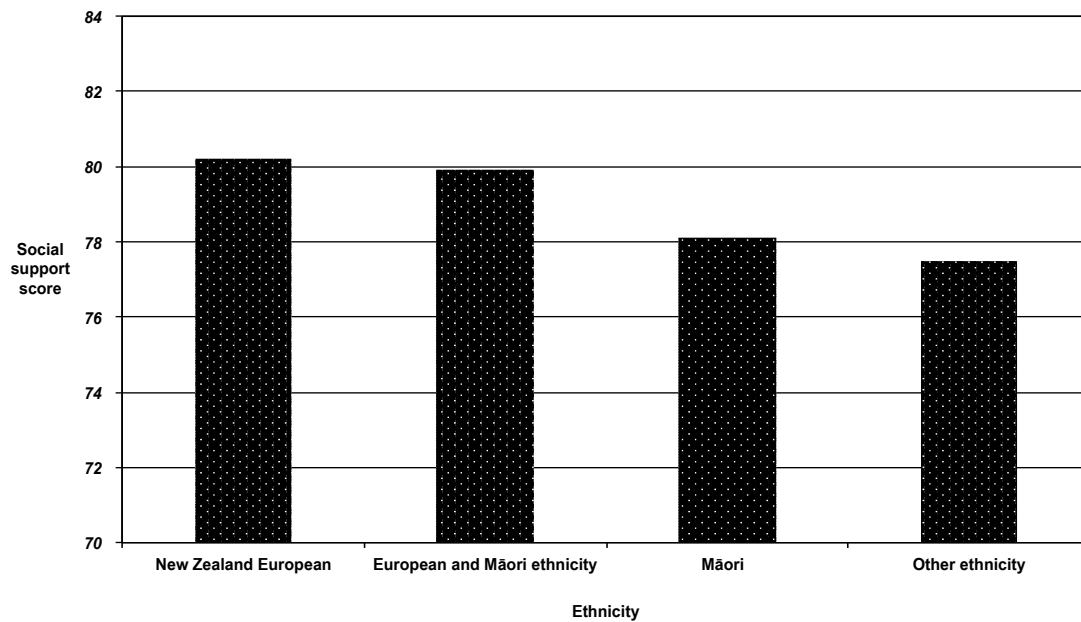
Figure 15. Mean social support scores reported for each ethnic group.

Socioeconomic Status

Figures 16 and 17 show that perceived support increases with increasing household income (*p*<.001) and levels of educational qualifications (*p*<.001). The small-to-moderate positive correlation between social support and economic living standards (r=.37, *p*<.001) shows that social support also diminishes with economic living standards. Reduced access to social participation due to financial constraints may therefore have an important negative impact on perceived levels of social support.

Figure 16. Mean social support scores according household income.

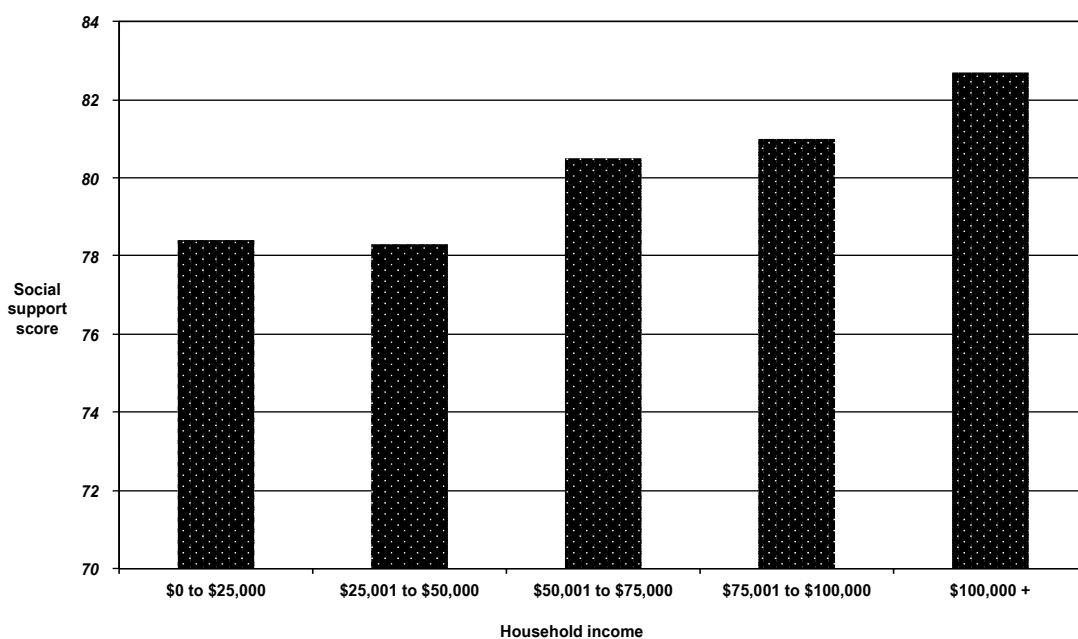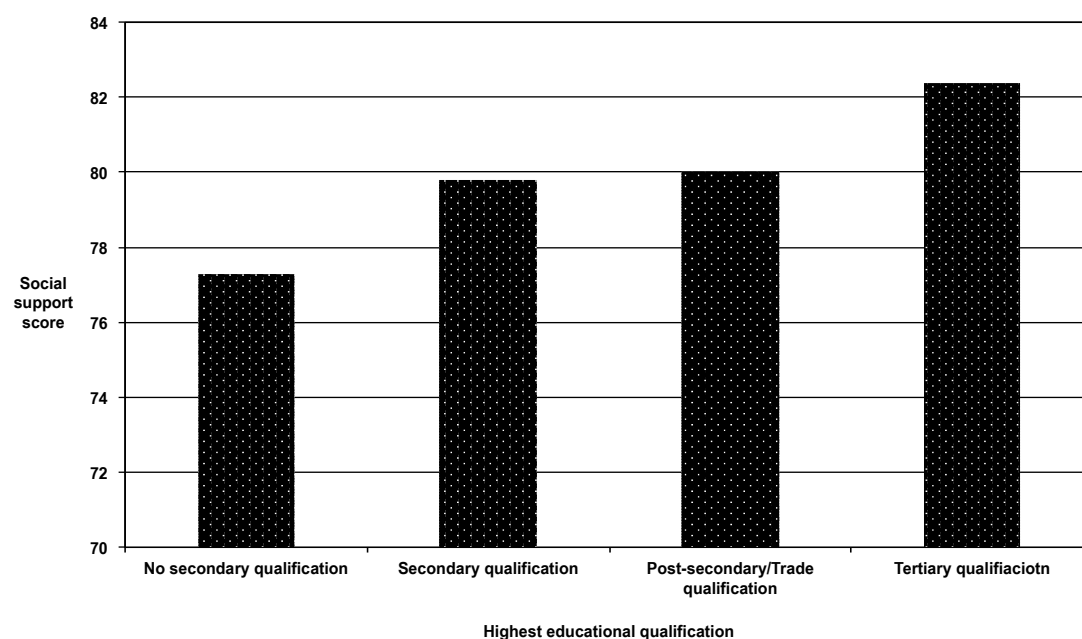*Figure 17.* Mean social support scores according to education.

Social Connectedness

Measures of social connectedness have been used in the New Zealand Quality of Life survey (TNS, 2007) and cited in other Ministry of Social Development Reports (e.g. MSD, 2007) to indicate the levels of connectedness among the New Zealand population in major cities and among older people (MSD, 2007a). This report focuses on two indicators of (dis)connectedness in the NZLSA survey: loneliness and discrimination. Together, these indicators are seen to "measure the opportunities for and the actual levels of connection between people, both within their immediate social groups and within the wider community" (MSD, 2007). This final section examines how network structure and social support play a role in shaping people's feelings of isolation and their experiences with discrimination. The social outcomes of loneliness and discrimination are then examined in terms of their associations with mental and physical health, quality of life, age, retirement, ethnicity, gender, and socioeconomic status.

Loneliness

NZLSA participants were asked 11 of questions about their social and emotional loneliness including their experiences of general emptiness, the people they feel close to, and how often they feel rejected (de Jong Gierveld, van Groenou, Hoogendoorn, & Smit, 2009). Their responses were originally categorised to form four groups: not lonely (48.8%); moderately lonely (41.2%); severely lonely (7%); and very severely lonely (3%). The last two groups were combined and labelled "very lonely".

As anticipated, individuals classified as belonging to Private networks contained a larger proportion of very lonely people (23.3%) compared to the other

four network categorisations (p<.001, see Figure 18). Conversely, the Locally Integrated network type included a higher proportion of people who were not lonely (59.9%) compared to the other network types. Although some network types include more people who report loneliness, the types of relationships and interactions in people's lives do not completely explain their feelings of loneliness. For example, private restricted networks also include 33% of people who report no loneliness.
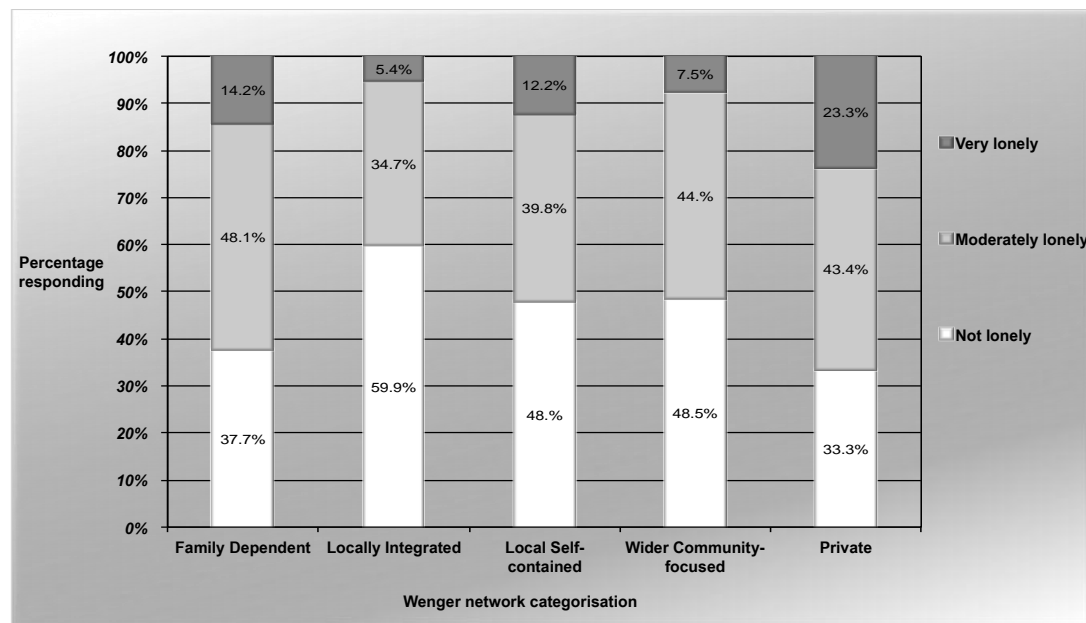
Figure 18. Wenger network type according to loneliness.

Feelings of loneliness were more strongly related to lack of social support (*p*<.001). As seen in figure 19, those who felt the loneliest exhibited mean social support scores that were almost 20 points lower (mean=66.5) than those who did not feel lonely at all (mean = 84.8). Thus, perceptions of social support itself, may play a vital role in people's feelings of social connectedness.
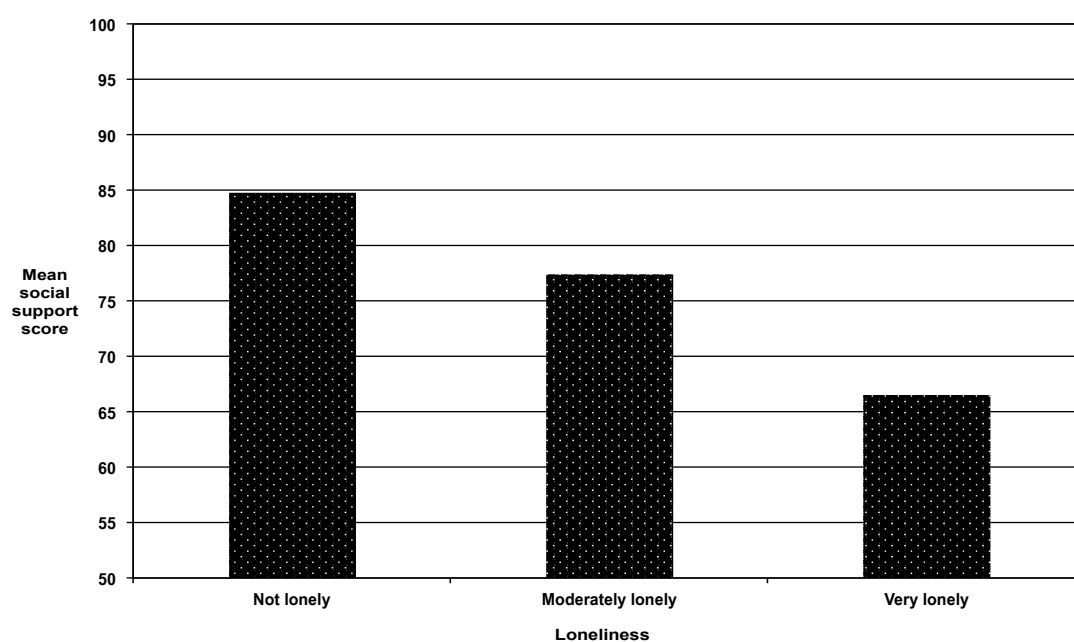
Figure 19. Mean social support scores according to loneliness.

Health and Quality Of Life

Increasing loneliness was associated with lower levels of both physical and mental health ($p<.001$). The average physical health scores for those reporting the highest level of loneliness (M=46.8) was 4.5 points lower than those reporting no loneliness (M=51.0, Figure 20). However, the discrepancy in average mental health scores between the two extremes of loneliness was 10 points—approximately twice the discrepancy shown for physical health (see Figure 21). This indicates that loneliness has a stronger association with mental health than with physical health. Quality of life also decreased steeply with increasing levels of loneliness as indicated by Figure 22 ($p<.001$).
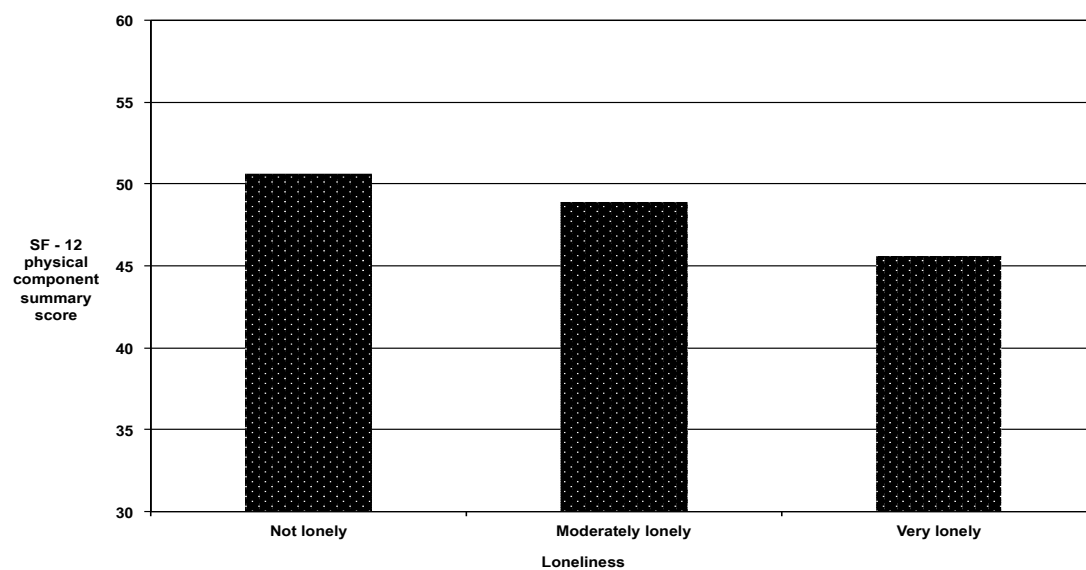
Figure 20. Mean physical health scores according to loneliness.
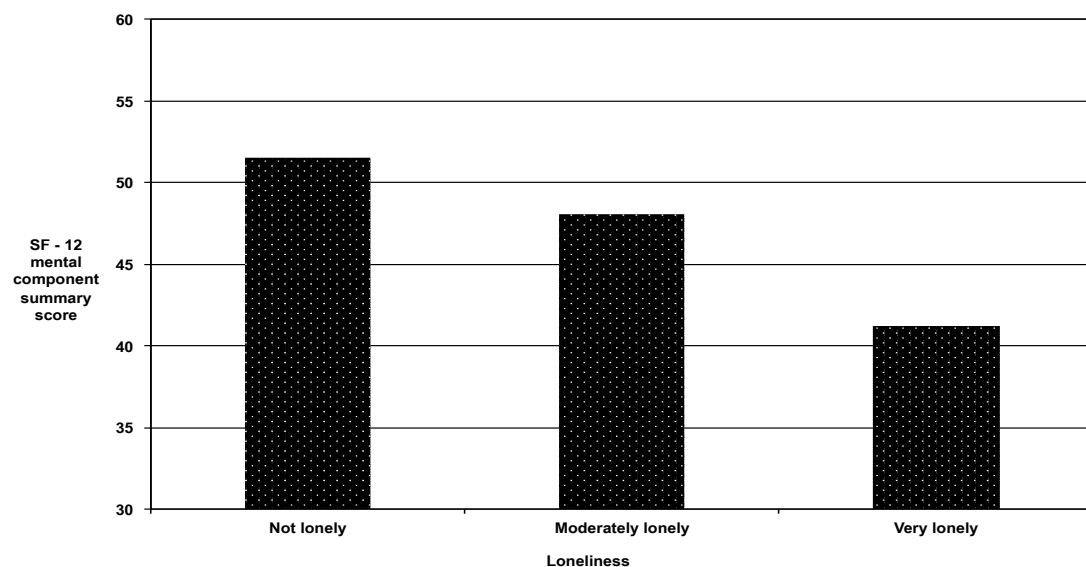
Figure 21. Mean mental health scores according to loneliness.
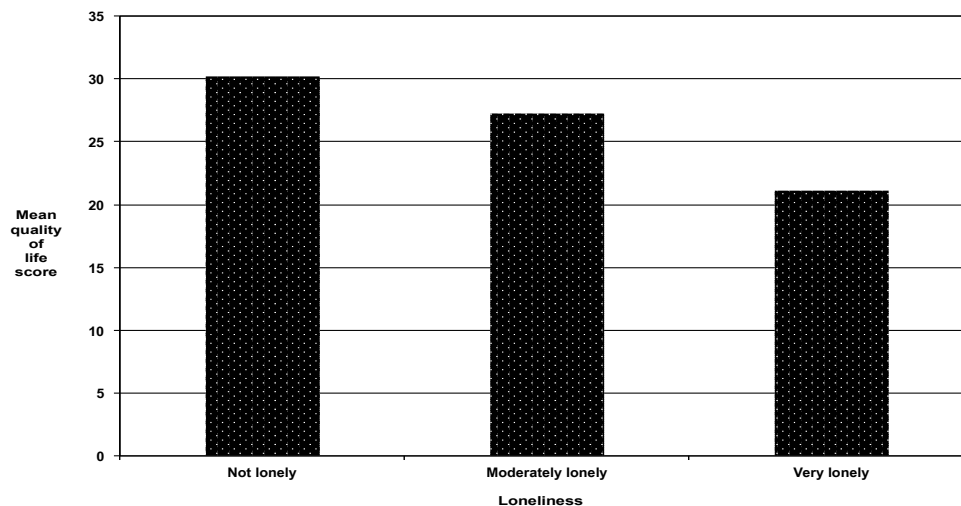
Figure 22. Mean quality of life score according to loneliness.

Age, Retirement, Gender, and Marital Status

Figures 23 to 25 illustrate the statistically significant relationships between loneliness and age, gender, and marital status respectively. In regard to age, contrary to common understandings, Figure 23 shows that loneliness *decreases* with increasing age. Of those aged 70-90 only 6.6% were categorised as very lonely compared to 11.3% of those aged 48-59 ($p<.01$).

There is also a common expectation that loneliness will increase with loss of work connections. However, participants' perceived levels of loneliness did not vary across those working full-time, part-time or those who were fully retired. Together, these findings indicate that the ageing experience and the transition to retirement do not necessarily lead to greater loneliness. It may be that individuals develop alternative supportive networks after leaving the workforce or that work-based social networks do not necessarily equate with greater support, health or better social outcomes. Indeed, Figure 4 on page 10 showed that the older participants were more likely to be categorised in relatively large social networks (e.g. Wider Community-focused) compared to the younger participants.
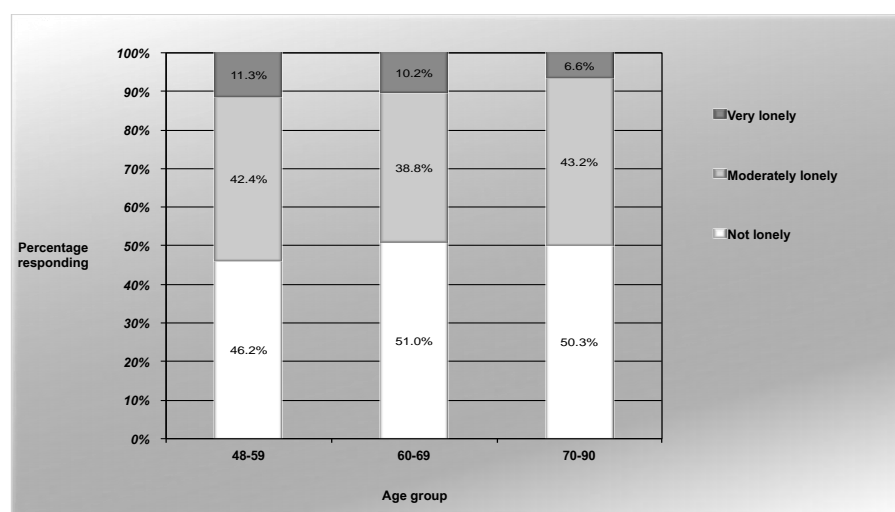
Figure 23. Loneliness according to age group.
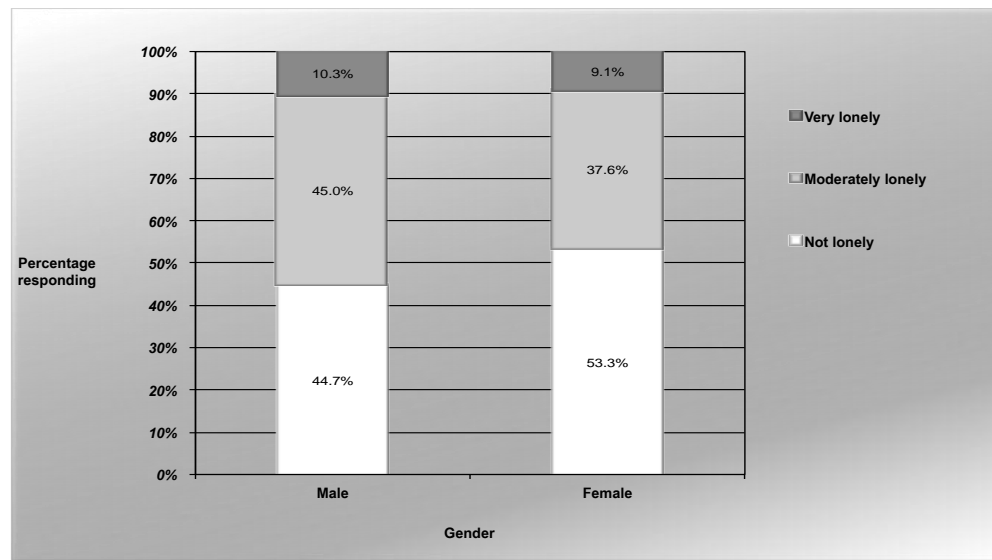
Figure 24. Loneliness according to gender.
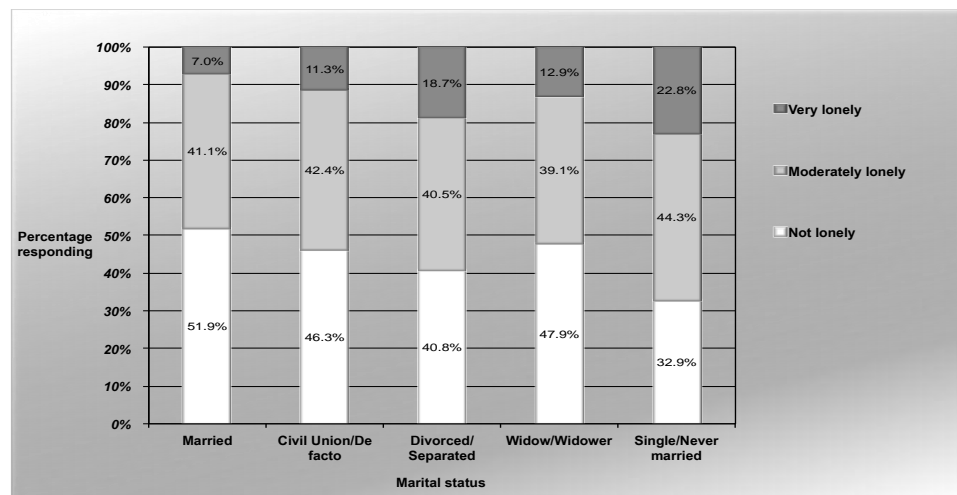
Figure 25. Loneliness according to marital status.

Socioeconomic Status

        Figures 26 and 27 show small but statistically significant relationships
between loneliness and household income and between loneliness and education
respectively. Only 6% of the highest income group ($100,000+ per annum) reported
being very lonely compared to between 10.2% and 12.7% of the other income groups
(*p*=.01). Education was associated with loneliness (p<.01) but a clear linear pattern
was not evident. For instance, those with a post-secondary or trade qualification were
the least lonely compared to those with both lower and higher qualifications. In
contrast, economic living standards showed a much stronger and clearer relationship
with loneliness (*p*<.001). Figure 28 shows that the loneliest participants scored
approximately seven points lower on the ELSI scale (18.7) compared to the least
lonely (25.6). This finding is perhaps not surprising given that the ELSI index
assesses affordability of communication technology (e.g. telephone, internet) and the
affordability of socialising (e.g. going out for dinner, hobbies). As such, self-

perceptions of economic living standards are perhaps more informative in elucidating the economic aspects of social integration compared to income and education.

Housing ownership was also related to loneliness. Those who owned their own home in 2010 were less likely to report loneliness in 2012 ($r= -.08$, $p<.001$). This small but significant association (which is linked to economic living standards) provides a possible focus for concern, future research and intervention.

Figure 24 shows a small but statistically significant relationship between gender and loneliness ($p<.001$). Although a similar proportion of men and women reported being very lonely (10.3% and 9.1% respectively), women were more likely than men to report not being lonely at all (53.3% versus 44.7% respectively). Reported loneliness also differed according to marital status. Those who had never been married or had been divorced tended to be lonelier than those who were married, in a de facto relationship or widowed ($p<.001$, Figure 25). Although these results highlight the importance of intimate relationships for structural social support (e.g. Unger at al., 1999), it is important to note that one third of divorcees and single people did not report being lonely at all.
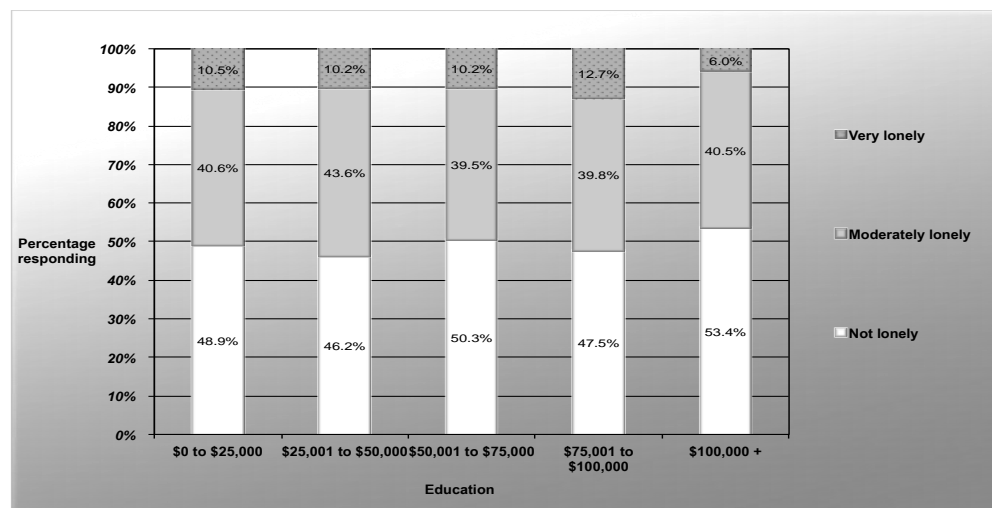

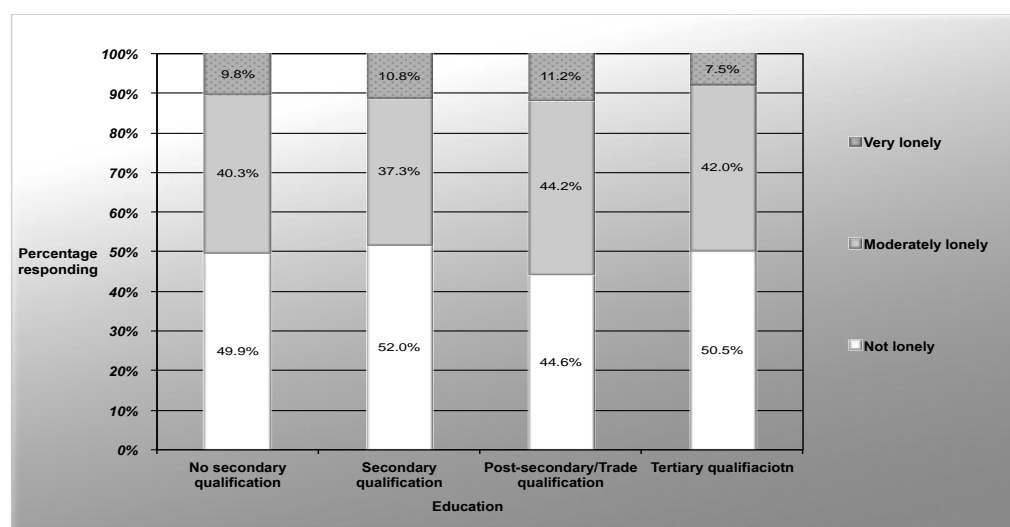*Figure 26.* Loneliness according to household income.

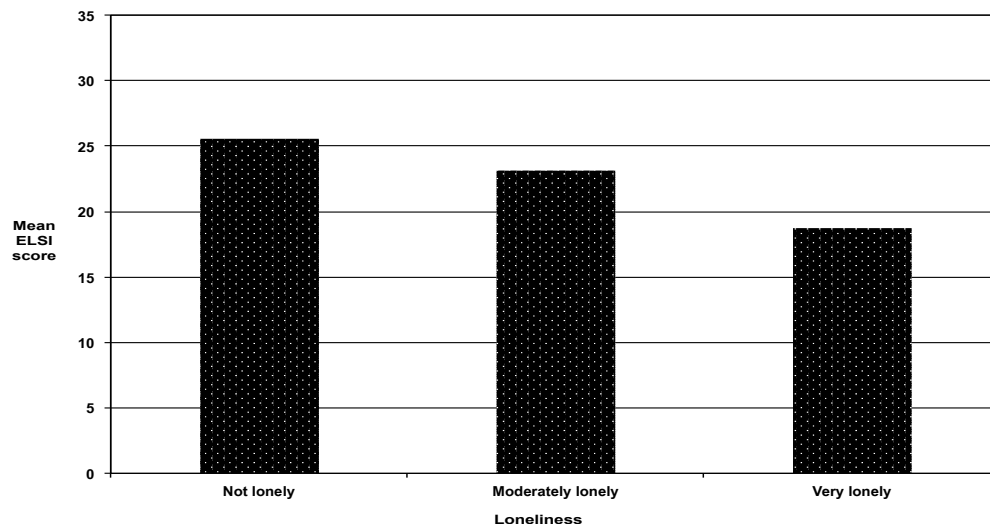*Figure 27.* Loneliness according to education.

Figure 28. Loneliness according to economic living standards.

Discrimination

The NZLSA survey assessed the participants' experiences with everyday discrimination using a scale originally developed in the United States (Williams, Yu, Jackson, & Anderson, 1997). Participants were asked questions about whether they felt people were afraid of them; whether they had been insulted, harassed, or threatened; if they felt other people thought they were not smart; if they had been treated with less respect and courtesy than others; and if they had received poorer service than others at restaurants and stores. Scores ranged from 0 to 25 with higher scores representing greater discrimination. Those scoring zero (42%) were categorised and labeled as "no discrimination", those scoring 1 to 4 (37%) were labeled as "some discrimination" and those scoring between 5 and 25 (21%) were labeled as "higher discrimination". Though not analysed here, the participants were also asked what they felt was the single most important reason for these instances of discrimination. Of those who reported at least some discrimination (N=1154), the most common reason reported was age (63%), followed by "other reason" (24%), then ethnicity (12.7%). Other reasons included gender (9%), disability (4.8%), weight (4.8%), religion (3.0%), health (4.9%), and sexual orientation (2%).

Discrimination may be associated with network categorization in at least two ways. Exposure to discrimination may push people into social networks that reduce the opportunity for further discriminatory experiences. Alternatively, small social networks may shield individuals from the opportunity to be discriminated against. In the NZLSA data, those experiencing high levels of discrimination were more likely to be classified in Private and Family Dependent networks (16.9% and 8.6% respectively) compared to those who had experienced some discrimination or none at all (Figure 29, *p*<.001). This suggests that discrimination pushes people into different types of social networks rather than socially restricted networks providing protection against discrimination.
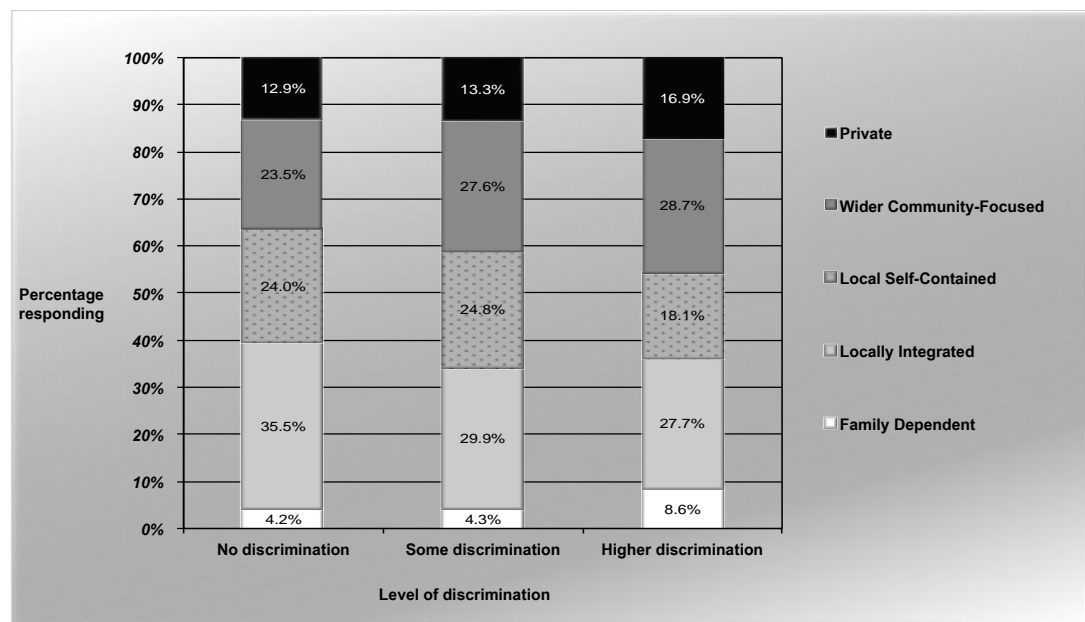
Figure 29. Wenger network type according to perceived discrimination.

Exposure to discrimination may also be reflected in lower levels of social support. Figure 30 shows a non-linear relationship where social support diminishes rapidly for those reporting the highest level of discrimination ($p<.001$).
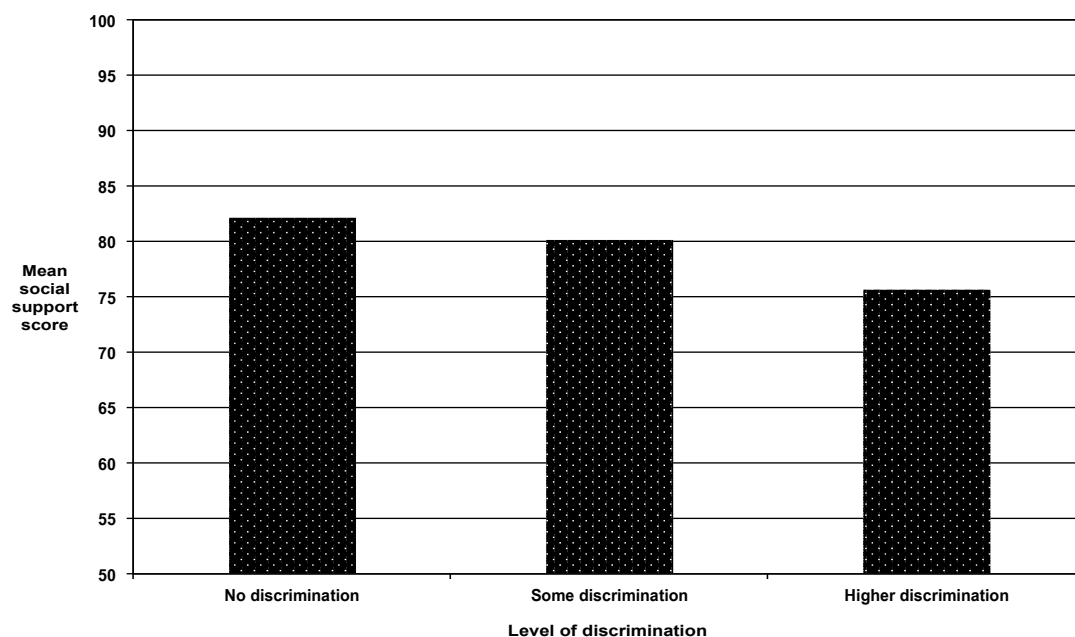
Figure 30. Social support according to level of discrimination.

Health and Quality Of Life

Research indicates that continuous exposure to discrimination can impact negatively on both mental and physical health (Jasinskaja-Lahti, Liebkind, Jaakkola, & Reuter, 2006) and this finding is supported in by the NZLSA data. As shown in Figure 31, levels of physical health did not differ between those experiencing some discrimination or no discrimination. However, the group with the highest exposure to

discrimination reported poorer physical health compared to the other two groups (*p*<.001). The relationship between discrimination and mental health (Figure 32) was more linear compared to Figure 31, with levels of mental health steadily decreasing with exposure to discrimination (*p*<.001). In line with network categorisation, social support and loneliness, discrimination was more strongly associated with mental health than physical health. However, it is possible that some participants were discriminated against *because* of their existing poor physical health. Quality of life also decreased as exposure to discrimination increased (Figure 33, *p*<.001).
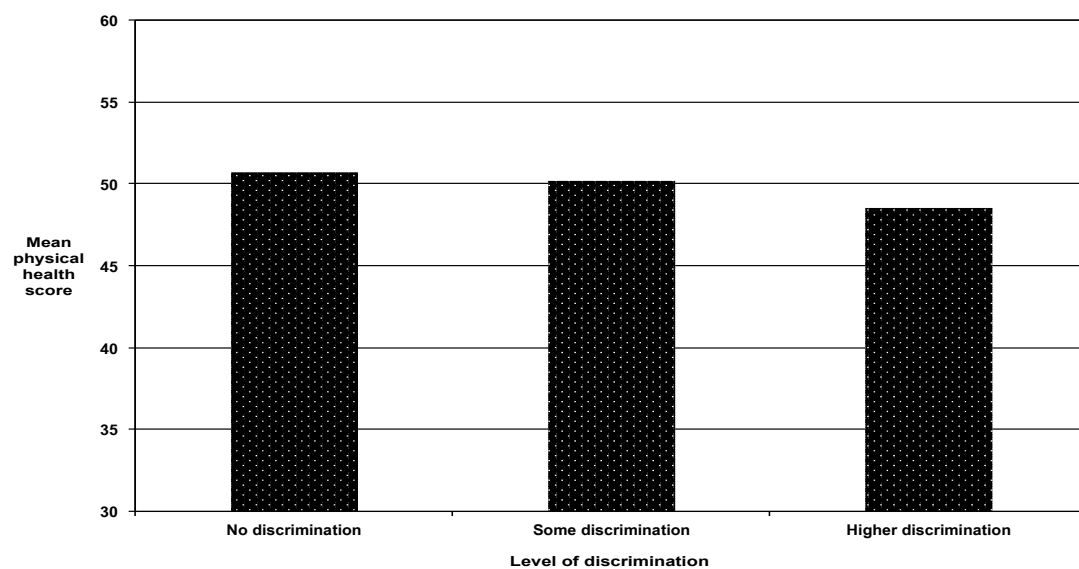
Figure 31. Physical health according to level of discrimination.
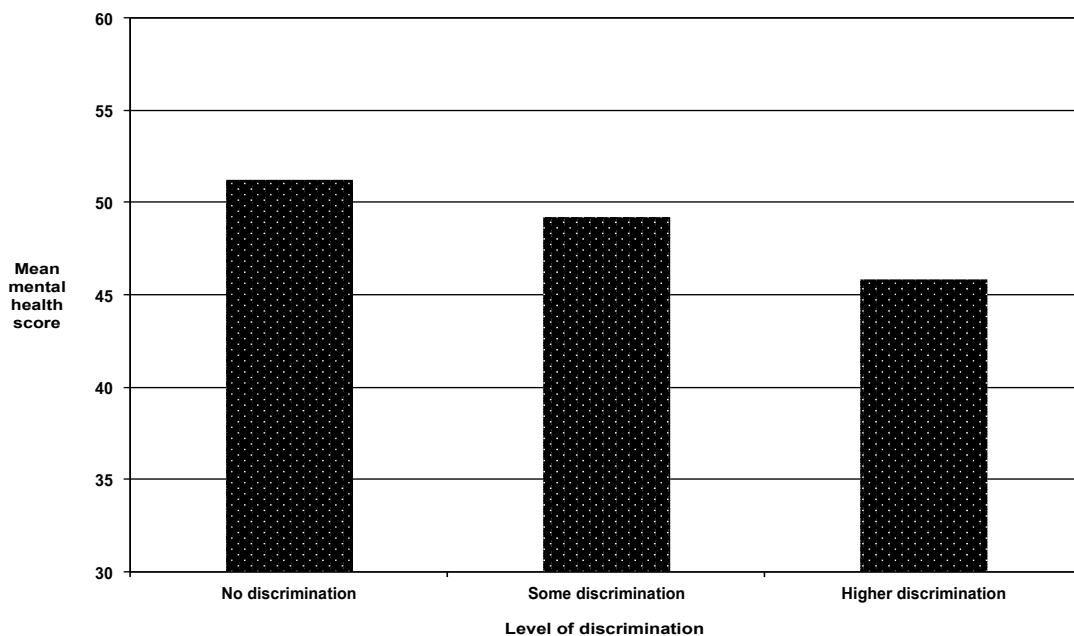
Figure 32. Mental health according to level of discrimination.
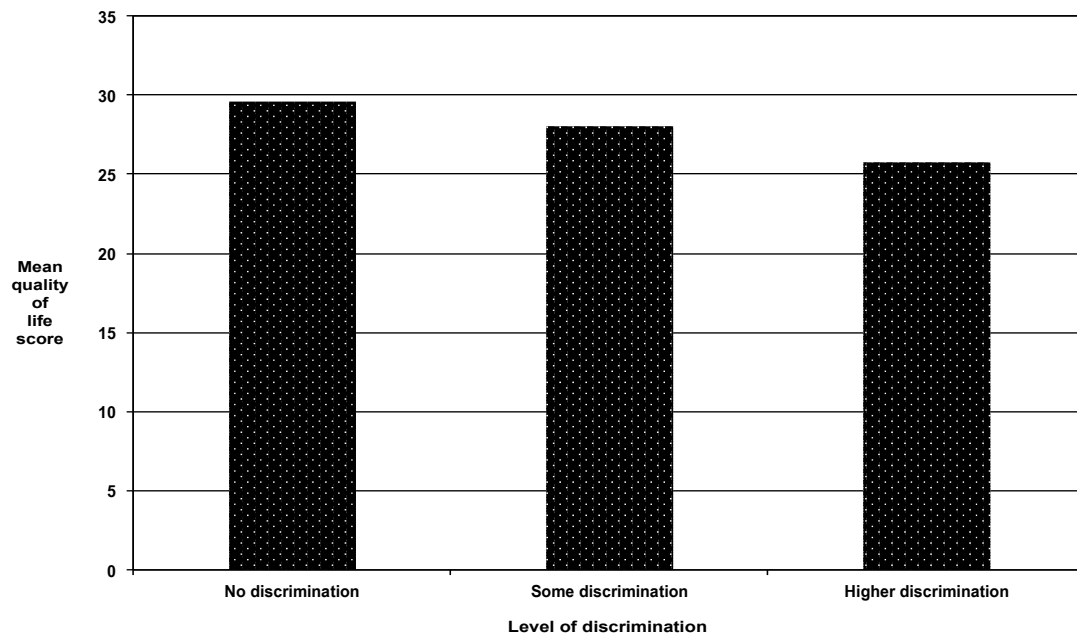
Figure 33. Quality of life according to level of discrimination.

Age, Retirement, and Gender

Although age was identified as the strongest foundation for discrimination, increasing age was associated with *decreasing* levels of perceived discrimination ($p<.001$). According to Figure 34, only 9.2% of the 70-90 year-olds reported relatively high levels of discrimination compared to 28.4% of those in the youngest age groups. With regard to retirement status, (Figure 35) those working full-time were more likely to report relatively high discrimination (24.9%) compared to those who had fully retired (15.9%). It is possible that older people and retirees report lower discrimination because they are exposed to fewer opportunities for discrimination. For instance, the work place is a known context in which age discrimination occurs (Roscigno, Mong, Byron, & Tester, 2007). In the NZLSA sample, 46% had completely retired and would therefore not be exposed to work place discrimination.
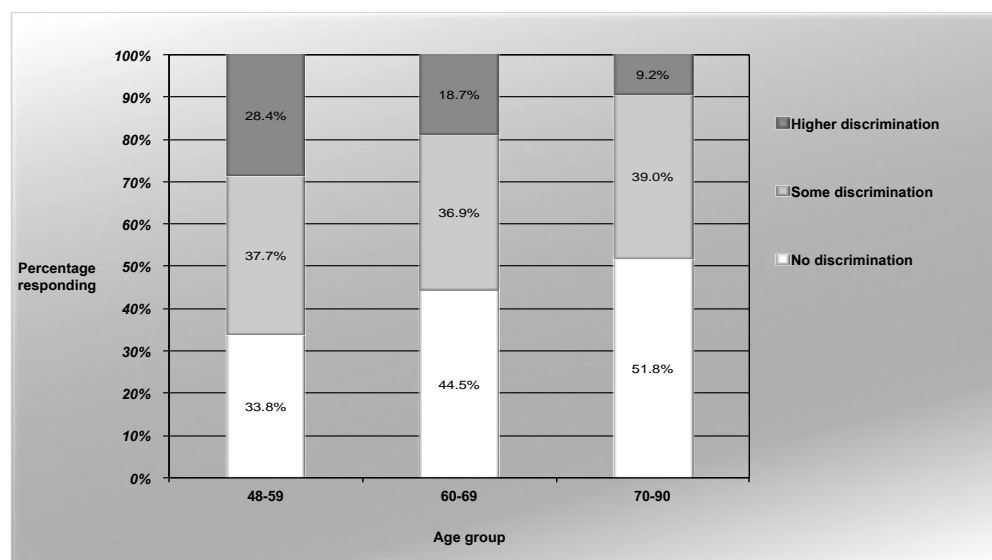
Figure 34. Level of discrimination according to age group.
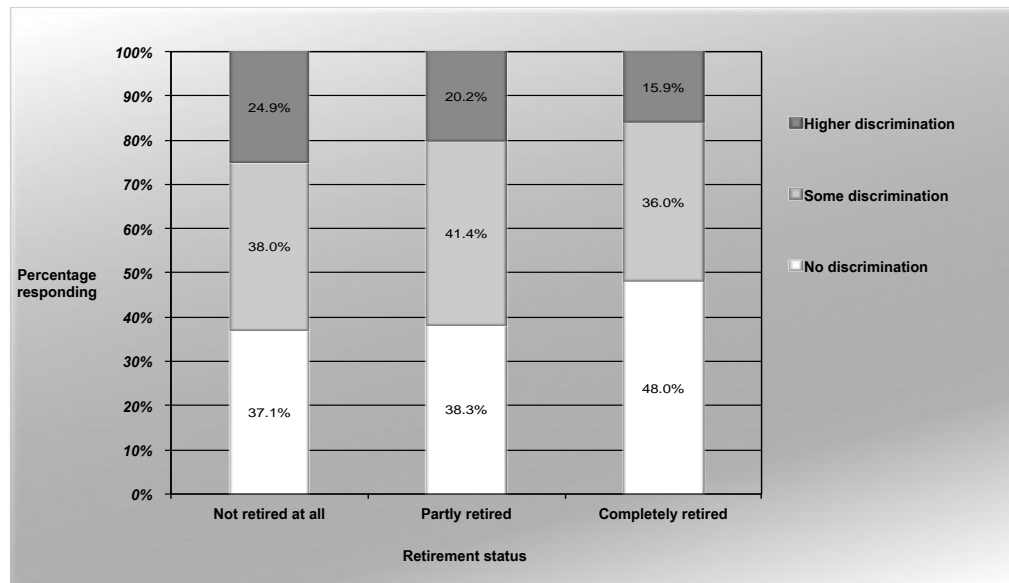
Figure 35. Level of discrimination according to retirement status.

NZLSA data showed that men and women reported similar levels of discrimination, but there were differences according to marital status (*p*<.001). Figure 36 shows that those reporting the highest levels of discrimination were in Civil Union or de Facto relationships (25.6%), those who were divorced or separated (25.5%), and people who had never married (31.9%). This compares to only 18.4% of married people reporting high discrimination and 13.1% of widowers. Those in Civil Unions, divorcees and those who have never married may face relatively high levels of discrimination for different reasons. For example, the stigmatism of divorce is still apparent in many cultures (Kung, Hung, & Chan, 2004), as are negative attitudes towards those who remain single (Zajicek & Koski, 2003). One explanation for higher rates of discrimination in the Civil Union/De facto group is that the group may comprise a disproportionate number of gay and lesbian couples. Thus reported levels of discrimination may be a function of the participants' sexuality rather than their marital status in this instance.
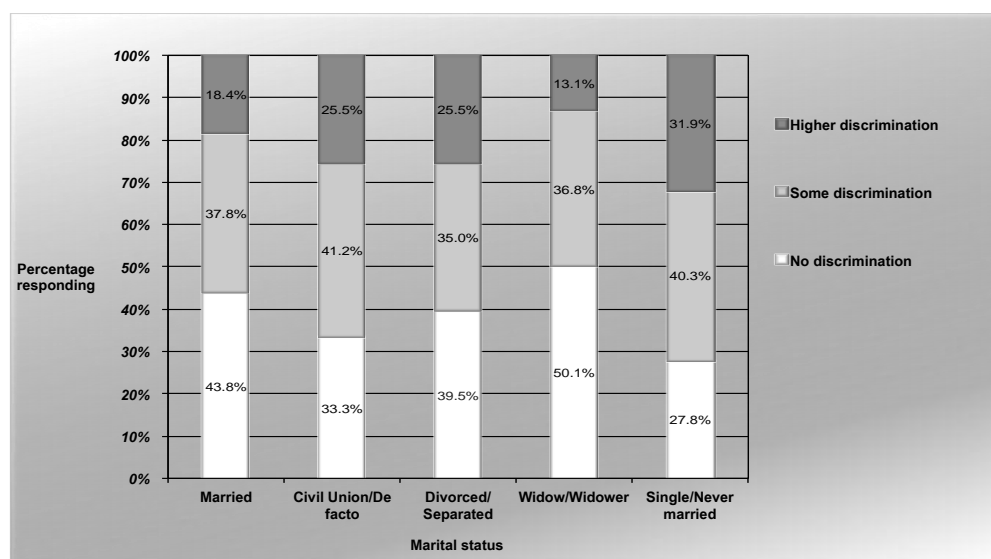
Figure 36. Level of discrimination compared to marital status.

Significant ethnic differences in experiences of discrimination were reported. This was not surprising given the importance the participants placed on ethnicity as a source of discrimination. Figure 37 shows that those identifying only as Māori were the most likely to report relatively high levels of discrimination (29.7%) followed by those identifying as both European and Māori (24.5%), and those identifying as European only (19.2%, $p<.001$). Approximately one quarter of the groups categorised as Other reported relatively high levels of discrimination, but the ethnic heterogeneity of this groups precludes further analysis.
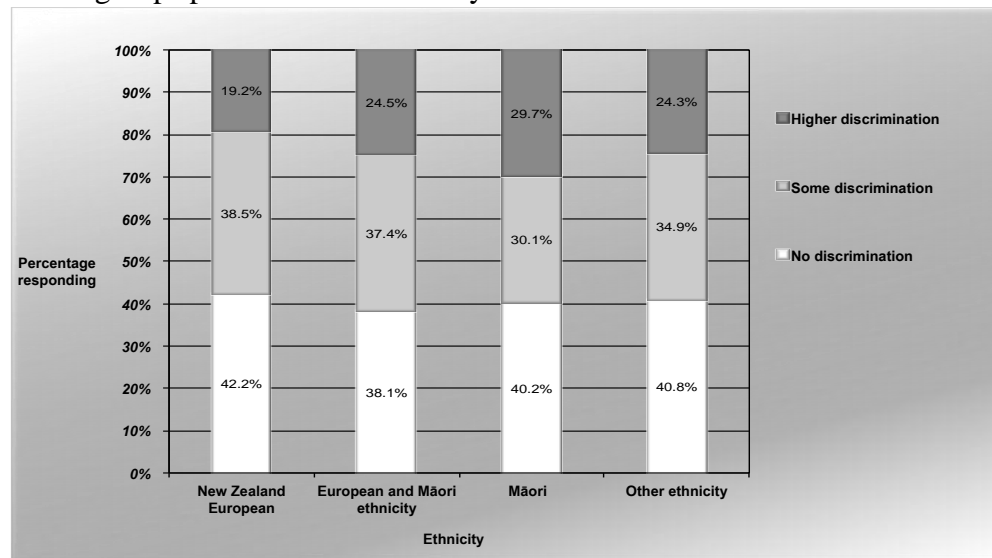
Figure 37. Level of discrimination according to ethnic background.

Socioeconomic Status

Exposure to high levels of discrimination was reported equally across income groups and educational qualifications. However, exposure to discrimination varied considerably according to the participants' economic living standards. According to Figure 36, those reporting the highest level of discrimination reported significantly ($p<.001$) poorer living standards than those reporting some or no exposure to discrimination. Those reporting some discrimination also reported poorer living standards than those reporting no discrimination.
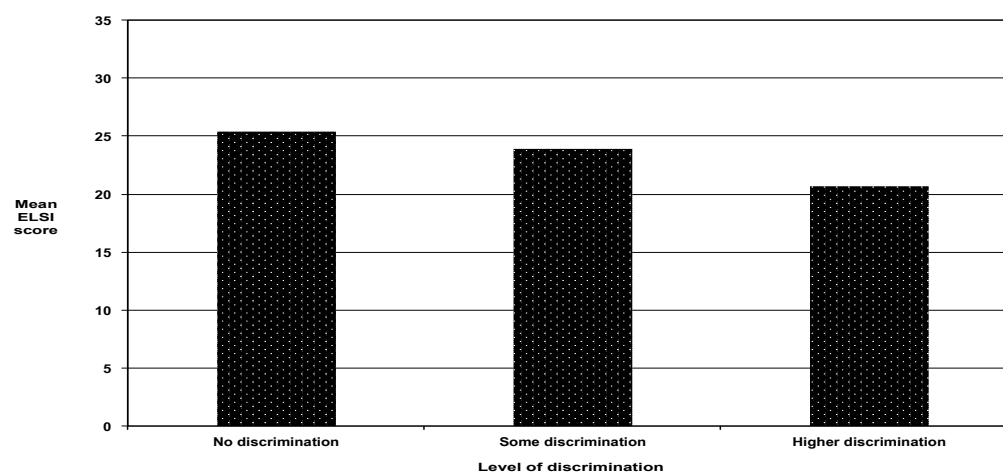
Figure 38. Level of discrimination according to living standards.

Summary and Concluding Comments

The majority of the NZLSA participants reported reasonably high levels of social support, but they did so from within a wide variety of social network types. Those in relatively extensive social networks (i.e. Wider Community-focused; Locally Integrated) were more likely to report better health and quality of life. In contrast, those in Private and Family Dependent networks (approximately 20% of the sample) were more likely to report poorer mental health, quality of life and amount of social support they could provide and receive. They were also significantly more likely to have felt lonely and discriminated against compared to those who had more extensive networks comprising friends, neighbours and their wider community. These findings reinforce international understandings of the importance of social support to health, and point to possible sites for intervention to improve opportunities for engagement in supportive social networks and reduce loneliness. Further results point to particular groups to whom such intervention may be targeted.

Age and retirement status were associated with the four elements of social integration (social networks, social support, loneliness and discrimination), but not always in the expected direction. Older adults and retirees were more likely to be engaged in the more extensive network types, while the younger workers tended to be classified as belonging to Private or Family Dependent networks. However, the level of perceived social support decreased slightly with age and the transition into retirement. Findings also showed that older adults and retirees were less lonely and reported less discrimination compared to the younger working group.

Social integration was not strongly associated with gender, but differences based on marital status and ethnicity did emerge. Those who had never married or had divorced were categorised as belonging to more restrictive social networks and reported less social support and higher levels of loneliness. Thus, having a partner from late-middle age onward may be an important contributor to social integration. Those identifying as Māori or Māori and European were more likely to be categorised as Locally Integrated compared to those only identifying as European. However, those identifying as Māori only reported less social support. While there were no ethnicity-based differences in loneliness, increasing levels of discrimination were associated with non-European ethnicities.

There were substantive differences in social integration that could be attributed do differing socioeconomic background—particularly economic living standards. Socioeconomic disadvantage was more evident in Family Dependent and Private social networks and was associated with lower levels of social support, feelings of loneliness and greater discrimination. These findings suggest that economic disadvantage is an important barrier to social integration and the resultant health benefits.

In summary, our analysis showed that those in Private and Family Dependent network types tend to be economically disadvantaged, single, working full-time and younger. This is a worrying finding as these network typologies are associated with lower levels of social support and poorer health outcomes in later life. Higher levels of loneliness and discrimination reported by the younger group may also compound

the effects of non-supportive networks on their health. However, those most at risk for poor health and well-being in later life are those with the fewest socioeconomic resources. For these groups, understanding the buffering effects of social integration is of vital importance for future research, particularly for younger groups transitioning out of the work force.

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Appendix 1. Means and (Standard Deviations)

	Social support		Physical health summary		Mental health summary		Quality of life	
Network categorisation	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Family Dependent	77.7	8.7	49.8	10.9	48.0	7.5	27.4	4.3
Locally Integrated	83.2	9.2	50.1	10.4	50.6	7.2	29.2	4.9
Local Self-contained	78.6	9.8	50.4	10.3	49.0	7.8	27.7	5.9
Wider Community-focused	81.1	9.1	50.2	10.4	50.5	6.5	29.0	5.0
Private	75.4	10.5	50.8	11.1	47.3	9.3	26.5	6.5
Loneliness								
Not lonely	84.8	7.9	51.0	10.3	51.7	6.4	30.2	4.5
Moderately lonely	77.4	8.6	49.6	10.7	48.4	7.3	27.3	5.0
Very lonely	66.5	8.4	46.8	12.2	41.8	9.6	21.6	6.0
Discrimination								
No discrimination	82.1	9.4	50.7	10.6	51.2	6.8	29.6	5.1
Some discrimination	80.1	9.7	50.2	10.6	49.2	7.5	28.0	5.1
Higher discrimination	75.7	10.4	48.5	11.2	45.8	8.7	25.7	6.0
Age								
48 – 59	80.6	10.6	53.1	9.2	48.2	7.8	28.1	5.7
60 – 69	80.2	9.7	49.9	10.7	49.9	7.7	28.5	5.2
70 – 90	78.8	9.3	45.6	11.5	50.3	7.4	27.7	5.7
Work Status								
Not retired	80.9	10.0	54.1	8.1	49.2	7.2	28.8	5.1
Partly retired	80.5	10.2	52.7	8.5	49.8	7.5	28.8	5.0
Fully retired	79.2	9.7	46.0	11.7	49.4	8.0	27.5	5.8
Gender								
Male	79.8	9.9	50.5	9.9	49.7	7.6	28.2	5.5
Female	80.3	9.9	49.7	11.4	49.2	7.7	28.2	5.5
Marital status								
Married	81.7	9.3	50.6	10.3	50.0	7.2	28.6	5.2
Civil Union/de Facto	80.2	9.6	52.2	8.6	47.7	8.6	27.8	6.0
Divorced/Separated	75.3	10.3	49.3	11.1	47.7	8.9	27.1	6.2
Widow/Widower	75.3	10.2	46.3	12.6	49.0	7.9	27.4	5.9
Single/Never married	73.1	11.0	47.2	12.5	46.7	8.6	26.3	5.9
Ethnicity								
European	80.3	9.9	50.3	10.8	49.6	7.6	28.3	5.6
Euro/Māori	79.7	9.6	48.5	11.2	48.8	7.5	27.9	5.3
Māori	78.0	9.9	48.3	9.8	46.1	8.7	28.0	5.4
Other	77.3	10.9	49.8	9.9	48.7	7.9	27.6	5.0
Income								
$0 – 25,000	78.4	10.5	47.5	11.2	47.6	8.7	27.0	6.1
$25k – 50,000	78.3	9.7	46.6	11.8	49.6	7.8	27.1	5.6
$50k – 75,000	80.5	9.5	51.3	9.9	49.5	7.9	28.5	5.3
$75k – 100,000	81.0	10.1	52.3	9.8	49.7	7.3	28.7	5.4
$100,000 +	82.7	9.3	54.2	8.0	50.3	6.6	30.1	4.4
Education								
No secondary qualification	77.3	10.1	46.3	11.2	48.8	8.6	27.1	6.0
Secondary qualification	79.8	10.5	50.1	10.8	49.3	8.0	27.9	5.6
Post-secondary/Trade qualification	80.0	9.4	50.2	10.4	49.2	7.5	28.2	5.4
Tertiary qualification	82.4	9.4	52.8	9.7	50.0	6.8	29.4	4.8