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# **Longing to belong: personal social capital and psychological distress in an Australian coastal region**

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**Improving the lives of Australians**

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# Executive summary

## Longing to belong

There is a pervasive and frequently expressed perception about a sense of loss of community in Australia, together with a fear of its consequences, and a longing to belong and to reconnect with community. Prominent social theorists and social commentators have echoed this sentiment, as have politicians at all levels of government and on both sides of Australian politics. These concerns are not limited to Australia, but are consistent with concerns, particularly about social exclusion, across the developed world. In addressing issues of disconnectedness and exclusion, it is essential to consider the roles played by (i) mental health problems in perpetuating exclusion and (ii) exclusion in generating or perpetuating mental health problems. It is also essential to note the multilevel impacts of disconnectedness and exclusion, which affect individuals, families and communities.

This study is a contribution to articulating and critically examining Australians' perceptions about their levels of community participation, their thoughts and feelings about this, the effects it appears to have on their sense of connectedness to their community, and what it might mean for their mental health.

## Purpose and aims of this study

The purpose of this research was to advance knowledge and understanding about the relationship between social capital and mental health and, thereby, to articulate insights that are amenable to inclusion in public policy debate. To achieve this goal we have described the relationship between breadth of community participation and perceptions about participation, investigated their shared relationship with general psychological distress, and examined the plausibility of the social capital hypothesis as an explanation for why participation is associated with distress. The research question for this project was:

Within a disadvantaged rural Australian population, how frequently do people participate in different domains of community activities, to what extent do they consider their participation adequate and enjoyable, and how are these factors related to their levels of personal social cohesion and their mental health?

The present study has addressed five specific aims. These were to evaluate the:

- extent to which people consider their levels of community participation to be adequate
- extent to which people enjoy participating in different types of community activity
- relationship between levels of community participation, and sense of adequacy and enjoyment of participation
- relationship between levels, adequacy and enjoyment of participation, and personal social cohesion (sense of belonging, trust, reciprocity and optimism)
- relationship between levels, adequacy and enjoyment of participation, personal social cohesion and mental health.

## Theoretical background: the social environment and mental health

There is extensive evidence that economic and social participation are essential to the wellbeing and success of individuals, their families and their communities. People who are embedded in economically and socially active communities tend to experience better health and wellbeing than those who are not. The importance of mental health (and the costs of poor mental health) has also come to prominence as a key issue that influences and is influenced by the wellbeing of communities. With this in mind, the resilience or vulnerability of communities, and the extent to which they can connect the individuals living in them, can have substantial fiscal and political implications. This focus was underscored with the publication of the Council of Australian

Governments' National Action Plan on Mental Health 2006–2011. In designing policy that might help strengthen communities and optimise outcomes for their residents, the concept of social capital has become an important theoretical driver.

### *Social capital and mental health*

Social capital theory offers one way of conceptualising the social environment and linking it to mental health. Broadly, social capital is made up of two connected components, participation and social cohesion, which are by implication causally connected. They are respectively known as the structural and cognitive components of social capital (Almedom 2005; Mitchell & Bossert 2007; Whitley & McKenzie 2005), or 'what people do' and 'what people feel' (Harpham, Grant & Thomas 2002). Through an in-depth investigation of the nature of community participation, the present study clarifies aspects of the structural component of social capital. **Social cohesion**, that results from participating in the community, refers to how effective community networks are in connecting people and engendering cooperation and collective action (Saunders & Winter 1999).

There are a number of important challenges in social capital research, including:

- the notion that social capital is (always) a public good and therefore governments should be concerned about declining levels of social capital and take urgent restorative action (for a critique, see Edwards & Foley 2001; Foley & Edwards 1999)
- considerable problems for research and policy to do with social capital's 'acute definitional fuzziness' (Edwards & Foley 1998), especially with respect to conceptualisation and measurement
- confusion about cause and effect (Heying 1997)
- confusion about at which levels of analysis the concept of social capital should be applied—individual and/or collective (Almedom 2005; De Silva et al. 2005; McKenzie 2003; McKenzie, Whitley & Weich 2002; Whitley & McKenzie 2005)
- confounding of the concept of social capital with related concepts, such as neighbourhood cohesion (Drukker et al. 2005; Kavanagh, Turrell & Subramanian 2006; Ziersch et al. 2005)
- overuse of the concept (Macinko & Starfield 2001).

Despite these challenges, a body of evidence is emerging that recognises the possible symbiosis between social capital and mental health—that they might be reciprocally causally connected, and that this connection is important. The proposition that the social environment influences mental health is not new (Whitley & McKenzie 2005) and nor is the idea of social capital (Farr 2004; Hanifan 1916 cited in Putnam 2000), but the two ideas come from different disciplines and have not been integrated. The present study draws attention to and reviews this lack of integration of disciplinary pathways, contributing to addressing some of the integration challenges.

### *Conceptual model*

There are three main perspectives on how the social environment may be linked (or not) to mental health, and they are not mutually exclusive. These are that:

- mental health is a product of the social environment
- mental health shapes individuals' social environment
- people's mental health is a product of and a force for shaping their social environment.

This study focuses on the first of these through the vehicle of social capital, exploring social capital and its relationship to mental health.



The research question and aims for this study are located within a framework developed from social capital theory. This theory suggests that social capital is a mediator of the relationship between upstream factors in the macro social environment and mental health outcomes. We focus on the individual level of analysis (personal social capital), proposing that participating in the community enhances levels of social cohesion, which, in turn, protectively influence levels of psychological distress.

### **The Eurobodalla Study: design and methods**

Addressing two of the major criticisms of social capital research, we have conducted purpose-designed research with valid and reliable measures of constructs. The *Eurobodalla Study*, on which this research was based, was purpose-designed to test a specific operationalisation and measurement strategy. One of the achievements of the study has been to enable a detailed clarification of the concept of community participation and its measurement (Berry, Rodgers & Dear 2007), and trust (Berry & Rickwood 2000; Berry & Rodgers 2003) on which the present study builds.

#### *The Eurobodalla Shire*

The Eurobodalla Shire covers over 3,000km<sup>2</sup> of the New South Wales south coast, with nearly 80 per cent national park or state forest. It had a population of around 38,000 in 2001 when data were collected, heavily weighted towards the older age groups, perhaps because it is a retirement destination. In 2001, around 1,400 people identified as Indigenous Australians, 4.2 per cent of the shire's population and about double the national average. The shire has high rates of socioeconomic disadvantage. Rates of unemployment (17 per cent in March 2000) and underemployment are high due to seasonal and casual holiday work; a large proportion of people (27 per cent in 1996) rely on income support; median income was about 70 per cent of the state average; and, in 2001, only about one-quarter had completed educational qualifications beyond Year 12.

#### *Participants*

Participants were 963 residents of the Eurobodalla Shire aged 19 to 97 years ( $M=52.78$ ,  $SD=18.24$ ), randomly drawn from the electoral roll for the federal seat of Eden-Monaro. A stratified sampling procedure was employed to recruit equal numbers of women and men to the study, and to ensure adequate representation in each of three generations (Berry & Rodgers 2003). Participants voluntarily completed an anonymous self-report questionnaire.

#### *Measures*

In addition to sociodemographic factors, breadth of community participation, perceptions about community participation (thoughts and feelings), personal sense of social cohesion and psychological distress were measured for this study.

#### *Community participation*

Breadth of participation was measured using an index based on the Australian Community Participation Questionnaire (ACPQ) which measures frequency of 14 types of participation (Berry 2008, Appendix C). Measures of subjective perceptions about community participation were developed for this study and include thoughts (whether respondents thought they participated too much or too little) and feelings (enjoying or not enjoying participating).

#### *Personal social cohesion*

Personal social cohesion was defined in this study as a combination of respondents' universalistic (harmony) values, subjective perceptions about sense of belonging, levels of generalised reciprocity and social trust, and hope for the future (optimism). It was measured by combining the following instruments in a one-factor congeneric model:

- **Values** were measured using the **universalism** domain of Schwarz's 10 universal values.
- **Sense of belonging** was measured using the 10-item belonging subscale of the Interpersonal Support Evaluation List (Cohen et al. 1985).
- **Generalised reciprocity** was measured using the one-item measure from the World Values Survey (WVS) (Inglehart et al. 1997).
- **Social trust** was measured using a weighted composite derived from a one-factor congeneric model based on (i) a short-form of the Organizational Trust Inventory (OTI) (Cummins & Bromiley 1996) as adapted for use in the general population (Berry & Rickwood 2000; Berry & Rodgers 2003) and (ii) the one-item measure of trust from the World Values Survey (Inglehart et al. 1997).
- **Optimism** was measured in the present study using the Scheier, Carver & Bridges (1994) 10-item questionnaire.

### *General psychological distress*

General psychological distress ('distress') is a general indicator of the presence of mental health problems. We measured distress using the Kessler 10-item scale (K10) which measures symptoms of non-specific psychological distress (Andrews & Slade 2001). This is a widely used measure of general psychological distress that has been extensively used in Australian studies.

### *Analytic techniques*

In addition to the use of descriptive statistics, the major analytic techniques used in this study were:

- zero-order and partial correlations
- analysis of variance
- multiple hierarchical regression modelling (including mediation analysis)
- one-factor congeneric modelling
- structural equations modelling.

## **Personal social capital and mental health: summary of study findings**

The 'Big 7'—seven types of community participation including taking an active interest in current affairs, socialising with household members, friends, extended family and neighbours, taking part in organised community activities and religious observance (Berry, Rodgers & Dear 2007)—have been independently linked to better mental health. Using data from the *Eurobodalla Study*, we investigated whether respondents considered their levels of participation to represent too little or too much time spent engaging in these seven types of participation and whether or not they enjoyed their participation.

### *Do people think they participate enough?*

The large majority of respondents reported that they considered their levels of participation to be to some degree inadequate. In contrast, only around one-in-five respondents reported spending too much time engaging in one or more of the seven types of participation that are associated with better mental health. Perceptions about engaging too little or too much were not related: people could perceive themselves as simultaneously spending too little time in some types of participation and too much in others.

### *Do people enjoy participating in the community?*

The very large majority of respondents particularly enjoyed at least some types of community participation. There was no type of participation that was the most commonly considered enjoyable. Not enjoying

participating was rare. Nearly 90 per cent of respondents reported that there were no types of participation that they found particularly unenjoyable. Religious observance stood out as the type of participation least likely to be nominated as particularly enjoyable and the most commonly endorsed as unenjoyable. People who reported that they particularly enjoyed some types of participation were slightly less likely than other respondents to report that they particularly did **not** enjoy some types of participation.

#### *Is breadth of participation linked to people's perceptions about it?*

Those who reported greater breadth of participation were somewhat more likely than their peers to also report enjoying participating. With the exception of this one association, all other perceptions about participating were weakly related, or were not related, to breadth of participation. Breadth of participation thus appears to be a different concept from perceptions about the adequacy and enjoyableness of participation, with the latter two constructs adding to knowledge about community participation.

#### *Is community participation linked to social cohesion?*

Consistent with the hypotheses, higher levels of participation and favourable perceptions about participation were strongly related to higher levels of cohesion. The modelling found strong support for a pathway from participation to cohesion. Simultaneous testing of the reverse pathway delivered a non-significant regression estimate for the latter, supporting the proposition that participating in the social and civic life of the community increases levels of social cohesion.

#### *Is personal social capital related to mental health?*

Our findings were robustly consistent with the social capital explanation for the link between community participation and psychological distress, and not supportive of the other hypotheses that we tested. Personal social capital has been defined as a form of social capital that is a property of the inherent personal characteristics and behaviours of individuals. We expected that community participation would not be directly predictive of distress but would have a mediated relationship with distress via personal social cohesion. We found robust support for this hypothesis. We also found strong support for our expectation that breadth of participation and perceptions about participation would, in combination, be related to personal social cohesion and that personal social cohesion would be negatively associated with general psychological distress. We found higher levels of cohesion to be extremely strongly related to lower levels of distress.

### **Theoretical implications of the study**

Social capital research has been fraught with theoretical and methodological difficulties. Achieving advances in methodology, including in concept definition, terminology, operationalisation and measurement, are essential to achieving greater theoretical clarity (Whitley & McKenzie 2005). Using appropriate and sophisticated modelling techniques is also essential. By addressing some of these requirements, this study has clarified and extended the description of the nature of community participation, the nature of social trust, the nature of social cohesion and the relationships among these factors separately and in relation to distress. The study has also demonstrated the theoretical and statistical coherence of the concept of personal social capital, provided an example of how it might be modelled, and shown how it is related to distress.

The plausibility of the personal social capital explanation for the relationship between community participation and mental health has been clearly demonstrated. Criticisms of the potential for social capital theory to contribute positively to advances in mental health research may be discarded, as may be the hypothesis that the link between participation and mental health is spurious. Social capital appears to offer a 'promising heuristic' for psychiatric epidemiology (Whitley & McKenzie 2005).

### **Limitations of the study**

The present study has not engaged with aspects of social capital theory that relate to distinctions between bonding, bridging and linking social capital. There also remain outstanding questions about causal

relationships among components of the model and especially pathways to mental health outcomes. While cross-sectional data are not appropriate for addressing these questions, they have been appropriately and successfully used for:

- identifying and describing relevant factors
- investigating the epidemiology of associations among these factors
- commenting on the plausibility of specific hypotheses.

Due to the collection of extensive data on community participation in the *Eurobodalla Study*, there was limited opportunity to collect detailed data on sociodemographic characteristics and disadvantage. As there is considerable evidence linking deficits in social capital to disadvantage, future studies would need to examine the relationships between breadth of and perceptions about participation, components of cohesion and aspects of disadvantage. The forward research program described below will offer opportunities to address the limitations of this study.

### **Forward research program**

A new program of research into social capital being undertaken in 2007–09 includes five studies designed to expand on the present research using data from the Household, Income and Labour Dynamics in Australia (HILDA) survey. They are:

- Conceptualising and measuring social capital in the HILDA survey.
- Social capital and mental health in Australia: a multilevel analysis.
- Social capital, drought and mental health: can connectedness to community really ease the pain?
- Community participation, managing transitions out of paid work, and mental health.
- The urban environment and health: physical incivilities and substandard housing.

Each is a stand-alone study. The scientific objective of the program as a whole is to create a substantial, coherent body of new policy-relevant knowledge and information about Australian communities and mental health. Research in this area is urgently needed and has to date been insufficient.

### **Implications for policy and practice**

The program of new research described above has been designed to be directly applicable to FaHCSIA's overall vision of individual Australians thriving within a context of households that are thriving within communities that are themselves thriving. Separately and together, the studies are directly relevant to specific strategic themes and/or parts of the department. They build on previous work undertaken with the Department by Berry and colleagues (see, for example, Berry (2008); Berry et al. (2007); Berry & Rickwood (2000); Berry & Rodgers (2003); Berry, Rodgers & Dear (2007)), including the present study. In addressing certain major theoretical and methodological issues in research into social capital and mental health, the present study has shown that advances in the understanding of the concept can be achieved and that these can be interpreted in terms of their implications for policy and practice.

### ***Not just any type of participation will do***

Because of its associations with increased social cohesion, encouraging participation in the community could be a safe and effective mental health promotion strategy. It is an appealing policy lever: it is relatively conceptually and practically straightforward, cheap, easy, quick, low risk (if appropriate types of participation are encouraged) and highly amenable to intervention. But not any type of participation will deliver policy goals, and some risk doing quite the opposite. Further, rather than encouraging very extensive involvement in just one or two types of participation, breadth of participation across as many of the Big 7 types as possible

would be more effective in achieving mental health and community benefits. It must be reiterated, however, that the focus must remain on personal agency and choice within an environment in which broad participation is facilitated and encouraged, without compliance demands.

### *Fun as a policy lever*

Even when appropriately targeted and delivered, encouraging breadth of participation across particular types is not sufficient alone. To derive mental health benefits from increasing levels and breadth of community participation, it is essential for participation to be perceived as enjoyable and sufficient. This is consistent with the proposition in another Australian study that people will not engage in social network activities that do not meet their needs (Phongsavan et al. 2006). It would be counterproductive to encourage people to engage in types or levels of community participation that they perceive to be unenjoyable or excessively demanding of their time.

### *Tailoring social capital interventions*

Women and men (and, quite possibly, other groups) need different policy instruments to extract mental health benefits from enhancing levels of community participation. Most people would benefit from higher levels of participation overall, from greater breadth of participation, and from enjoying their participation. But this study has shown that pressure on people to do too much, or on men to do things they do not enjoy, could be counterproductive for mental health. In addition, social capital might have a harmful effect on mental health for some groups (Almedom 2005), perhaps resulting from what are sometimes perceived as restrictive social norms (Whitley & McKenzie 2005) or burdensome obligations.

## **Conclusion**

This study has related different aspects of community participation to personal social cohesion and modelled pathways among concepts. Findings indicate that the personal social capital hypothesis is a plausible and potentially powerful explanation for the link between community participation and mental health. Participating in the social and civic life of the community is important for mental health, primarily because of the increase in personal social cohesion with which it is associated. Previous research has found that only some types of participation are related to mental health, and that the strength and direction of association differs among those that are related. This study has confirmed the importance of breadth of community participation across specific types, and has also found that perceptions of participating too little are also important (negatively) for mental health. We have found that the most important aspect of community participation is enjoying participating.

It is essential in developing policy with respect to social capital and mental health to ensure the decision-making process builds on sound evidence (De Silva et al. 2005) in which concepts have been systematically defined and appropriately measured (Whitley & McKenzie 2005).

The findings of the present study will assist in the design of inexpensive, safe and effective social capital interventions, focused on broadly-based and enjoyable community participation. They will also help inform the design of future studies of social capital and mental health.



# 1 Introduction

## Section summary

This section introduces the present study, beginning with an overview of why the study has been conducted. A structured literature review is presented summarising research into the relationship between the social environment and mental health and into social capital and health. Substantive and methodological challenges in social capital research and its relationship to mental health are discussed, together with a commentary on how different fields of research might assist in resolving these challenges. The section ends with the presentation of a conceptual model for the present study and associated research aims and hypotheses. The intended outcomes and outputs from the study, and the way in which the report has been structured, are described.

## 1.1 Longing to belong

There is a pervasive and frequently expressed perception about a sense of loss of community in Australia, together with a fear of its consequences, and a longing to belong and to reconnect with community. Prominent social theorists, such as Eva Cox, have articulated Australians' desire to feel connected to their communities. In her 1995 Boyer Lectures on a *Truly civil society*, Cox spoke of Australians' valuing of connectedness and of their disillusionment as national leaders failed to respond to the sense of loss of community. Social commentators such as Hugh McKay have echoed this sentiment. Speaking of the reasons for a growing number of Australians seeking radical lifestyle change, McKay said:<sup>1</sup>

The third [reason for] change is coming from people who are looking for a new framework for making sense of life in an uncertain world. Young Australians are driving this trend, but older people are quickly catching on.

For some, the new framework is spiritual. For others, it is based on the desire to reconnect with 'the herd', so that individuals obtain a stronger sense of identity and of emotional security from re-creating communal connections that simulate the 'village life' to which so many Australians aspire.

More recently in an article in the *The West Australian*, McKay wrote of two themes [that] consistently emerge when Australians talk about what's on their minds, one of which is that we are losing our sense of being part of a community, a neighbourhood (28 April 2007). Other commentators have aired similar concerns. In an article for *The Australian* entitled 'Wealthier, but poorer for all that', Richard Eckersley wrote of the breakdown in community life as the price paid for growing national prosperity (23 March 2001, p. 13).

Politicians on both sides of Australian politics have echoed the same themes. In a speech to the Communities in Control conference in 2003, Minister for Family and Community Services, Senator Amanda Vanstone, said 'people have been talking about loss of community ever since I've been even vaguely interested in the topic of community'. In a Labor Party 2007 policy platform, *New directions for Australian children* (Rudd, Roxon & Macklin 2007), concern is expressed about evidence that one-third of all communities [in Victoria] suffer from 'low social cohesion'—where inadequate levels of community reciprocity, trust and resources make it more difficult for individuals and families to overcome the individual and family problems that lead to poverty (p. 11).

Around the world, numerous organisations have been created whose aims are to help rebuild community. Prominent among these is the Saguaro Seminar in America, whose aim is to advise on how to 'build bonds of civic trust among Americans and their communities' (Putnam 1995–2000). In Australia, organisations have sprung up with similar aims. For example, communitybuilders.nsw,<sup>2</sup> supported by the Premier of New South Wales, aims to help local communities across the state share ideas on how to enhance and strengthen their community. The website provides extensive links and sources of information, including publishing papers and speeches that seek to analyse the loss of community that Australians express. In one such paper,



Heather Nesbitt (December 2000), representing the Planning Institute of Australia, tried to capture the reach of this sense of loss of community among diverse parts of Australian society:

The term community is thrown around wildly these days as politicians, residents, businesses and professionals struggle to try to retain what some see as a lost component of our modern lifestyles. How often have I heard that our 'sense of community' is dying and that people no longer feel that they are part of a 'community'.

This same concern is not confined to Australian commentators and academics, as is evident in a recent article in the *The Guardian*, in which Annie Kelly referred to people's fear of losing our sense of community as a common thread linking widespread concerns among British citizens about Britain becoming 'an urbanised, work-obsessed nation of out-of-town supermarket shoppers' (16 August 2006). Concerns about growing evidence of a pervasive sense of loss of community, and about what this might mean for citizen wellbeing, are similarly found in academic journals around the world (for a recent review and empirical investigation of increasing social isolation in America, see McPherson, Smith-Lovin & Brashears 2006).

The study described in this report is a contribution to articulating and critically examining Australians' perceptions about their levels of community participation, their thoughts and feelings about this, the effects it appears to have on their sense of connectedness to their community, and what it might mean for their mental health.

## 1.2 Background to the study

There is extensive evidence that economic and social participation are essential to the wellbeing and success of individuals, their families and their communities. People who are embedded in economically and socially active communities tend to experience better health and wellbeing outcomes than those who are not. With this in mind, the resilience or vulnerability of communities, and the extent to which they can connect the individuals living in them, can have substantial fiscal and political implications. In designing policy that might help strengthen communities and optimise outcomes for their residents, the concept of social capital has become an important theoretical driver. The importance of mental health—and the costs to society and individuals of poor mental health—have also come to prominence as a key issue that influences and is influenced by the wellbeing of communities. In recognition of the possible symbiosis between the two concepts—that social capital and mental health might be reciprocally causally connected—a body of research is emerging that focuses on the extent to which these concepts might be related, how any associations might operate, and what might be the policy implications of such links.

The purpose of the present study is to contribute to the emerging body of research into social capital and mental health by further clarifying the nature of and relationships among key concepts. In terms of policy value, two important theoretical features of the study are to:

- add to recent Australian developments in knowledge about the largely unexamined concept of community participation, a core component of social capital
- examine the plausibility of the social capital hypothesis as a possible explanation for the link between community participation and mental health.

## 1.3 The social environment and mental health

As the following pages will show, the proposition that the social environment influences mental health is not new (Whitley & McKenzie 2005).

The relationship between the social environment and the onset and course of mental health problems<sup>3</sup> was investigated in early studies in social psychiatry. These early studies explored longitudinally the relationship between individual psychiatric morbidity and the social, economic and historical context. The field of social



psychiatry later shifted to focus more narrowly on social support (sometimes confused with social capital—Whitley & McKenzie 2005), but has begun to broaden again through the emergence of the concept of social capital as a predictor of mental health outcomes.

Social capital is also not a new idea. The term has appeared in its modern sense since at least early in the last century (Farr 2004). Describing the importance of large amounts of ‘social intercourse’ as one way of supporting the successful education of children in West Virginia, America, Hanifan (1916, cited in Putnam 2000, p. 19) wrote that:

The community will benefit from the cooperation of all its parts and the individual will find in [his] associations help ... [and] sympathy ...

Nearly 80 years later, in the book *Making democracy work*, Putnam, Leonardi and Nanetti wrote of social capital as ‘features of social organization, such as networks, norms, and trust, that facilitate coordination and cooperation for mutual benefit’ (1993, p. 1).

Though the concept of social capital is not new, and neither is the idea that the social environment more generally influences mental health, research into the relationship between social capital and mental health has not yet been connected to its roots in early social psychiatry. The early research is highly consistent with notions of social capital, but the marriage of social capital to mental health has not been easy, partly because the two concepts have been developed in different disciplinary fields. On the one hand, the development of social capital theory has largely taken place in the social sciences (in political science and, primarily, in sociology), and has tended to address issues of social capital generally, rather than focusing on social capital specifically with respect to (mental) health. Empirical testing has been constrained by a lack of biostatistical expertise.

Methodological advances for the investigation of mental health and for the development of psychiatric concepts and measures have, on the other hand, been primarily undertaken in psychology, epidemiology and biostatistics. Not only have they resulted in a confusing array of opinions and advice, little research has attempted to bring the two together by applying scientific method, including methods of design, conceptualisation, measurement and quantitative analysis, to the development of social capital theory (Whitley & McKenzie 2005). One goal of the present study is to draw attention to the connection between these fields of research and to apply what can be learned from one to what needs to be addressed in the other. Following is a targeted review indicating some issues that emerge in bringing these fields closer together.

## **1.4 Explaining the link between the social environment and mental health**

A brief review of evidence pertaining to how the social environment is linked (or not) to mental health is presented first. There are three main perspectives, that:

- mental health is a product of the social environment
- mental health shapes individuals’ social environments
- people’s mental health is a product of and a force for shaping their social environment.

These perspectives, which are not mutually exclusive, are briefly reviewed drawing upon a wide range of literature with particular reference to the early studies in psychiatric epidemiology that first linked the social environment to mental health. While individual studies have linked the social environment specifically to most mental health problems (Whitley & McKenzie 2005), we do not focus on any disorder in particular here, but are interested in the overarching explanatory propositions.

*Mental health is a product of the social environment*

This perspective proposes that the social environment affects mental health. These effects are not usually direct, but mediated and moderated by a wide range of community-level and personal characteristics. The same social environment does not affect all people equally, and different people experience the same social environment differently. Two early sets of studies illustrating this perspective are presented in Appendix A to illustrate the range of factors within the social environment that can affect mental health, and the complexity of the causal pathways linking the factors to mental health outcomes. These are the early studies in psychiatric epidemiology, mentioned above, that first linked the social environment to mental health.

*Individuals' mental health shapes their social environment*

A complementary perspective is that the social environment is not a neutral external factor that affects all people in the same way, and to the same degree, but that people influence their own environment. For example, personality may influence the individual's social environment (for a review of personality factors, see Berry et al. 2007). People with high levels of emotional instability have been found to attract negative life events. In a general population study of 892 Australians, people who reported symptoms of emotional instability were involved in more negative interpersonal interactions than more emotionally stable participants (Poulton & Andrews 1992). The authors concluded that emotionally unstable people could not be considered merely 'passive reactors' to whom events happened, but were 'highly emotionally sensitive and overly responsive' people who inadvertently attracted interpersonal difficulties.

Not only is it possible for personality to affect mental health in the context of particular social interactions, it can influence mental health over the entire life course.

Evidence from a British longitudinal study, the National Survey of Health and Development, revealed that adolescent personality made a contribution to predicting adult mental health experiences (Rodgers 1996). Similarly, childhood adversity has significantly predicted chronicity in adult mental health problems in clinical and in general population samples of Australians (Brown et al. 1994) and in international samples (Rutter & Smith 1995).

Personality may also influence more general factors within an individual's social environment, such as levels of social support. For example, depending on their personality, different people have different types and levels of social support (Emmons 1992), including across cultures (Tong et al. 2004). As with their influence on specific interactions, personality impacts on life events generally have also been found to have substantial effects over the life course. In a 20-year follow-up of London children who were 10 years old in 1970, childhood behaviour problems predicted severely difficult life events in early adulthood, irrespective of factors such as adult behaviour, mental health, or continuing contact with family of origin (Champion, Goodall & Rutter 1995).

*People are products of, and shape, their environment*

With strong evidence to support the propositions that people are products of their social environment, and that they also shape it, it is reasonable to conclude that the relationship between the social environment and individual outcomes must be reciprocal. That is, people influence, and are influenced by, their social environment. A small number of studies have directly investigated and produced support for this proposition. Early life experiences have been shown to influence the development of certain attitudes and behaviour that, in turn, have been shown to affect people throughout their lives. Positive childhood relationships with parents, for example, have been associated with higher levels of adult social support (Sarason & Sarason 1982).

## 1.5 Social capital: a targeted review

Social capital is one way of conceptualising the social environment. Three sociologists have been prominent in theory development in social capital: Bourdieu, Coleman and Putnam. Each has a different conceptualisation

of the components, functioning and role of social capital. The present study emphasises the work of the most recent of the three, Robert Putnam, because:

- Putnam's conceptualisation dominates current debate (Farr 2004), particularly with respect to health research (Moore et al. 2006)
- it is already extensively and almost exclusively used in epidemiology
- this study is not primarily about social capital, but is a development of its use in psychiatric epidemiology to assist in the framing of safe and effective social policy instruments.

A discussion of alternative definitions of social capital and their origins is given in Macinko and Starfield 2001.

Certain caution must be applied to the emphasis given to Putnam's work in modern epidemiology and in the present study. While his work is scholarly and informative, it contains certain weaknesses that have not yet been addressed with respect to its use in psychiatric epidemiology. There is not yet agreement about exactly what social capital is, or about which concepts are included in and excluded from its definition. Causal relationships between social capital and individual social and health circumstances have not been identified and, very importantly, concepts have not been scientifically operationalised and measured. This last issue is partly the result of the 'opportunistic' (Edwards & Foley 1998) use of existing databases to conduct Putnam-style analyses. These weaknesses are discussed further below and directly addressed in the analyses reported in the following sections.

### **Core components of social capital**

Broadly, social capital is made up of two separate and closely connected core components: participation and social cohesion (Putnam 2000), also respectively known as the structural and cognitive components of social capital (Almedom 2005; Mitchell & Bossert 2007; Whitley & McKenzie 2005), or 'what people do' and 'what people feel' (Harpham, Grant & Thomas 2002).

The structural component has to do with **participating in the community**, the networks of association that participating generates and the quality of relationships (Whitley & McKenzie 2005) within and between those networks. Through an in-depth investigation of the nature of community participation, the present study further clarifies aspects of this core component of social capital.

The cognitive component of social capital is the **social cohesion** that results from participating in the community. In terms of social capital, social cohesion refers to how effective community networks are in bringing people together and engendering cooperation and collective action for the good of the community as a whole (Saunders & Winter 1999). Social cohesion is evident in community-level characteristics such as ambient levels of social trust (trust in strangers), generalised reciprocity (the 'kindness of strangers'), cooperation, organisation, and information sharing (Portes 1998). Cohesion also includes characteristics such as loyalty, conceptualised as the 'glue' that binds members of cohesive groups to one another (Van Vugt & Hart 2004) and other prosocial norms and values (Portes 1998).

Social capital can also be considered in terms of its purpose and the level at which connections are made within and between communities, with particular reference to power relationships (for a recent commentary, see Whitley & McKenzie 2005). These are typically referred to as bonding, bridging and linking social capital. These concepts have been extensively discussed elsewhere (for example, Almedom 2005; Blakely & Ivory 2006; Ferlander 2007; Harpham, Grant & Thomas 2002; Mitchell & Bossert 2007; Szreter & Woolcock 2004; Woodhouse 2006) and are not reviewed here because they are outside the scope of the present study.

For the most part, research into social capital and health is based on the structural/cognitive approach (Yip et al. 2007), though it should be noted that social capital is complex, and each level of social capital may have structural and cognitive components (Almedom 2005).

### **Social capital as a public good**

Research interest in social capital has been extensive and it is now reasonable to conclude that, generally speaking, communities rich in social capital enjoy both day-to-day and long-term health and social benefits. Social capital is considered to be of such importance to community wellbeing that the term is sometimes used as a synonym for community health. Healthy communities have been defined as those that have high levels of social capital, often operationalised as civic engagement and trust (Kawachi, Kawachi & Brainerd 1998). Further, Gilbert (1993) describes healthy communities as those featuring dense networks, cooperation and trust, and as typically being organic, reinventing, and self-regulating. Unhealthy communities, on the other hand, have poor infrastructure and capacity building, high levels of crime, especially violent crime, and poor physical health (Hancock & Duhl 1988).

The view of social capital as a public good derives from the proposition that social capital is a property of the community as a whole (McKenzie, Whitley & Weich 2002), and is a shared resource that community members can draw upon freely to solve individual or collective action problems that they otherwise could not solve (Lochner, Kawachi & Kennedy 1999). Thus, generally speaking, communities that are rich in social capital are vital and organic, constantly renewing their ability to respond to group goals and to the needs of individuals (Gilbert 1993).

### **Levels of social capital are declining**

With many benefits, including mental health benefits, flowing from social capital to whole communities and to individual residents, it would seem desirable to ensure that stocks of social capital are built up and maintained at high levels. Of concern to researchers and policy developers (for an example that is regarded worldwide as a model, see Putnam 1995–2000), therefore, is evidence of a substantial overall decline in levels of social capital (Rahn & Transue 1998).<sup>4</sup> This decline has been linked to numerous factors, such as citizens' growing disaffection with public institutions (Putnam 1995), and it has been associated with various undesirable outcomes. For example, in the United States, widespread and steadily increasing levels of violent crime have been linked empirically to falling social cohesion (Kawachi, Kennedy & Wilkinson 1999) and a general erosion of social capital (Kawachi & Kennedy 1999).

While comprehensive studies have not been conducted to map long-term trends in levels of social capital in Australia, recent research by historians suggests that, consistent with worldwide trends, social capital is declining (Keen 1999), including within Indigenous Australian communities (Edney 2002). In support of this view, Cox (2002) has shown that most kinds of associational activity have declined in Australia since the 1960s, arguing that they may have been replaced to some extent by increased television viewing. Based on the premise that social capital is a public good, and given its declining levels, it has been proposed that monitoring trends in levels of social capital in Australia is an important task (Siahpush & Singh 1999).

## **1.6 Theoretical and methodological challenges in social capital research**

With this background in mind, commentary on social capital, and on what levels of social capital might be desirable in communities, is generally based on the premise that social capital is a universal public good. This premise is so pervasive that it is barely questioned in public debate. It is even embedded in definitions of social capital, such as Putnam's widely-cited definition of social capital reproduced in Section 1.3. Australian researchers and policy makers have tended to add their voices to those of their peers in other countries advocating international government action to raise worldwide levels of social capital (Fukuyama 1999).

But a note of caution is warranted. Despite what is, undoubtedly, an intuitively appealing concept apparently backed up by substantial empirical evidence, critics have raised serious and valid concerns about social capital (Macinko & Starfield 2001) and its wholesale marketing as a universal social policy solution. Evidence for its general use in addressing mental health problems is insubstantial (De Silva et al. 2005), in part

due to inadequate conceptualisation and methods (Whitley & McKenzie 2005). Some argue that research into social capital is fraught with theoretical and methodological difficulties. Thoughtful commentary points to the imperative to clarify the components of social capital (Baum & Ziersch 2003), to be cautious, particularly with respect to public policy formulation, of the currently 'atheoretical' nature of social capital (Baum et al. 2000; Hawe & Shiell 2000), to unpack factors that mediate or moderate social capital (McKenzie, Whitley & Weich 2002), and to determine the causal pathways between social capital and various outcomes in communities (Putnam 2000).

### **A normative concept**

An important criticism that must be made about the literature on social capital, including in Australia, is that it is treated as a normative concept. As Foley and Edwards (1999) point out, particularly in the political science literature, social capital is unquestioned as a public good, and this is interpreted to mean that more is desirable (Edwards & Foley 2001). The argument is that, like growth in economic capital, growth in social capital is desirable because everyone benefits from it. Edwards and Foley (1998) point out that this argument is as erroneous as proposing that an increase in Gross Domestic Product translates into a commensurate increase in every household's income. The authors point out that, despite this serious failing of logic, many researchers continue to work on the assumption that, since social capital is a public good, it is in the interest of societies to be flooded with it in the expectation that the rising general level will eventually 'lift all boats'.

While normative analytic approaches have their place (Braithwaite & Pettit 2000), an exclusively normative approach to research into social capital is a weakness with respect to scientific rigour and, consequently, to the development of valid public policy argument. That is, no sound judgments can be made about the benefits or otherwise of social capital unless the information upon which they are based rests, at least in part, on properly formulated and critiqued scientific methods of investigation. Further, in order to develop valid public policy in terms of social capital, it is necessary not just to know **whether** social capital is a public good, but also **how** it operates. This pertains to other issues of theory and of method, which are reviewed next.

### **Conceptual fuzziness**

The point has been made that the proposition that social capital is a public good is so ingrained in contemporary thinking that it is often included in its very definition. Thus it is proposed that high levels of social capital are typically found in healthy communities, and healthy communities are defined as those that possess high levels of social capital. Such propositions are clearly open to criticisms of circularity, and indeed, Putnam's work on social capital has been described as confusing cause and effect (Heying 1997). In particular, Putnam's definition of social capital has been described as being beset by 'acute definitional fuzziness' (Edwards & Foley 1998) and discussion about the nature of social capital continues to be a topic of heated debate (Lynch et al. 2000; Whitehead & Diderichsen 2001). Numerous authors have claimed that the concept has been heavily overused and, in the process, lost its meaning (for a review, see Macinko & Starfield 2001). In addition, notions of social capital are frequently confounded with related concepts, such as neighbourhood cohesion (Drukker et al. 2005; Kavanagh, Turrell & Subramanian 2006; Ziersch et al. 2005).

### **Untangling cause and effect**

Despite continuing debate about the nature of social capital, there is some consensus about the core components of social capital (**participation**, or the structural component, and **cohesion**, or the cognitive component), and some of its subcomponents have been identified (such as social trust). However, the nature of the connections between the components remains largely unexplained (Macinko & Starfield 2001; Gaudiani 1996, cited in Rich 1999). According to Putnam himself, one of the key issues to address in research into social capital is to 'untangle the spaghetti', and explore how the components of social capital are causally related (Putnam 2000, p. 137).

*Causal relationships within the concept of social capital*

There are very few studies that directly attempt to examine this issue empirically. Leighton's studies of 'The Road', summarised in Appendix A, can be interpreted as indicating that participating in the community was a precursor to the development of social cohesion; the direction of causation that can be inferred is that participating in the community led to the development of social cohesion which led, in turn, to a reduction in psychiatric morbidity. Elder's studies (also summarised in Appendix A) could be interpreted in a similar way, in that increased participation among adolescent boys led to increased sense of belonging (an aspect of social cohesion, Harpham, Grant & Thomas 2002) and lower psychiatric morbidity.

In a recent Australian cross-sectional study using path analysis, pathways from higher levels of participation to higher levels of sense of belonging and then to higher levels of social trust have been shown to be plausible (Berry & Rickwood 2000). An American cross-sectional study using structural equations modelling also found support for the plausibility of the hypothesis that levels of participation may influence levels of social trust (Brehm & Rahn 1997). The present study builds on these forerunner studies by using a larger data set with a wider range of potentially relevant variables (Section 2), including sophisticated conceptualisation and measurement of community participation (Section 3).

*Causal relationships between social capital and mental health*

While causal relationships **within** the concept of social capital have received little attention, causal relationships between social capital and various health and wellbeing outcomes have been extensively commented upon, including recent studies linking social capital and mental health. This is discussed in greater detail below, with commentary generally supportive of the proposition that high levels of social capital contribute to favourable health and social outcomes, including mental health outcomes.

**Social capital is an exclusively ecological-level phenomenon**

Some theorists have argued that social capital is exclusively a property of groups or communities (Almedom 2005; McKenzie 2003; McKenzie, Whitley & Weich 2002). This view is not widely supported, with many studies investigating social capital at the individual level (De Silva et al. 2005), though it is important to distinguish between them (Whitley & McKenzie 2005).

Social capital can be construed as existing—and can be measured—at the individual as well as at the neighbourhood or community level (Drukker et al. 2003), or even at household level (Dunham & Wilson 2007; Mitchell & Bossert 2007), in exactly the same way in which its sister constructs—financial capital and human capital—can be construed and measured at both levels. Indeed, there is debate about the many ecological levels at which social capital might be measured, about the need to fit the level of measurement to the health outcome and target group under investigation (Drukker et al. 2005), and about the need for sensitivity to history, politics, religion and other contextual factors (Macinko & Starfield 2001).

Australian research has specifically called for social capital to be construed at a variety of levels, including home, workplace and community (Phongsavan et al. 2006). It is also likely the relationship between social capital and health outcomes might be different at the individual and community level (Yip et al. 2007) and that researchers and policy makers ought to perhaps be talking about 'social capitals' (Whitley & McKenzie 2005). Further, the connection between the cognitive component of social capital and mental health might be universal, while the connection between the structural component and mental health might be context specific (De Silva et al. 2007).

The issue is not one of whether the concept of social capital exists at the individual level or not, but one of care in study design and insight into the synergies between individuals, groups and communities (Whitley & McKenzie 2005). Communities **and** individuals possess and have access to different levels of social capital; they also have different levels of mental health problems. These factors separately, and in relation to one another, need to be teased apart. What is important is to be clear about what is being measured, how, at what level and, most importantly, in response to which specific, clearly-articulated research question.



### *Individual-level studies*

In some studies, research questions pertain to the relationship between individuals' participation in their communities, their individual levels of social cohesion, and associations with individual mental health. Such studies are also useful for addressing issues of concept and measurement, and for investigating the basic epidemiology of social capital—which concepts matter and which concepts are related and how. In this case, it is appropriate to measure individual levels of social capital, or 'personal social capital' (Berry & Rickwood 2000), and to analyse them in terms of individual mental health outcomes. In these studies, as in the present study, it is appropriate to gather information on both concepts from the same participants.

### *Ecological-level studies*

In other studies, the research questions pertain to ambient community levels of social capital and their relationship to population-level prevalence of mental health problems. For example, are levels of psychiatric morbidity lower in communities that are rich in social capital? These are the most common types of studies into social capital and mental health. In these studies, data are typically gathered from a number of sources, such as national statistical collections and government health data sets. Data sets based on information collected from individuals might be used, with individual data aggregated up (De Silva et al. 2007; Kawachi et al. 1997; Sampson, Raudenbush & Earls 1997; Siahpush & Singh 1999), but data are not collected for mental health and social capital exclusively from individuals or from the same individuals. Indeed, this practice has been criticised in favour of collecting individual data from individuals and community-level data from other sources (Lochner, Kawachi & Kennedy 1999). For these studies, social capital may be measured at many different levels, including at household level (Mitchell & Bossert 2007).

### *Cross-level studies*

With reference to the argument that social capital is exclusively an ecological-level phenomenon, empirical studies linking social capital to health outcomes have sometimes been criticised for measuring community or ecological-level characteristics by aggregating data collected from individuals. As proposed above, this practice is not necessarily problematic (Whitley & McKenzie 2005), and is entirely appropriate in a third approach to studying social capital and mental health. In this approach, studies seek to examine the cross-level relationships between characteristics of communities and characteristics of individuals, assuming the possibility of a 'complex interplay' between them (Phongsavan et al. 2006, p. 2556). In this case, research questions might be about whether community-level social capital is related to individual mental health over and above relevant individual characteristics. Such research questions are often best addressed using multi-level models (Drukker et al. 2005; Drukker et al. 2003; Kavanagh, Turrell & Subramanian 2006; Lindstrom, Merlo & Ostergren 2002; Poortinga 2006b; Sundquist et al. 2006; Turrell, Kavanagh & Subramanian 2005; Veenstra 2005). In these cases, ecological and individual level data are modelled simultaneously.<sup>5</sup> All three strategies described above are valid. The issue in health research is to be clear about the research questions and, therefore, about appropriate research approaches and suitable data sources.

## **Concept operationalisation and measurement**

Most studies of the relationship between social capital and mental health are based on ad hoc and atheoretically developed measures of social capital such as the widely used Social Capital Benchmark Survey (Putnam 1995–2000), employing off-the-shelf definitions that have not been tailored to the needs of psychiatric epidemiology (Whitley & McKenzie 2005). Australian research has not been immune to this problem, with researchers calling for deeper analysis (Phongsavan et al. 2006). At times, entire studies and their conclusions have been based on a single-item measurement of one aspect of social capital, such as trust (Lindström & Lindström 2006). Some authors recognise the difficulties in interpreting findings when there has been inadequate conceptualisation and measurement (Ziersch & Baum 2004). Yet, with the exception of occasional factor analyses (Harpham, Grant & Thomas 2002), often with confusing results (Hyyppä & Maki 2003; Mitchell & Bossert 2007), there has been very little thorough scientific analysis with respect to defining and measuring concepts for investigating the epidemiology of social capital (Macinko & Starfield 2001). Adequate definition

of concepts has also been hampered by a lack of studies combining quantitative and qualitative methods (Almedom 2005).

Even studies that have overtly aimed to address this issue have:

- confused structural and cognitive components of social capital, including them in one measure without proper development of their constituent items (for example, De Silva et al. 2006)
- confused the elements of social cohesion (cognitive social capital), such as trust and reciprocity (Yip et al. 2007), and trust and cohesion (Araya et al. 2006)
- confounded types of social capital and levels of measurement (Mitchell & Bossert 2007).

Attempts to clarify issues of conceptualisation and measurement have perhaps led to a bewildering array of possible approaches (Whitley & McKenzie 2005).

Recent Australian research by Berry and colleagues into defining and measuring community participation and social trust has perhaps helped elucidate these two concepts (2000, 2003, 2007). The present study aims to contribute further to addressing problems of concept operationalisation and measurement by:

- extending empirical investigation of community participation to include subjective perceptions
- further investigating social trust
- modelling personal social cohesion
- using structural equations modelling to examine linkages among these concepts and their associations with mental health.

## 1.7 Social capital and mental health

Despite concerns about the theory and empirical testing of social capital, there is now a large literature linking higher levels of social capital, and community participation in particular, to better health. Despite continuing problems with definitional fuzziness, a parallel literature is emerging that indicates this is also the case for mental health (Whitley & McKenzie 2005). A growing number of cross-sectional studies, together with a few prospective studies, indicate that participating in the social and civic life of communities is protectively linked to the onset and course of mental health problems and to recovery from them. Such evidence now exists for a wide range of mental health problems, including depression, anxiety, psychosis, schizophrenia, general psychological distress and cognitive decline. Evidence also indicates that the relationship between community participation and social capital more generally holds throughout the life course, for women and for men, for people from a very wide range of ethnic backgrounds, all around the world, in rich and poor nations and in rural and urban settings. For a review of this literature, see Berry, Rodgers and Dear (2007).

While social capital in general and community participation in particular may represent a valuable health opportunity for everyone, they are not evenly available across the population. Certain ethnic (Lindstrom 2005) and socioeconomically disadvantaged groups (Stone, Matthew & Hughes 2003) report low levels of community participation and elevated levels of associated health problems (Baum et al. 2000). These findings indicate the need to understand social capital, as it relates to mental health, more clearly.

Systematic investigation of an aspect of structural social capital, types of community participation, has been undertaken in Australia. Berry, Rodgers and Dear (2007) have proposed that there are 14 empirically and conceptually distinct types of participation. While research into community participation and mental health in Australia has shown that participation is linked to lower levels of distress (Phongsavan et al. 2006), research into how different types of participation might be associated with general psychological distress has proposed that not all types of participation are, in fact, significantly independently related to distress (Berry, Rodgers & Dear 2007).



Only nine of the 14 were. Indeed, only seven types of participation out of the original 14 were linked to **fewer** symptoms of distress—social contact with household members, extended family, friends and neighbours, taking an active interest in current affairs, getting involved in local community activities and religious observance. The other two types of participation that were linked to mental health (expressing opinions publicly and getting involved in community activism) were linked to **higher** levels of distress. The findings that (some forms of) community participation were linked to lower levels of distress are consistent with the literature (for a review, see De Silva et al. 2005). The findings that some types of participation were not, or were linked to worse distress, are consistent with the warning to be cautious with respect to promoting social capital as a general psychiatric panacea (Whitley & McKenzie 2005).

## 1.8 Direction of the relationship between social capital and mental health

The focus of this study is the relationship between mental health and a particular way of conceptualising the social environment, social capital. While consideration of the links between the social environment generally and mental health is mature, as described in the subsections above, there remains considerable debate about the direction of the relationship between social capital and mental health. In summary, there are three explanatory frameworks for accounting for links found between social capital—community participation in particular—and mental health. The first is that they are not linked and that apparent links are spurious, arising from common underlying factors. These factors can be intrinsic to the individual (such as personality) or extrinsic (such as poverty), with both separately causing lower levels of social capital (for example, lower levels of community participation) **and** mental health problems.

The second explanatory framework is that social capital and mental health are linked because mental health problems create barriers to participating in the community and to the establishment of successful relationships. The third explanatory framework proposes that levels of social capital influence the development and experience of mental health problems. The social capital hypothesis is the hypothesis that is:

- most closely linked with the findings of the early studies in psychiatric epidemiology
- the least researched of the three explanatory frameworks
- the focus of the present study.

The explanatory frameworks are discussed below. Because community participation is the focus of much of the literature, it is the focus of the sections that follow.

### Participation and mental health are not linked

The proposition that participation and mental health are not linked rests on evidence that confounding factors cause differences in the nature and level of people's community participation and, separately, in their mental health outcomes. There is no research directly addressing the relationship between confounding factors, mental health and levels of participation. However, there is other relevant work with studies indicating that putative confounding factors can be intrinsic or extrinsic.

#### *Intrinsic confounding factors*

Personality is an example of an intrinsic confounding factor that can affect community participation and mental health. We have cited evidence above that demonstrates that personality factors can affect individuals' social environment generally. For example, neuroticism (emotional instability) attracts adverse interpersonal interactions (Poulton & Andrews 1992). Personality has also been linked directly to mental health problems (Heikkila et al. 2004) such as psychological distress (Lincoln, Chatters & Taylor 2003) and burnout among students (Jacobs & Dodd 2003). In addition, personality may separately influence aspects of people's social environment **and** their mental health outcomes. For example, personality has been found to independently

predict mental health problems and levels of social support (Sarason & Sarason 1982). In this study, people who tended towards inflexible, conventional and hostile personality profiles reported lower levels of social support and were less happy and more worried than their more flexible, tolerant peers.

Another form of evidence that personality influences mental health outcomes is that mental health interventions can be more effective if they are tailored to suit people's personality types. For example, in a study of people whose mental health problems required residential treatment interventions, an assessment of personality was used with success to select appropriate treatment programs (Fassino et al. 2004).

### *Extrinsic confounding factors*

It has been proposed that 'most mental health problems have neither psychological causes nor psychological solutions, but are socially caused and can only be socially solved' (Fryer 1999). Two examples of socially caused or extrinsic factors that can separately influence both community participation and mental health are presented here: poverty and unemployment.

A relationship between poverty and mental health is clear in developing economies where poverty is extreme and evident (Harpham, Grant & Rodriguez 2004; Mubarak et al. 2003). A review of 11 community studies of the relationship between poverty and mental health in a variety of developing economies indicated that, over the last decade, poverty has consistently been a risk factor for the development of mental health problems (Patel & Kleinman 2003). Following on from pioneering British work on the social aetiology of mental health problems (Brown & Harris 1978), a relationship between poverty and mental health continues also to be found in developed economies (Almog et al. 2004; Mauksch et al. 2003; Taylor, Jason & Jahn 2003). Poverty has been linked, in addition to general levels of mental health problems, to specific mental health problems. For example, it is among the factors that have been found to trigger the onset of schizophrenia (Mueser & McGurk 2004). Poverty is also linked to lower levels of community participation (Baum et al. 2000).

A review of the relationship between income support receipt and mental health summarised evidence showing that unemployment can lead to the development of mental health problems among a variety of groups within the general population, such as older men who had lost their jobs, and young people undergoing the transition from school to work (Butterworth & Berry 2004). Indeed, around the world, unemployment contributes significantly to the onset of, and difficulty recovering from, mental health problems (Akhavan et al. 2004; Brown et al. 2003; Dooley 2003; Fryer & Fagan 2003; Matoba, Ishitake & Noguchi 2003).

Mostly, unemployment contributes to the development of common mental health problems, such as depression (Barkow et al. 2003). But the links between unemployment and mental health problems can be very specific. For example, in Japan, unemployment has been directly causally linked to completed suicides by hanging (Abe et al. 2004). Unemployment, or loss of employment, is also linked to lower levels of community participation (Lauder, Mummery & Sharkey 2006).

### **Mental health problems are a barrier to participation**

The second proposition is that the link between community participation and mental health is not spurious but that they are causally connected: the proposed explanation is that community participation is related to mental health because mental health problems damage connections to and within the social environment. For example, seminal longitudinal research has demonstrated that people experiencing severe and enduring mental health problems migrate over time to socioeconomically disadvantaged areas (Faris & Dunham 1939). Known as 'social drift', this occurs because their socioeconomic circumstances degrade the longer their illness continues, and they have to move to more disadvantaged localities. In the process, these people slowly lose their connections with the community and opportunities for participation and inclusion, becoming increasingly marginalised. People with serious mental health problems also differ from others in their patterns of residential mobility, moving house more often and moving to certain types of, usually, less advantaged communities (Dembling et al. 2002).

One mechanism for this is that people with mental health problems often experience difficulties in managing interpersonal relationships (Hendry & Reid 2000; Johnson et al. 2000; Kato 2003; Lee, Draper & Lee 2001; Sarason & Sarason 1982; Segrin 2000), or avoid contact with others out of shame or fear of stigma (Angermeyer et al. 2004; Corrigan & Miller 2004; Gattuso, Fullagar & Young 2005; Herrman 2001; Hickie 2002; Jamison 2006; Johnsen et al. 1997; Keusch, Wilentz & Klienman 2006; Link & Phelan 2006; Mueller et al. 2006). A recent Swedish study even revealed that the degree of social isolation faced by people with mental health problems is related to and reflected in higher rates of dying alone (Thiblin et al. 2004). Relationships are a cornerstone of social capital, with isolation a particular problem for people at risk of mental health problems (Whitley & McKenzie 2005).

This is a substantial problem, because people with mental health problems find themselves excluded from participating in their communities in a wide variety of ways (Bonner, Barr & Hoskins 2002), and isolation and alienation are common features of their lives (Mubarak et al. 2003). Indeed, studies from around the world show that people living with mental health problems not only feel isolated, but they share a history of being actively rejected by the general community (Madianos et al. 1987; Phelan et al. 2000; Rahav, Streuning & Andrews 1984; Smith 1981). Even groups that have come together in the community with the goal of supporting people with mental health problems occasionally reject some members. For example, mental health support groups have been shown to form and enforce strong behavioural norms, and violations of those norms have at times been punished by exclusion from the group (Parr 2000).

As described above, there is an extensively documented causal pathway from unemployment to psychiatric morbidity. That is, unemployment, which is a form of exclusion from participation in the community, can contribute to the development of mental health problems. The reverse is also the case, and mental health problems can contribute to the failure to find employment, or to the loss of employment (Danziger et al. 2000; Danziger, Kalil & Anderson 2000; Derr, Douglas & Pavetti 2001; Derr, Hill & Pavetti 2000; Lennon, Blome & English 2001). In addition, people who have lost paid employment commonly report feeling rejected by and alienated from the general community (Strohschein 1998), and this is linked to mental health problems (Forbes et al. 2003; Mills et al. 2004).

Another form of evidence of the causal impact of mental health problems on economic participation is that programs for addressing mental health problems can be remarkably effective in helping people find or retain employment (Butterworth & Berry 2004). Effective programs have included cognitive therapies, and training to enhance personal effectiveness skills, such as mastery and resilience. Of particular relevance to this study, one of the most effective forms of mental health intervention with respect to employment was assisting people in building their social networks (Harris, Brown & Robinson 1999).

### **Lack of participation can cause mental health problems**

This is the explanatory framework most strongly supported by the studies in psychiatric epidemiology reviewed earlier in this section. For example, Leighton showed that the first achievement of the people of The Road, raising money to get electricity connected in the church hall, was based on their coming together to address a collective need (Leighton 1965). That is, people who had previously had little to do with one another met to work out how they would collectively attain an important shared goal. Prior to their coming together, rates of psychiatric morbidity were substantially higher than they were after they had started meeting. This participation in the community was the initiating force in the process of recovery within the community.

Echoing these community-level findings at the individual level, Elder and Caspi looked at the differential effects of participation and non-participation on adolescents growing up in the Great Depression (Elder & Caspi 1988). This research showed how withdrawal from the community led to the development of mental health problems among adolescent girls, while heightened involvement in the community was protective against the development of mental health problems among adolescent boys. It can be inferred that lack of participation played a causal role in the development and prevention of mental health problems among adolescent girls and boys respectively. Community participation was associated with positive psychological outcomes, and protective against the development of negative outcomes.

More recent studies have reported similar findings. Higher levels of individual connectedness are associated with fewer mental health problems (Kawachi & Berkman 2001; Lee, Draper & Lee 2001; Twenge 2000; Wainer & Chesters 2000), including among adolescents (Bond et al. 2001). For example, in a study of over 1,200 Scottish adolescents aged 12 to 18 years, participating in social activities with peers was a protective factor against the development of mental health problems, and difficulties in social relationships were a source of distress (Hendry & Reid 2000). Another study involved over 12,000 American high school students who participated as part of the National Longitudinal Study of Adolescent Health (Resnick et al. 1997). The study found that two aspects of connectedness (to family and to school) were more strongly associated than any other factors with lower levels of problems. These problems included distress, suicide ideation and attempts, violence, substance misuse, and risky sexual behaviour.

Participation in the community, or connectedness to others, is particularly important for people whose experiences in society are less easy, as a group, than they are for other groups, such as for New Zealand Maori (Huriwai et al. 2000). Another study looking at the experience of particular groups within the community compared the social connectedness and mental health of immigrants with those born in the community (Hao & Johnson 2000). Participating generally in the community, religious observance, and being in a relationship were beneficial to everyone's mental health, but particularly to the immigrant residents.

Participation has also been shown to have a role in the course of mental health problems. That is, it has been argued that lack of participation inhibits recovery from mental health problems once they have started. For example, lack of participation has been associated with difficulty recovering from depression following the onset of an episode (Prince et al. 1998). Thus, even where lack of community participation is not a primary cause of the onset of mental health problems, it has an intermediate, or mediating, causal effect on their course.

### **Causal relationships between social capital and mental health are reciprocal, interactive and indirect**

It has been proposed that:

- differences in individual mental health influence people's social environment generally, including their levels of community participation
- the social environment, including ambient levels of community participation, influence individual mental health
- the two pathways are most likely reciprocally related.

In addition to the complexity inherent in reciprocal relationships, factors in the social environment and mental health outcomes are linked via interactive and indirect causal pathways. For example, while one study found poverty to be a direct risk factor for the development of mental health symptoms, mental health problems developed **primarily** as a result of other factors, such as lack of education, vulnerability to violence, ill health, insecurity and despair, all of which were the direct result of poverty (Patel & Kleinman 2003). The same complexity and indirectness of effect is expected in any relationship between social capital and mental health, and there is some evidence for this proposition (Poortinga 2006a). This is the case partly because there are causal relationships implicit within the concept of social capital itself and partly because social capital is a mediator of the relationship between broad socioeconomic and cultural environment and mental health outcomes (Drukker et al. 2005).

#### *Social capital mediates the relationship between the broad macro-social factors and mental health*

It has been asserted that it would be simplistic to treat social capital as if it had a life apart from its political and social context (Edwards & Foley 1998). Thinking back to the studies in early psychiatric epidemiology, community participation was an important component of the causal pathways connecting factors in the wider social environment—such as widespread economic depression—and mental health. That is, one of the reasons

that features of the social environment, such as economic depression, affected mental health outcomes was because it affected the extent and nature of community participation. Thus, community participation was a mediator of the relationship between the social environment and mental health.

It has been proposed that community participation is one of the core components of social capital (Heying 1997). Thus, if community participation is a mediator of the relationship between the social environment and mental health, then social capital more broadly must be a mediator of any such relationship, and this has been proposed (Tucker 2002). Indeed, some researchers have suggested that socioeconomic factors (such as income inequality<sup>6</sup>) can cause increases in negative outcomes in communities **because** they can diminish social capital (Kawachi et al. 1997). While the relationship between income inequality and health has been challenged (Lynch et al. 2004), substantial evidence remains (Marmot 2001; Wilkinson & Pickett 2006) and it must be considered an important background factor that could operate through its influence on social capital.

Indeed, the economic backdrop to people's lives, especially absolute levels of individual income and relative deprivation (Marmot 2001), play a significant role in influencing outcomes, even after taking account of a range of important community and individual level factors. In addition, cross-cultural research, including research in a range of countries, has shown that macro socioeconomic policies shape health outcomes for citizens, and that different approaches lead to different outcomes (Barbieri 1998; Van-Rees 1991).

## 1.9 Research questions, aims and hypotheses

The purpose of this research is to describe the relationship between breadth of participation and perceptions about participation, to investigate their shared relationship with general psychological distress, and to examine the plausibility of the social capital hypothesis as a valid explanation for links between participation and distress. The research question for this project is:

Within a disadvantaged rural Australian population, how frequently do people participate in different domains of community activities, to what extent do they consider their participation adequate and enjoyable, and how are these factors related to their levels of personal social cohesion and their mental health?

The aims of the project are to investigate in a disadvantaged rural Australian population the:

- extent to which people consider their levels of community participation to be adequate
- extent to which people enjoy participating in different types of community activity
- relationship between levels of community participation, and sense of adequacy and enjoyment of participation
- relationship between levels, adequacy and enjoyment of participation, and personal social cohesion (sense of belonging, trust, reciprocity and optimism)
- relationship between levels, adequacy and enjoyment of participation, personal social cohesion, and mental health.

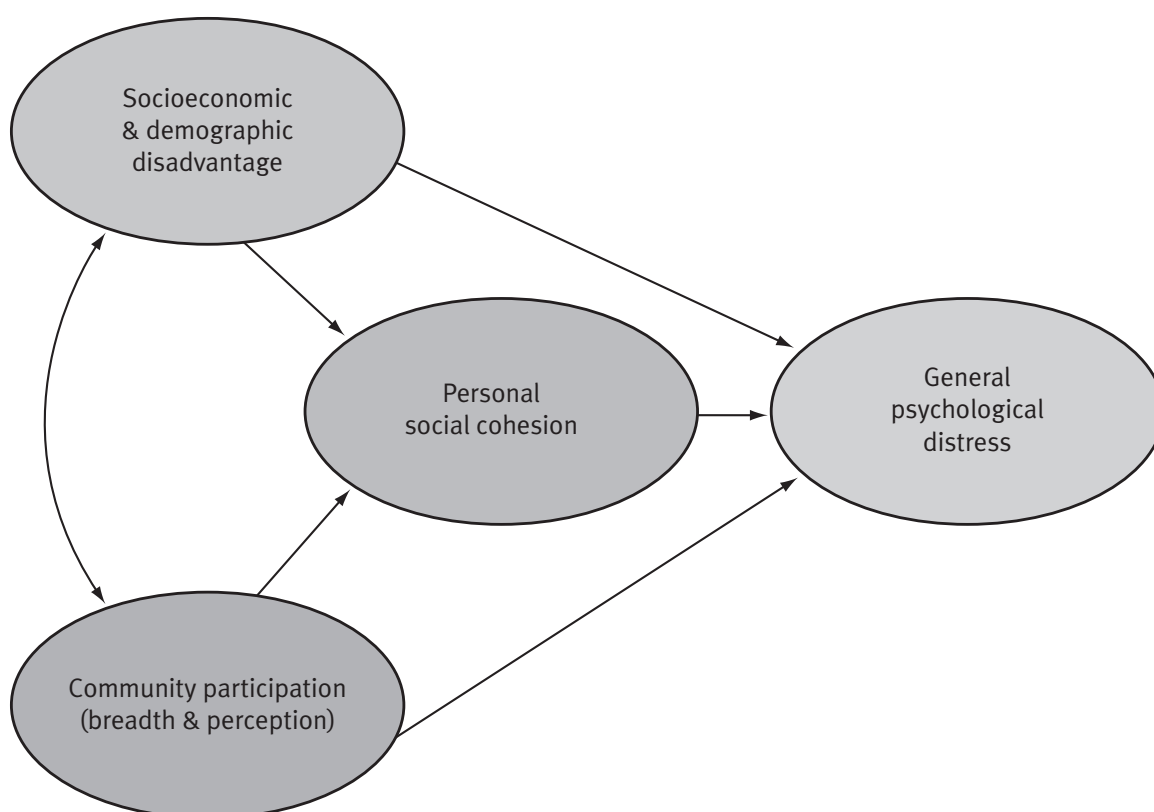
### Conceptual model and hypotheses

The research question and aims for this study are located within a framework developed from social capital theory. This theory suggests that social capital is a major mediator of the relationship between factors in the macro social environment and mental health outcomes. The present study focuses on personal social capital, which is made up of two causally linked components—structural (individual patterns and levels of community participation) and cognitive (individual experiences of social cohesion, 'personal social cohesion'). In this study, the outcome of interest is mental health, operationalised here as general psychological distress (see Section 2 for rationale and details). Thus it is proposed that participating in the community enhances levels of social cohesion which, in turn, influences mental health outcomes. This proposition is represented in the conceptual model shown in Figure 1.

In Figure 1, socioeconomic and demographic disadvantage are correlated with levels of community participation in recognition of the literature reviewed above linking disadvantage with social capital (for a recent Australian study, see Phongsavan et al. 2006). Both disadvantage and community participation separately influence levels of personal social cohesion which, in turn, influences levels of general psychological distress. This is consistent with health research generally, in which social cohesion has been shown to directly predict better health outcomes (Yip et al. 2007). A residual (independent) relationship between disadvantage and participation with distress is included to reflect the possibility that personal social cohesion is likely to be only one of the possible mediators linking disadvantage and participation to general psychological distress.

Consistent with the social capital hypothesis, it is proposed that community participation and personal social cohesion will be positively associated such that those reporting higher levels of, and more positive perceptions about, participation will also report higher levels of cohesion. Personal social cohesion will be negatively associated with general psychological distress such that those reporting higher levels of cohesion will report lower levels of distress.

**Figure 1: Conceptual model of personal social capital and general psychological distress**



## 1.10 Project outcomes and presentation of findings

### Project outputs and outcomes

Outputs from this study include the present report and the preparation of a paper for publication in a peer-reviewed journal based on the study findings reported here. The findings of the study were presented at the Department of Families, Community Services and Indigenous Affairs Social Policy Research conference held in Canberra in November 2006 and have since been presented at the Hanoi School of Public Health,

Vietnam (11 April 2007), at Queen Mary College, University of London (18 April 2007), and at the International Federation of Psychiatric Epidemiology conference in Gothenburg, Sweden (5 May 2007).

The present study builds on previous research conducted by Berry and colleagues and forms the conceptual and technical basis for a program of research from 2007–09 using the Household, Income and Labour Dynamics in Australia (HILDA) survey<sup>7</sup> into the relationship between social capital and mental health (two studies) and into their shared relationship with retirement, care giving, drought and urban environments (four studies).

The present study and the five current 2007–09 studies form part of an ongoing collaboration between the chief investigator and the department with respect to the department’s responsibilities for the development of policies and programs for Australian communities. The policy relevance of the findings of the present study is discussed in Section 6 of this report.

### **Presentation of findings**

Section 1 of this report introduces the study with a rationale, reviews of appropriate literature, and aims and hypotheses. Methodological issues are discussed in Section 2, which also provides a description of the measures and analytic techniques used. The concept and measurement of community participation are explored in Section 3, and considered together with components of social cohesion in Section 4. Using structural equations modelling, Section 5 presents an assessment of the personal social capital hypothesis as a possible explanation for the link between community participation and mental health. A review of the study, including its main findings, limitations, possible policy relevance and future research requirements are presented in Section 6. Several appendixes are also included to provide supplementary information on matters presented in the main body of the report.





## 2 Data and methods

### Section summary

This section begins by presenting an overview of methodological issues in research into social capital and mental health. Following this is a description of the *Eurobodalla Study*, including background information about the Eurobodalla Shire in southern New South Wales, Australia, and why this location was chosen for the study. Information about the shire was provided by the Eurobodalla Shire Council social planner, whose assistance is acknowledged. The methodological approach, sampling strategy, participants and procedures are documented, followed by details about the extent and handling of missing data, measures used and analytic procedures. Material presented in this section is supplemented by further detail provided in the appendixes to this report.

### 2.1 Methodological issues: background to the study

Disentangling the components and operation of social capital, and taking into account the direct and indirect effects on mental health of factors in the social environment, must be undertaken within a framework of sound research design and methodology. Only in the presence of sound methodology is it possible to make reliable, valid conclusions about the subject of the research. The conceptualisation and measurement of social capital are still in their development phase (Harpham, Grant & Thomas 2002) and much work remains to be done (Zubrick 2007). Two major criticisms of the conduct of research into social capital are directly addressed in the present study: data mining and concept operationalisation and measurement. They are briefly reviewed below.

#### *Data mining*

A common method of conducting research into social capital involves data mining, or locating existing databases that appear to contain relevant material, and examining them post hoc and atheoretically in order to draw conclusions about social capital. This is a major method of inquiry applied by Putnam and those who have based their approaches on his. Typically, the databases these researchers mine contain information collected from surveys, such as the American General Social Survey. Using surveys to collect data for research into social capital is a generally accepted method. But the opportunistic use of existing databases is unacceptable because these studies were not designed to operationalise properly the complexity of social capital (Edwards & Foley 1998). Some authors, including in Australia, have acknowledged this difficulty with respect to studies into social capital and mental health (Phongsavan et al. 2006).

At the same time, it would be unhelpful to deny that opportunistic data mining has a place in research, particularly with respect to identifying interesting social issues and deriving general research questions. Putnam's research is an example of how valuable it can be. In addition, there are many cases in health research in which quite targeted databases have been combined to shed considerable light on health issues in relation to social capital (Drukker et al. 2005; Drukker et al. 2003). But theory development demands more than this. It requires valid, reliable data that can be interpreted in response to testable hypotheses, and that has been designed before the research was done around **specific** research questions. To achieve this, purpose-designed studies that properly test a coherent theory are required. For this reason, for the present study, new data were collected around a study concept that was designed specifically to test the personal social capital hypothesis of the relationship between social capital and mental health.

### *Concept operationalisation and measurement*

An important part of conducting this research was having valid and reliable measures of constructs. From a scientific point of view, there is little to be gained by adopting an appropriate research strategy if the concepts and components of interest cannot be accurately operationalised and validly measured. Concept operationalisation and measurement have been particularly poor in social capital research, partly because of the fuzziness of the concept. The *Eurobodalla Study* was purpose-designed to test a specific operationalisation and measurement strategy, the elements of which are described below. One of the achievements of the study has been to enable a detailed clarification of the concept of community participation and its measurement (Berry, Rodgers & Dear 2007), on which the present study builds.

## **2.2 The Eurobodalla Study**

### **The Eurobodalla Shire**

The Eurobodalla Shire covers over 3,000km<sup>2</sup> of the New South Wales south coast, including 110km of coastline. Nearly 80 per cent of this area is national park or state forest, and the climate is mild. People live mainly along the coastal fringe in three main towns, though about one-fifth is spread across more than 50 other townships or rural localities. The Eurobodalla Shire's main industries are retail, tourism, manufacturing, agriculture, service industries, dairying, forestry and fishing. Local social planning consultation conducted by the Eurobodalla Shire Council indicated that people like living in the shire. This liking was based on lifestyle factors, such as the clean environment, pristine beaches, bushland and, importantly, what were described as small, safe, family-friendly communities.

Only half of the shire's ratepayers reside in the shire, while another third live in the two closest capital cities, Canberra and Sydney. The permanent population of the Eurobodalla Shire is growing at just over 2 per cent a year, compared with a state average of just over 1 per cent, and was about 38,000 in 2001 at the time the data were collected. Perhaps reflecting its status as a popular retirement destination, the population is heavily weighted towards the older age groups, with nearly 23 per cent aged over 65 years in 2001, compared with a state average of 14 per cent in 2001. Based on data from the 2001 Census, there were 1,378 people who identified as Indigenous Australians living in the shire, or a little over 4 per cent of the shire's population.

Together with the age profile of the shire, limited employment and few tertiary educational opportunities for young people might contribute to explaining why only 9 per cent of the population were aged 15 to 24 years in 2001, compared with 13 per cent statewide. In March 2000, 17 per cent of adults were unemployed and, with many of the employment opportunities part-time or casual and seasonal, many of those in paid work were underemployed and not able to earn a living wage. In 1996, 27 per cent of the population received social security benefits of some type, and median income was about 70 per cent of the state average. However, over half of people owned their own homes, compared with a state average of 41 per cent. Based on 2001 Census data, among people aged 15 to 75 years in the Eurobodalla Shire, only 27 per cent had completed educational qualifications beyond Year 12, far fewer than for the state as a whole (38 per cent). Thus residents of the shire were less highly educated, on average, than most residents of New South Wales.

Reliable data on the level of provision of services such as transport, medical and mental health services were not available at the time of writing. However, feedback from respondents indicated a perceived shortage of such services was a significant source of concern for many.

### **Study location and methodological approach**

The study was conducted in the Eurobodalla Shire for two main reasons. One was that there is growing research and public policy interest in mental health outcomes for people living in rural and remote parts of Australia (for example, Fuller et al. 2004; Habibis et al. 2003), particularly with regard to the considerable socioeconomic disadvantage and poor access to services that accompany living far from population centres (Caldwell et al. 2004). That is, those living in rural areas experience a very high level of disadvantage

(Alston 2002) and consequent high levels of need. They also find it difficult to access services compared with their urban peers (Johnstone et al. 2002). As a rural locality, the Eurobodalla Shire presented an interesting combination of characteristics. Despite its beautiful coastal location and attractive lifestyle, it is nevertheless a poor and poorly serviced rural area.

The other reason that this study was conducted in the Eurobodalla Shire was that the shire council has a commitment to promoting social and epidemiological research in the shire. Research findings are used to inform policy and planning activities. This created opportunities for engagement with the local government based on research evidence.

### *Methodological approach*

The opportunistic use of existing survey data is not considered an acceptable way to conduct research into social capital (Edwards & Foley 1998). Indeed, data mining using existing surveys, as is common in social capital research, fails to properly operationalise the complexity of the concept. New, purpose-built instruments are needed which properly test a coherent theory. This survey was therefore purpose-designed to enable exploration of different types of participation and to evaluate the relationship between general psychological distress and community participation. Survey methodologies in which data are collected from individuals are an acceptable way to conduct research into social capital (Edwards & Foley 1998), and it was appropriate to conduct a survey for this study. Conducting a survey by mail had additional benefits with respect to the research goals. It permitted the collection of the large quantity of data required for many of the analyses, and allowed data to be collected in a format that was appropriate for the kinds of analyses that were planned. Further, compared with telephone or face-to-face interviewing, it was an inexpensive and fast way to collect data from the population of interest, and to reach people living in rural and sometimes difficult to access localities.

## **2.3 Participants and sampling**

Participants were 963 residents of the Eurobodalla Shire in southern New South Wales, Australia. The stratified sampling procedure was employed to recruit equal numbers of women and men to the study. With 500 women (51.9 per cent) and 463 men (48.1 per cent), women were very slightly, but not significantly, overrepresented in the sample ( $\chi^2=1.42$ ,  $df=1$ ,  $p=0.233$ ).

Participants were aged 19 to 97 years ( $M=52.78$  years,  $SD=18.24$ ,  $Md=52$  years). With factor analyses among the statistical methods intended for this study, it was not only important to gather enough data for the planned analyses, but also to ensure that the sample provided a spread of scores across the ranges of the variables and concepts measured (Tabachnik & Fidell 2001). With the expectation that types and levels of participation would vary between women and men and different age groups, it was essential to collect data from roughly equal numbers of women and men and from a wide range of adult age groups. A stratified random general population sample was appropriate.

With the permission and assistance of the Australian Electoral Commission, a stratified random sample of 3,000 potential participants was drawn from the electoral roll for the relevant parts of the Eden-Monaro electoral district, within which the Eurobodalla Shire falls. In Australia, where registration as a voter and voting in elections are compulsory, electoral rolls are an accepted source for general population sampling. Only people whose mailing address was in the Eurobodalla Shire were selected. The electoral roll data were made available by sex and in eight 10-year age blocks from 18 to 97 years.

Response rates among men of working age were low, and women were overrepresented in the sample. In order to compensate for this imbalance, a further 1,200 working-age men were sampled in a second round. A response rate of up to 20 per cent was expected for this study (Clark, Khan & Gupta 2001), and an adjusted response rate of 30.1 to 32.1 per cent achieved. A detailed discussion of the response rate and representativeness of the sample is included in Appendix B.

## 2.4 Procedure

Participants completed a self-report questionnaire containing 241 items, which took about 60 minutes to complete. Data were collected twice, from two different sets of participants (as described above), each time over a six-week period. The first round of data was collected in September and October 2001, and the second round in April and May 2002. Introductory letters were sent to the initial round of 3,000 possible participants, followed a week later by a package containing the questionnaire, a covering letter, an information sheet, and a pre-paid return envelope. One week after the mailing of the study materials, local newspapers and radio stations broadcast reminders to people to participate in the study. A similar procedure, also with media support, was followed when the second round of 1,200 possible male participants was approached, but no reminder postcard was sent.

Participation by Indigenous Australians was considered highly desirable and to encourage this contact with the Indigenous community was handled through the shire council's Indigenous liaison officer. Indigenous Australians represented about 4.2 per cent of the population of the Eurobodalla Shire in 2001, and were 8.7 per cent of the sample. Thus, though there had been no oversampling, Indigenous Australians were represented in the study at about twice the rate that they were represented in the local communities of the shire. Sample statistics on other sociodemographic characteristics were broadly consistent with population parameters for the region available from the Australian Bureau of Statistics Census data for 2001.

With regard to when respondents participated in the study, there were no differences between those who participated before the reminder postcard was sent, those who responded following the reminder postcard, and the new sample of men who participated as part of the second round of data collection. The three groups were compared using chi-squared statistics with respect to level of education, paid work or study status, Indigenous status, being born overseas, having dependents, having a health care card, and living alone. All comparisons were between working-age men since the second round participants only included working-age men.

## 2.5 Software, data screening and missing data

All data analyses for this study were conducted using SPSS 15.0 for Windows (Statistical Package for Social Sciences, SPSS Inc.) and AMOS 7.0 (James L Arbuckle, 1994–2003, SmallWaters Corp.). Figures were produced using SPSS and AMOS, and on Microsoft Excel (Microsoft Corporation 2004). A data entry operator entered all data and accuracy of data entry was assessed (and found to be accurate) by checking data entry for a random selection of approximately 150 questionnaires, and examining frequencies for all variables to detect out-of-range values and missing data. All out-of-range values and missing data were individually checked against the questionnaires.

There were only six data entry errors, but there was a substantial amount of missing data (defined as more than 5 per cent for any measure). Missing data present challenges for data analysis. In particular, some of the techniques used in this study, such as one-factor congeneric modelling and structural modelling, required complete data. It was therefore necessary to address the missing data.

### Handling missing data

Inspection of the frequencies for the 977 returned questionnaires revealed that eight questionnaires contained almost entirely missing data, and these cases were deleted. The remaining missing data occurred mainly on three measures:

- social contact with workmates (four items)
- contact with household members (four items)
- numbers of dependents in particular age groups (four categories).

Almost half of the respondents ( $n=428$ ) had not answered the items on social contact with workmates. For certain respondents, it could be assumed that the reason they did not complete these items was because they were not in paid work and did not therefore have workmates with whom they could socialise. It was thus likely that they skipped those items because the items did not apply to them. Respondents who were assumed to be in this situation were those who reported that they undertook 0 hours of paid work each week, or who were aged over 60 years (and could be assumed to be in retirement), or both, and who had otherwise returned complete data. These respondents were attributed scores of 1 (no, or almost no, contact with workmates) for each of the four social contact with workmates items. Following this, 3 per cent ( $n=31$ ) of respondents still had missing data on these items.

About 9 per cent ( $n=83$ ) of data on contact with household members were missing. Those respondents who indicated on a related item that they usually lived alone were assumed to have no contact with household members because there were no other household members with whom they could have contact. They were attributed scores of 1 (no, or almost no, contact with household members) for each of the four relevant items, providing they otherwise returned complete data. Following this, 3 per cent ( $n=35$ ) respondents still had missing data on these items.

Around 11 per cent ( $n=107$ ) of data on numbers of dependents within particular age-group categories were also missing. Respondents who answered 'no' to the item asking them if they had any dependents (yes or no), and respondents aged over 60 years (24 respondents), were assumed to have no dependents and were attributed a score of 0 for each of the age-group categories. Following this, 2 per cent ( $n=20$ ) of data remained missing. There were no differences in levels of participation between those who had missing data and comparable respondents who did not, and details are not reported here.

### *Missing data imputation*

It was possible, as described above, to replace a substantial proportion of the missing data by inferring why the data were missing and, therefore, what the respondents would have been likely to have reported. Following this, however, a small amount of all data was still missing, though not more than 3 per cent for any measure. Given that for some of the analyses required for this study, the data set could contain no missing data, it was necessary to address this remaining amount. Two options were possible, to delete cases, or to impute values to replace missing values.

As the amount of data missing was very small, spread evenly among participants, and not concentrated in particular measures, missing values were imputed. This is most accurately done using full information maximum likelihood (FIML) estimation, which is a missing data replacement method that uses regression-like algorithms based on the full data set. This method assumes no bias, but is nevertheless robust to bias in the missing data. The procedure was conducted in SPSS, using commands from the 'missing values analysis' option, on a copy of the original data set. Among its outputs, FIML estimation produces mean scores and standard deviations for all variables before and after the replacement procedure. If these scores are similar, the imputed values can be accepted and imported into the main data set. For these data, mean scores and standard deviations for all variables before and after the procedure were identical or near identical in all cases, and the imputed values were therefore accepted. The final data set contained complete data for all respondents.

### *Outliers and score rounding*

Two further procedures were necessary, checking the data for univariate and multivariate outliers, and rounding scores. Imputed scores for nominal categorical variables, such as having dependents (yes/no), were rounded to the nearest whole number. The data set was then examined for outliers. There were no univariate outliers, but six cases were deleted because they were extreme multivariate outliers identified via Mahalanobis Distance and Cook's D statistics. Together with the eight cases that had been deleted because they had too much missing data, in all, 14 cases were deleted. This left a total sample of 963 cases with complete data. With 963 usable responses, the size of the final data set was considerably larger than the minimum requirement for the planned analyses for this study.

## 2.6 Measures

### Community participation

Measures of frequency and breadth of community participation, and of perceptions about community participation, were included in this study. Breadth of participation was measured using the Australian Community Participation Questionnaire (ACPQ). Information about the development of the ACPQ has been reported elsewhere (Berry 2008, reproduced in Appendix C). This material is supplemented by further information in Appendix D (about the development of items for the ACPQ) and Appendix E (fit statistics for scale modelling and a full list of the final questionnaire items). The development of measures of subjective perceptions about community participation used in this study are described in Section 3.

Networks of participation are frequently assessed using network analysis. This form of analysis is impractical for large-scale epidemiological surveys. It also typically focuses on informal social connections, such as those to family and friends, or is undertaken within workplaces. This does not capture the full range of types of participation in which people can engage in their communities. Measuring breadth of participation using a survey instrument is practical and workable and covers the full range of types of participation. It might also be a reasonable proxy for extent and intensity of social networks, as breadth of participation could be expected to be correlated with network characteristics. This should be tested in future research.

### Personal social cohesion

Social cohesion includes factors such as social support, including emotional support and sense of belonging, trust, reciprocity and cooperation, and social harmony (Harpham, Grant & Thomas 2002). Personal social cohesion was defined in this study as a combination of respondents' universalistic (harmony) values, subjective perceptions about sense of belonging, levels of generalised reciprocity and social trust, and confidence and hope for the future (optimism).

### Values

Previous Australian research has indicated that values play a role in the relationship between personal social capital and general psychological distress (Berry & Rickwood 2000). Values describe what people believe individuals and society **should** be like (for a review, see Berry et al. 2007). Values are durable, overarching, hierarchically organised belief systems (Hitlin & Piliavin 2004) about what society **should** be like (social values) and about how people **should** behave (personal values). Values are about ideals, and the notion of 'should' is central to the concept. Rokeach (1973) defined values as:

Enduring belief[s] that a specific mode or conduct or end-state of existence is personally or socially preferable.

A set of 10 values appears to be common to all cultures, though cultures vary somewhat in the priority they accord each (Schwarz 1992). The 10 universal values are hedonism, power, achievement, stimulation, self-direction, universalism, benevolence, conformity, tradition and security.

In Australia, values have been shown to predict many areas of social attitudes and behaviours (for example, Braithwaite 1994). Values predict, for example, how people vote and why, which kinds of institutions they trust and their attitudes to contemporary political issues (Braithwaite 1997, 1998a, 1998b). It has been proposed that social values can be reduced to two broad dimensions, 'harmony' and 'security' values (Braithwaite 1997; Feather 1995). Harmony values reflect a belief that people should be open and cooperate with others for the greater good of all, while security values suggest that society should be controlled and people should compete against others to accumulate and protect personal benefits.

Values were measured in this study using the **universalism** domain of Schwarz's 10 universal values. This domain corresponds with Braithwaite's **harmony** dimension and includes nine items, such as 'a world at peace (free of war and conflict)', 'a world of beauty (beauty of nature and the arts)' and 'equality (equal opportunity for all)'. Each item is scored on an asymmetrical seven-point scale from 1='I'm **totally against** this' to 7='I'm



**totally for this’.** Mean scores were calculated by averaging the items ( $M=5.99$ ,  $SD=0.80$ ). Final scores range from 1 to 7, with higher scores representing greater acceptance of the value. With a Cronbach’s alpha ( $\alpha$ ) reliability coefficient of 0.85, the scale demonstrated acceptable internal coherence.

### *Sense of belonging*

Sense of belonging was measured using the belonging subscale of the Interpersonal Support Evaluation List (Cohen et al. 1985). The subscale assesses the degree to which respondents perceive themselves to be a valued member of a social group. It contains 10 items, with each item scored 1=‘yes’ or 0=‘no’. Total summed scores for each subscale range between 0 and 10 with higher scores representing higher levels of sense of belonging. Scores in the present study had a mean of 8.13 with a standard deviation of 2.37. The subscale demonstrated acceptable internal coherence (Cronbach  $\alpha=0.82$ ).

### *Generalised reciprocity*

Generalised reciprocity is evident in a community when people help each other out (i) without expecting help in return or straightaway from the particular person helped, but (ii) in the expectation that, should they require help at some future point, someone will in turn help them.

Examples are giving a stranger a small amount of money for a bus fare or parking voucher (or accepting such help) and neighbours lending each other items or assistance. Subjective individual perceptions of generalised reciprocity were measured using the one-item measure from the World Values Survey (WVS) (Inglehart et al. 1997). The item as used is ‘generally speaking, would you say that, most of the time, people try to be helpful, or are they mostly looking out for themselves?’. The item is scored 1=‘people try to be helpful’, 0=‘people are mostly looking out for themselves’, so that higher scores mean greater sense of generalised reciprocity. Seventy-nine per cent of respondents indicated that they believed most people try to be helpful.

### *Social trust*

Social trust describes the extent to which people trust other people **in general**, in contrast to their trust in (or mistrust of) specific known others (Berry & Rickwood 2000; Berry & Rodgers 2003). Social trust was measured in two ways. Firstly, the Organizational Trust Inventory (OTI) (Cummins & Bromiley 1996), originally developed for measuring trust in organisations, was used. A short-form of the OTI contains 12 items and has been adapted for use in the general population (Berry & Rickwood 2000; Berry & Rodgers 2003). Three four-item subscales tap separate dimensions of trust, defined as believing that most people:

- avoid taking excessive advantage of others
- try to negotiate honestly
- try to honour their commitments.

Each item is scored on a seven-point scale from ‘definitely agree’ to ‘definitely disagree’. Final average scores for each subscale and for the full scale range between 1 and 7 with higher scores indicating higher levels of trust. The subscales and full scale exhibited a high degree of internal consistency with Cronbach’s  $\alpha$  reliability coefficient ranging from 0.77 to 0.90. Trust was also measured using the one-item measure of trust from the WVS (Inglehart et al. 1997). The item as used is ‘generally speaking, would you say that most people can be trusted, or that you can’t be too careful in dealing with people?’. The item is scored 1=‘most people can be trusted’, 0=‘you can’t be too careful’, so that higher scores mean greater trust. Sixty-six per cent of respondents indicated that they believed most people could be trusted.

A detailed analysis of the meaning of trust and appropriate measurement instruments has been reported previously (Berry & Rodgers 2003). This analysis indicated the superiority of the OTI measure of trust, as adapted for use with general population samples. The OTI is a reliable and subtle measure of trust that allows an informative exploration of the relationship between trust and other factors. However, as the study

found that both measures of social trust tapped related constructs, and as the WVS item is very commonly used, it has also been included. One-factor congeneric modelling of the two scales together revealed that all three subscales of the OTI and the WVS item loaded significantly on the latent variable (social trust). Details about this procedure are presented in Section 5. A weighted composite was computed using weightings obtained from the one-factor congeneric model. The composite had a mean of 5.04 and a standard deviation of 0.98. With a Cronbach's  $\alpha$  reliability coefficient of 0.81, the composite demonstrated acceptable internal coherence.

### *Optimism*

Optimism is strongly related to life success in general and (negatively) to common mental health problems such as depression, which inhibit success in life. Dispositional optimism (Scheier, Carver & Bridges 1994) in particular is linked to long-term positive outcomes (Seginer 2000), including health and wellbeing. For a review, see Berry et al. (2007). With its associations with success in life and with general wellbeing, it could be expected that those with higher levels of trait optimism would contribute to and experience higher levels of social cohesion. Optimism was measured in the present study using Scheier, Carver and Bridges' 10-item questionnaire. The 10 items include six items tapping trait optimism (three positively and three negatively worded items), plus four filler items designed to distract the respondent. The four filler items were omitted and the six optimism items interspersed among the trust items.

Consistent with the trust measure, each optimism item is scored on a seven-point scale from 'definitely agree' to 'definitely disagree'. Final average scores for the scale range between 1 and 7 with higher scores indicating higher levels of optimism. The scale exhibited a satisfactory degree of internal consistency with a Cronbach's  $\alpha$  reliability coefficient of 0.78.

### **General psychological distress**

General psychological distress (distress) is a general indicator of the presence of mental health problems. As it is also a predictor of serious physical health problems, such as coronary heart disease (Stansfeld et al. 2002), distress is a good general indicator of health. It is also a convenient indicator: distress emerges acutely and rapidly in response to changes in connectedness to the social environment, such as occur through unemployment and divorce (Butterworth & Berry 2004; Hope, Rodgers & Power 1999), and it is easily and validly detected via short, simple, self-complete screening instruments.

We measured distress using the Kessler 10-item scale (K10), which measures symptoms of non-specific psychological distress (Andrews & Slade 2001). The items included in this measure are presented in Box 1.

#### **Box 1: Kessler 10-item measure of distress**

In the last four weeks, about how often did you feel...

- Tired out for no good reason?
- Nervous?
- So nervous that nothing could calm you down?
- Hopeless?
- Restless or fidgety?
- So restless you could not sit still?
- Depressed?
- That everything was an effort?
- So sad that nothing could cheer you up?
- Worthless?



This is a widely used measure of general psychological distress that has been extensively used in Australian studies. Each item is scored on a five-point scale from 1='none of the time' to 5='all of the time'. Final summed scores have a possible range of 10 to 50 with higher scores indicating higher levels of distress. Scores in the present sample ranged from 10 to 44. Australian mean scores and morbidity rates have been reported for the K10 scale. They are, respectively,  $M=14.2$ ,  $Md=12$ , with 68 per cent of respondents scoring  $<15$  (indicating little or no distress), 29 per cent scoring 16 to 30 (moderate distress) and 3 per cent scoring  $>30$  (severe distress) (Kessler et al. 2002). Consistent with expectations for rural dwellers, scores in the present sample revealed higher mean levels of distress than the Australian norms ( $M=18.19$ ,  $Md=17$ ,  $SD=6.15$ ) and higher morbidity rates (33 per cent, 62 per cent and 5 per cent respectively). The scale exhibited a satisfactory degree of internal consistency (Cronbach  $\alpha=0.88$ ).

### **Sociodemographic data**

Social capital is related to the sociodemographic characteristics of individuals and of the neighbourhoods within which they live, with poorer neighbourhoods evidencing lower levels of social capital (Drukker et al. 2003). Participants reported their sex, age, Indigenous Australian status, years of education, responsibility for dependent persons (under and over 18 years), being in paid work at least six hours a week, living alone, and having a government benefit health care card. This is a proxy for very low income because health care cards are strictly means tested in Australia.

## **2.7 Analytic methods**

### **Measuring community participation**

The development and validation of the Australian Community Participation Questionnaire is summarised in the article reproduced in Appendix C. More detailed information about the analytic techniques used—exploratory factor analysis and one-factor congeneric modelling—is presented here. One-factor congeneric modelling was also used in the present study in developing the structural model reported in Section 5.

#### *Factor analytic techniques*

The purpose of exploratory factor analysis is to explore the underlying structure of the data, while that of one-factor congeneric modelling is to refine the structure and test the validity of factors. These data met the conditions for exploratory factor analysis:

- the study was purpose-designed for exploratory factor analysis
- the variables were intuitively related
- the data set was factorable
- the sample size was 'excellent' (Comrey & Lee 1992)
- sampling statistics were acceptable (Bartlett's test of sphericity  $p<0.0001$ , Kaiser-Meyer-Olkin statistic= $0.89$ ).

Exploratory factor analysis is sensitive to outlying cases, which were deleted as described above. There were no outlying variables. Similarity across solutions is an indicator of factor structure stability, so we compared four approaches: principal axis factoring and maximum likelihood factoring each in combination with varimax and oblimin rotations, with Kaiser normalisation. Maximum likelihood factoring and oblimin rotation were theoretically preferable as they accommodate non-normal distributions and correlated solutions respectively.

The principle criteria for evaluating the factor solutions were:

- meaningfulness and interpretability (factors that made sense and were consistent with the literature)
- scientific usefulness

- parsimony
- fewer than 5 per cent non-redundant residuals.

Factor adequacy was the most important criterion for determining the appropriate number of factors and, therefore, for evaluating parsimony. It was assessed on theoretical considerations and factor stability (factors with at least three items, squared multiple correlations  $>0.70$ , item loadings  $>0.45$ , and factor and item structures common to several solutions). The magnitudes of item loadings indicate factor stability and help interpret factors, with loadings  $>0.80$  suggesting defining, or 'marker' variables.

The data also met the assumptions for one-factor congeneric modelling, which are similar to the assumptions for exploratory factor analysis. We used an asymptotic distribution free estimation procedure, which does not assume normality of distribution, because some of our data were skewed. To accommodate the requirements of structural modelling, variables with bimodal distributions were dichotomised. Based on mean-split, scores were recorded as '1' ('engaging') or '0' ('not engaging') in an activity. We judged model fit based on a holistic consideration of the chi-square statistic, parameter estimates, item reliabilities, scale reliabilities, and goodness-of-fit indices (absolute fit, incremental fit, and parsimony indices). Detailed information is presented in Section 5.

### **Relationships among predictor and outcome variables**

Relationships between independent variables were assessed in the first instance by examining bivariate unadjusted correlations, and then partial correlations adjusted for the other variables and sociodemographic characteristics derived from multiple regression analyses with distress as the dependent variable. The results of analyses of participation variables are presented in Section 3, while the analyses examining personal social cohesion appear in Sections 4 and 5.

Hierarchical linear regression analyses were employed to evaluate the independent relationship between each independent (predictor) variable in explaining variance in distress, starting with the sociodemographic control variables, then adding each of the predictor variables, one at a time in the order suggested by social capital theory. Changes in standardised beta values were examined to assess the degree of mediation, if any, from step-to-step in the analysis.

One-factor congeneric modelling was used to examine the structures of sociodemographic disadvantage, community participation and personal social cohesion. Structural equations modelling was used to examine the relationships between these concepts and general psychological distress. The results of these models are presented in Section 5.

## 3 Community participation

### Section summary

This section describes the measures of community participation used in this study and how they were derived. Five indices of participation were used: an index of breadth of participation and four indices of perceptions about participating. These were perceptions about participating too much and too little, and subjective enjoyment and lack of enjoyment of participation. Descriptive statistics are presented together with sex differences for each of the indices.

### 3.1 Breadth of participation

Breadth of participation was measured using an index derived from the Australian Community Participation Questionnaire (Berry, Rodgers & Dear 2007). Details of the development and validation of the questionnaire, and of the items included in it, are in the appendixes to this report. In overview, the questionnaire contains 67 items tapping 14 separate types of participation:

- contact with immediate household
- contact with extended family
- contact with friends
- contact with neighbours
- social contact with workmates
- organised community activities
- giving money to charity
- voluntary sector activity
- adult learning
- religious observance
- active interest in current affairs
- expressing opinions publicly
- community activism
- political protest.

Community participation is typically characterised by personal involvement that reflects commitment, initiative and effort. Consistent with the findings of another recent Australian general population study of participation and health, levels of participation varied by sex and also by type of participation (Baum et al. 2000). Mean scores and standard deviations for 14 types of community participation based on the questionnaire are presented in Table 1.

### Women and men

There were statistically significant differences in the frequency of participation of women compared with men. Women reported more frequent participation than men in five domains, including contact with extended family and friends, ongoing informal learning, religious observance, and giving money to charity. While there were no significant differences in levels of participation in the other domains, there were interesting trends.

**Table 1: Mean scores (and 95% confidence intervals) for 14 domains of community participation, zero-order and partial correlations with general psychological distress (K10), and standardised beta coefficients**

Domains of participation	Mean score (95% confidence interval)			Correlations		Standardised beta	
	Female	Male	Total	Pearson's <i>r</i>	Partial <i>r</i>	Unadjusted	Adjusted <sup>(a)</sup>
Contact with immediate household <sup>(b)</sup>	5.55 (5.37–5.73)	5.36 (5.16–5.56)	5.46 (5.33–5.59)	–0.05*	–0.04	–0.07*	–0.07*
Contact with extended family <sup>(b)</sup>	4.22 (4.11–4.34)	3.80 (3.68–3.92)	4.02 (3.94–4.11)	–0.16***	–0.08**	–0.07*	–0.07*
Contact with friends <sup>(b)</sup>	4.60 (4.48–4.72)	4.12 (4.01–4.24)	4.37 (4.29–4.46)	–0.20***	–0.07*	–0.12***	–0.13***
Contact with neighbours <sup>(b)</sup>	3.74 (3.60–3.88)	3.61 (3.47–3.75)	3.68 (3.58–3.78)	–0.18***	–0.11***	ns	–0.08**
Social contact with workmates	2.15 (2.01–2.28)	2.30 (2.16–2.44)	2.22 (2.12–2.32)	–0.06*	–0.06	ns	ns
Organised community activities <sup>(b)</sup>	3.40 (3.21–3.58)	3.21 (3.03–3.40)	3.31 (3.18–3.44)	–0.13***	–0.07*	–0.10**	–0.09**
Giving money to charity	4.59 (4.47–4.70)	4.29 (4.17–4.41)	4.44 (4.36–4.53)	–0.11***	–0.03	–0.07*	ns
Voluntary sector activity	2.71 (2.55–2.87)	2.47 (2.31–2.63)	2.60 (2.48–2.71)	–0.07*	0.00	ns	ns
Adult learning	2.27 (2.15–2.39)	1.78 (1.67–1.88)	2.03 (1.95–2.11)	–0.04	–0.03	ns	ns
Religious observance <sup>(b)</sup>	2.27 (2.12–2.42)	1.79 (1.66–1.91)	2.04 (1.94–2.14)	–0.11***	–0.06	–0.07*	–0.06*
Active interest in current affairs <sup>(b)</sup>	5.46 (5.35–5.57)	5.55 (5.45–5.65)	5.51 (5.43–5.58)	–0.09**	–0.06	–0.11***	–0.07*
Expressing opinions publicly	1.79 (1.69–1.89)	1.82 (1.71–1.93)	1.80 (1.73–1.87)	0.03	0.04	0.10**	0.12**
Community activism	1.33 (1.27–1.39)	1.44 (1.36–1.51)	1.38 (1.34–1.43)	–0.01	–0.02	ns	ns
Political protest	1.65 (1.56–1.73)	1.75 (1.65–1.85)	1.70 (1.63–1.76)	0.06*	0.09**	0.08*	0.08*

(a) Adjusted for sex, age, health care card, Indigenous status, years of education, paid work, living alone, and dependents under and over 18 years.

(b) Fig 7.

Notes: **Bold typeface** for mean scores indicates score is higher than that of opposite sex at  $p$ -value < 0.05.

For correlations and standardised beta coefficients: \* =  $p$  < 0.05; \*\* =  $p$  < 0.01; \*\*\* =  $p$  < 0.001.

'ns' = not significant

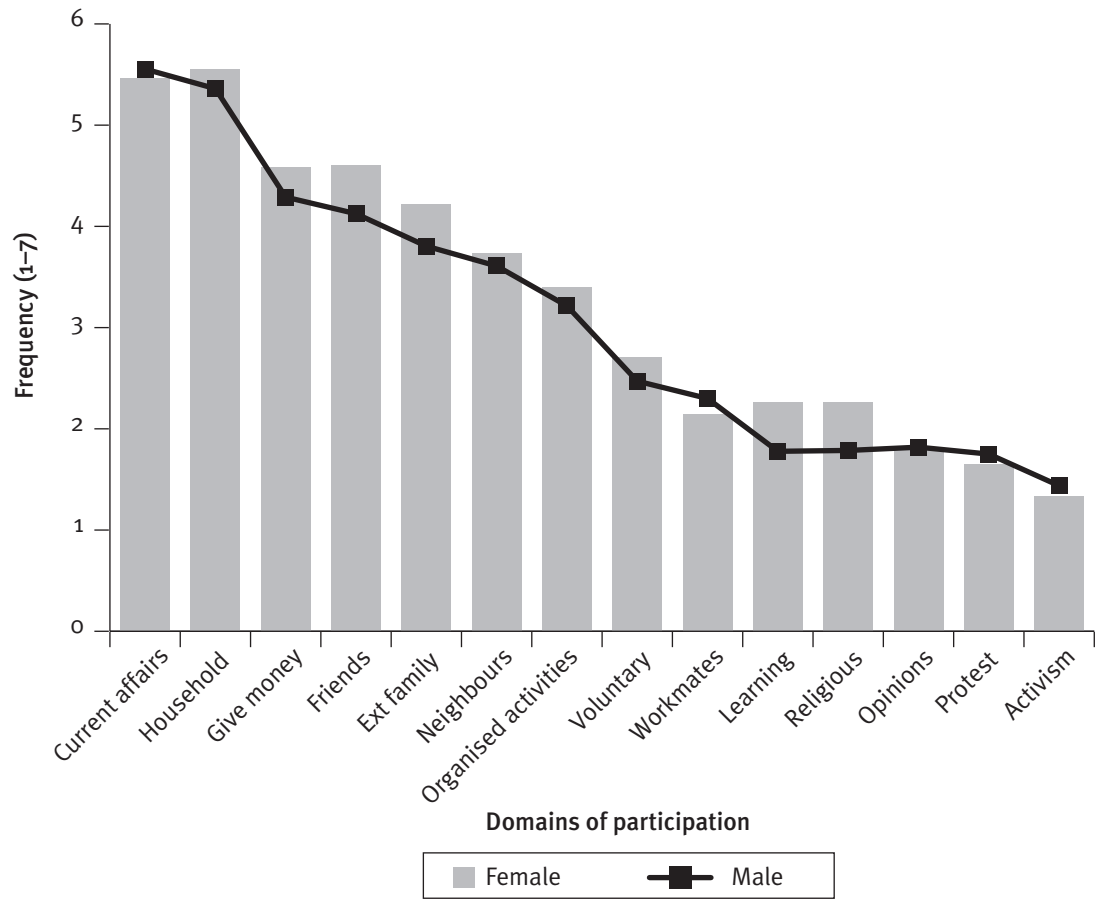
Source: Berry, Rodgers & Dear 2007.

Women tended towards more contact with household members and with neighbours, and towards more organised community activities and voluntary sector activity, while men tended towards more social contact with workmates. Men also tended towards more active interest in current affairs, expressing opinions publicly, community activism and political action. These trends would be worth following up in future studies, because they suggest not only different levels of participation between the sexes, but also different broad areas of participation.

From very common to very uncommon ways of participating in the community

Mean scores for women and for men for each type of community participation are presented in Figure 2.

Figure 2: Mean frequency of participation in the 14 types of participation by sex



Note: For the full list of domains of participation, see Section 3.1.

Common and moderately common types of participation

Based on mean scores, the most frequently undertaken forms of community participation were, in order, taking an active interest in current affairs, having contact with household members and with friends, and giving money. These were followed by having contact with extended family and also with neighbours, and taking part in organised community activities. Of these common and moderately common forms of community participation, women reported significantly more contact with extended family and friends than did men.

Less common and rare types of participation

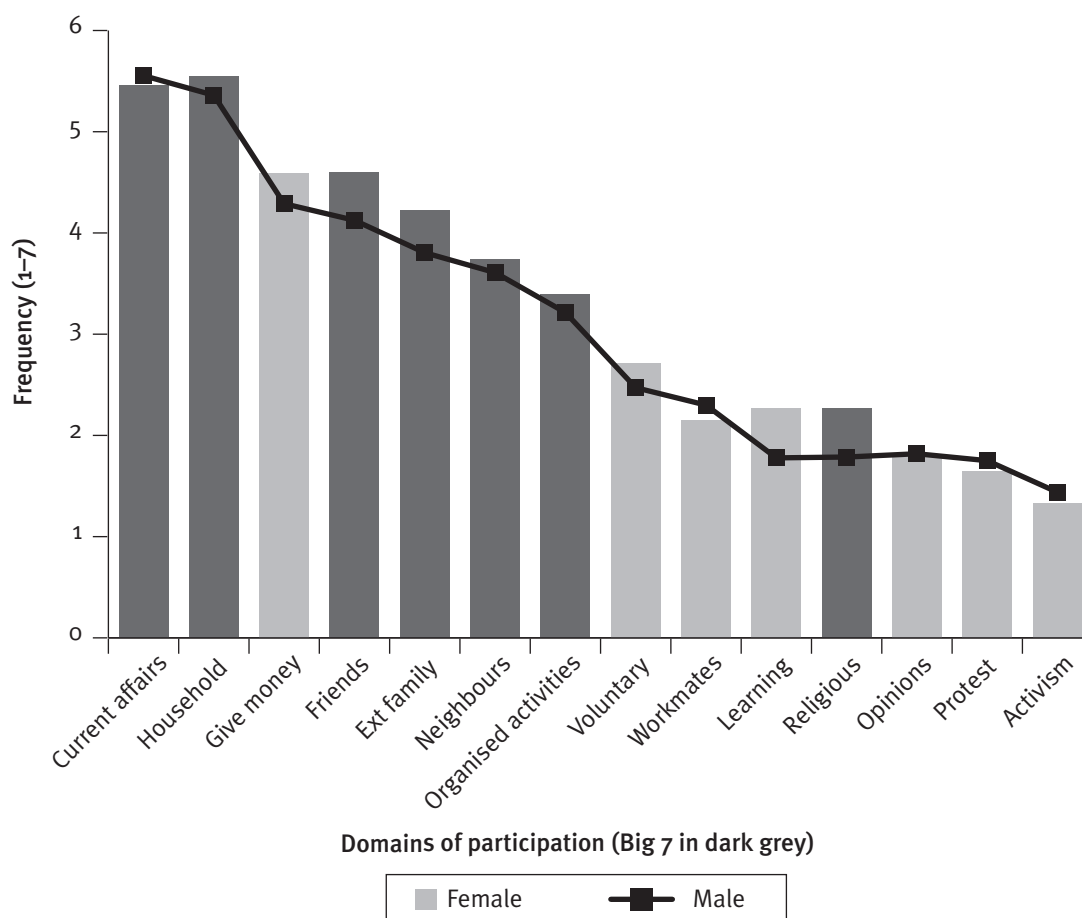
On average, respondents reported much less frequent involvement in voluntary sector activity, social contact with workmates, religious observance and ongoing informal learning. Of these less common forms

of community participation, women reported significantly more frequent ongoing informal learning, religious observance and voluntary sector activity than did men. Expressing opinions publicly, community activism and political action were all rare forms of community participation. Of these rare forms of participation, men reported significantly higher levels of community activism than women.

### Breadth of participation

Seven types of participation, called the Big 7, have been found to be independently related to lower levels of general psychological distress (Berry, Rodgers & Dear 2007). These are contact with immediate household, extended family, friends, and neighbours; organised community activities; religious observance; and active interest in current affairs (see Figure 3). These types of participation are, for the most part, consistent with informal social connectedness (see Figure 1), with the findings consistent with literature finding links between informal connectedness and better health but not between civic engagement and political participation and better health (Yip et al. 2007).

Figure 3: Big 7 types of community participation

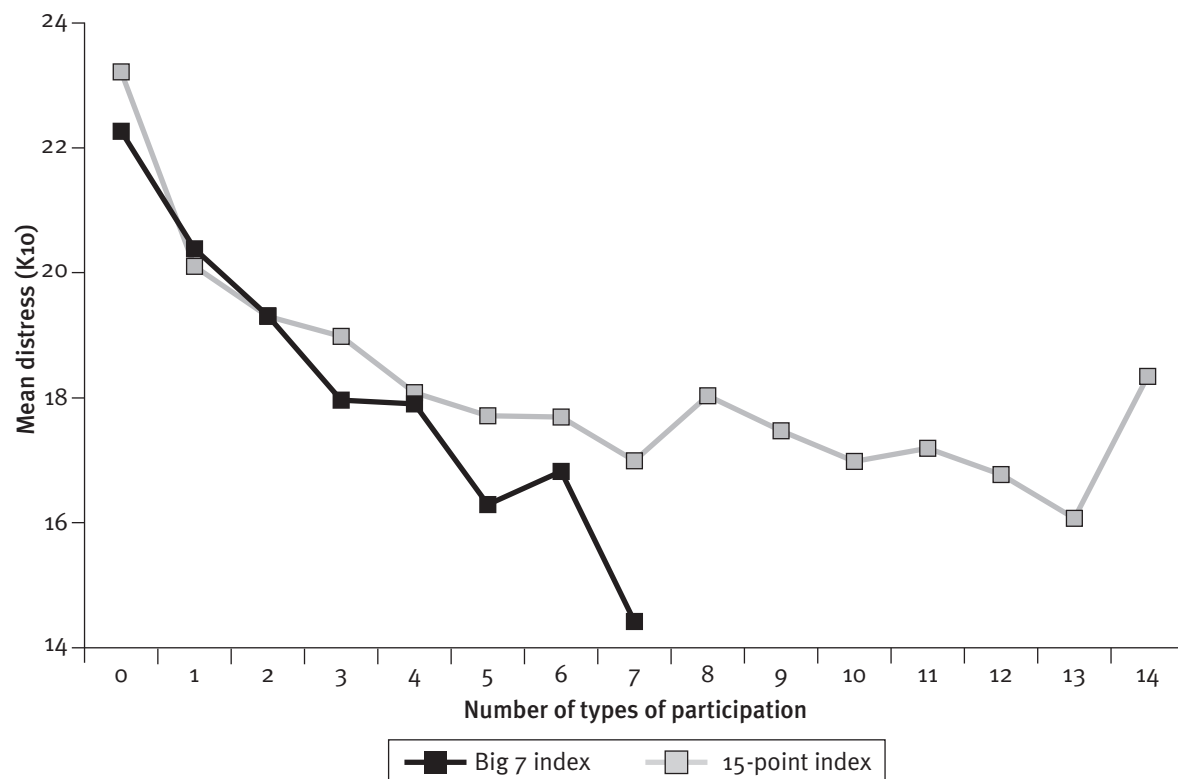


Note: For the full list of domains of participation, see Section 3.1.

An index of breadth of participation was derived by splitting the sample about the mean for each of the seven types of participation associated with fewer symptoms of general psychological distress (details are given in Berry 2008, see Appendix C).

Each respondent was assigned a score of 1 (on or above the mean) or 0 (below the mean) for each of these seven types of participation. Scores were summed to give an 8-point index with a range of 0 to 7 and a mean of 3.60 (SD=1.61). There was a striking linear relationship between increasing breadth of participation and decreasing levels of general psychological distress, but only when combining the Big 7 types of participation. When combining all 14 types, the relationship with distress was significantly weaker, and non-linear (see Figure 4). As this report is concerned with the relationship between participation and distress, the Big 7 index has been used in all subsequent analyses.

**Figure 4:** Estimated marginal means for general psychological distress for total number of Big 7 types of participation, compared with all types, controlling for sociodemographic factors



Note: Mean=18.18, Standard deviation=6.15.

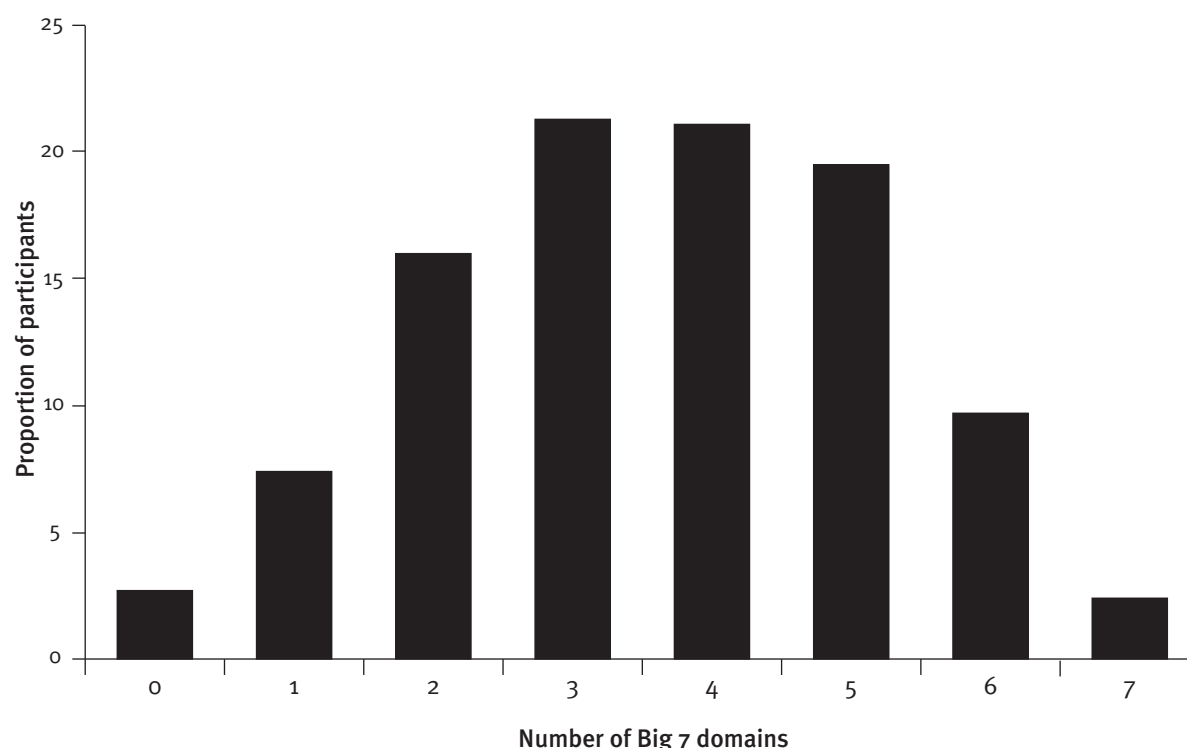
Source: Berry, Rodgers & Dear 2007.

### Frequency of community participation

The distribution of scores for the Big 7 index of participation is at Figure 5. Very few people were non-participants—most people participated in at least one and some in up to all seven of the Big 7 domains. The distribution of scores was normal.



Figure 5: Proportion participating in each level of the Big 7 domains of community participation



Descriptive statistics for the participation index are presented at Table 2. While differences in mean scores were not large, they indicated a clear trend towards women participating at higher levels and across a wider variety of types of participation than men. Women also enjoyed participating slightly more than did men.

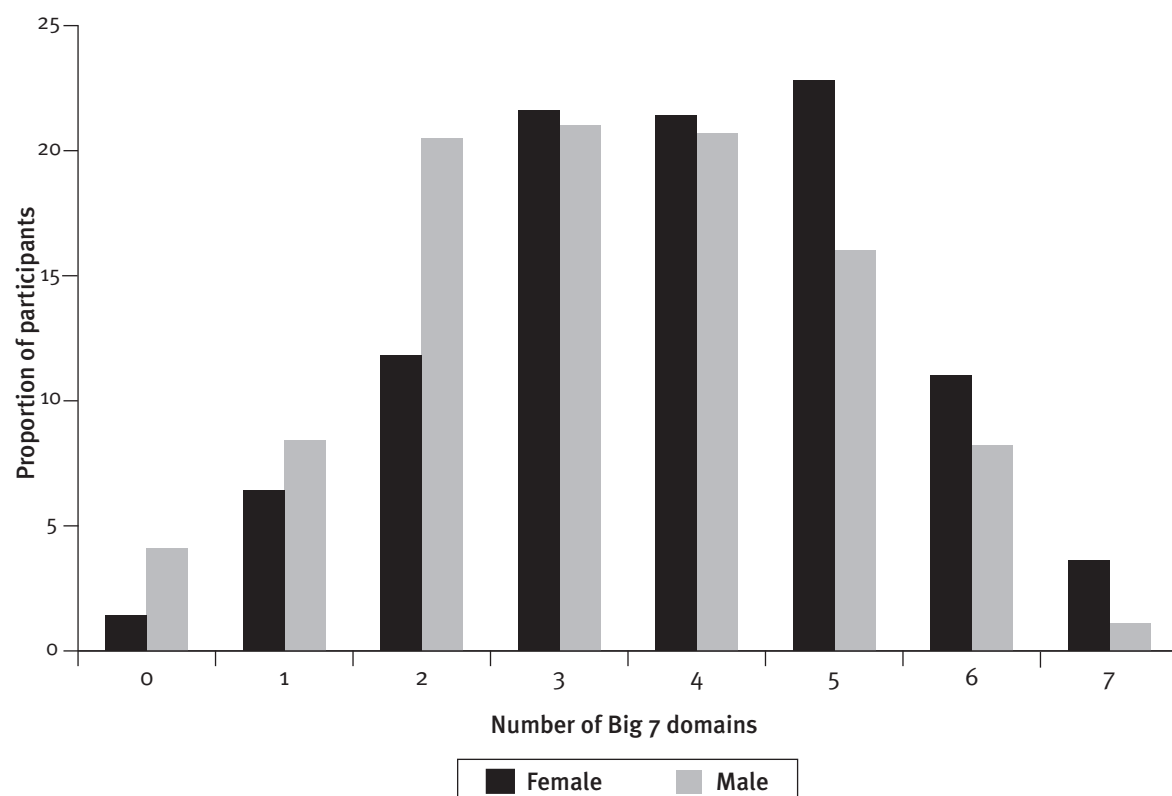
Table 2: Mean (and standard deviation) of participation breadth, sufficiency and enjoyment indices, by sex

	All	Sex	
		Female	Male
Breadth of participation	3.60 (1.61)	3.86 (1.57)	3.32 (1.60)***
Too much participation	0.24 (0.54)	0.24 (0.54)	0.24 (0.55)
Too little participation	2.31 (1.50)	2.38 (1.45)	2.22 (1.55)
Enjoyable participation	2.42 (1.80)	2.53 (1.81)	2.30 (1.77)*
Unenjoyable participation	0.15 (0.48)	0.14 (0.50)	0.15 (0.45)

Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

Figure 6 shows the distribution of the breadth of participation in the Big 7 domains by sex. The sex difference is particularly apparent at the extreme ends of the index. Men are more than twice as likely as women to be complete non-participants and women are more than twice as likely as men to participate in all seven domains. The same trend was evident in the less extreme scores. Men were more likely to participate in just one or two of the Big 7 domains than were women, and women were more likely than men to participate in five or six domains than were men.

Figure 6: Proportion participating in each level of the Big 7 domains of community participation, by sex



### 3.2 Perceptions about participation

The most similar construct to community participation and personal social cohesion that has been extensively empirically and psychometrically investigated is social support. Its protective benefits have been related not so much to the objective amount of support available to an individual, but to that person's subjective perceptions of the adequacy, availability and positive nature of such support (Cohen et al. 1985). In a similar vein, it may be that subjective perceptions of the adequacy and positive nature (or otherwise) of community participation are equally, or more predictive of levels of participation and of mental health than simple frequency of participation, and that these qualitative attributes of participation are linked to personal social cohesion, perhaps more strongly than simple frequency of participation. Implications for social policy and program design might include consideration of subjective experiences of participation, and what is likely to encourage or discourage participation, alongside consideration of levels of participation. Of particular interest would be empirical input with respect to whether, from a policy perspective, it is perhaps desirable to try to increase levels of participation generally, or whether it might be preferable to try to encourage certain kinds or amounts of participation tailored to the specific characteristics and needs of different client/target groups, or some combination of both strategies.

### 3.3 Participating too much or too little

#### Constructing indices of too much and too little participation

Perceptions about taking part too much or too little in the 14 different types of community participation were measured. Respondents were asked whether the amount of time they spent engaging in each type of participation was too much or too little. Items were scored on a five-point response format where 1='much too much', 2='a bit too much', 3='about right', 4='a bit too little', and 5='much too little'. There was no 'does not apply to me' option in the response format. The measure was designed to tap subjective perceptions of participating too much or too little, irrespective of reported breadth of participation. Thus, a respondent could report 'rarely or never' getting involved in organised community activities, and also report that the amount of time spent doing this was 'about right'.

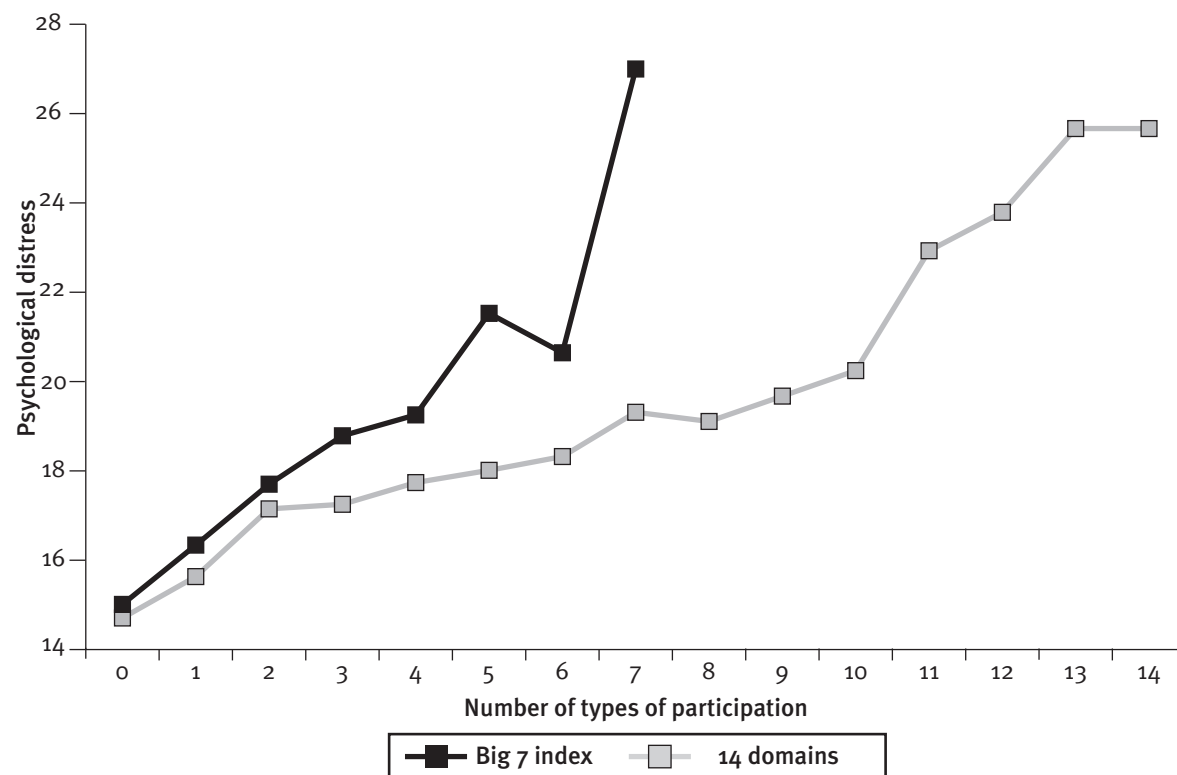
The procedure was the same for both indices. The procedure used to produce the index of too little participation is presented to illustrate the process. Responses for each type of participation were recoded to scores ranging from 0 to 2 (see Table 3). Mean scores were calculated for each type of participation (see Appendix F) and participants were then assigned a score of 1 (on or above the mean; participating too little) or 0 (below the mean; not participating too little) for each type of participation.

**Table 3: Recoding time into too much participation and too little participation**

Original coding	Too much participation	Too little participation
1=much too much	2	0
2=too much	1	0
3=about right	0	0
4=too little	0	1
5=much too little	0	2

Following the rationale developed for the Big 7 index of breadth of community participation, two indices were constructed for too little participation. For the first index, respondents' scores for feeling they were doing too little of all 14 types of participation were summed, giving a 15-point index ranging from 0 to 14. For the second index, only scores for participating too little in the Big 7 types were summed, giving a score ranging from 0 to 7. This same procedure was repeated to create two indices of engaging in too much participation. Figure 7 shows the relationship between distress and too little participation contrasting Big 7 and the 14 domains indices.

Figure 7: Mean of psychological distress for number of Big 7 domains of participation compared to all types of participation for too little participation



The index based on the Big 7 types of participation produced a stronger relationship with distress than did the index based on all 14 types of participation. A similar, though weaker, relationship between distress and too much participation was also found. Thus, consistent with the Big 7 index of breadth of participation, indices of participating too much and too little based on the Big 7 types of participation were used in all subsequent analyses.

### Too much and too little participation: descriptive and univariate analyses

The frequency distributions of too much participation and too little participation indices are presented at Figure 8. The distribution of the scores for too much participation was highly positively skewed, with the large majority of participants reporting that they did not participate too much in any domain of participation. A small minority of participants reported that they spent too much time participating in one domain and even fewer reported too much participation in two domains. In contrast, the distribution of the too little participation index was close to normal. Most participants reported spending too little time participating in at least one of the domains, with some reporting spending too little time participating in five of the seven domains. Overall, participants were much more likely to feel they were spending too little time, rather than too much time, participating.

Figure 8: Frequency of scores of too much and too little participation

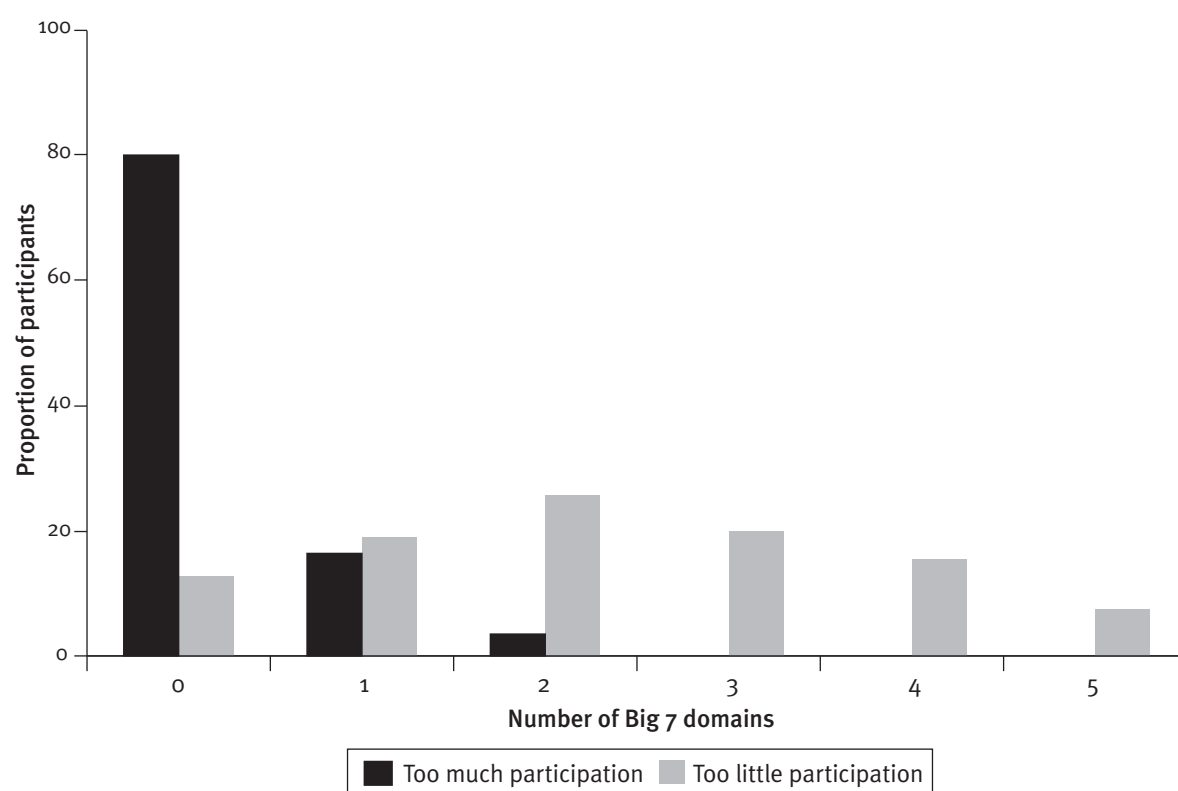
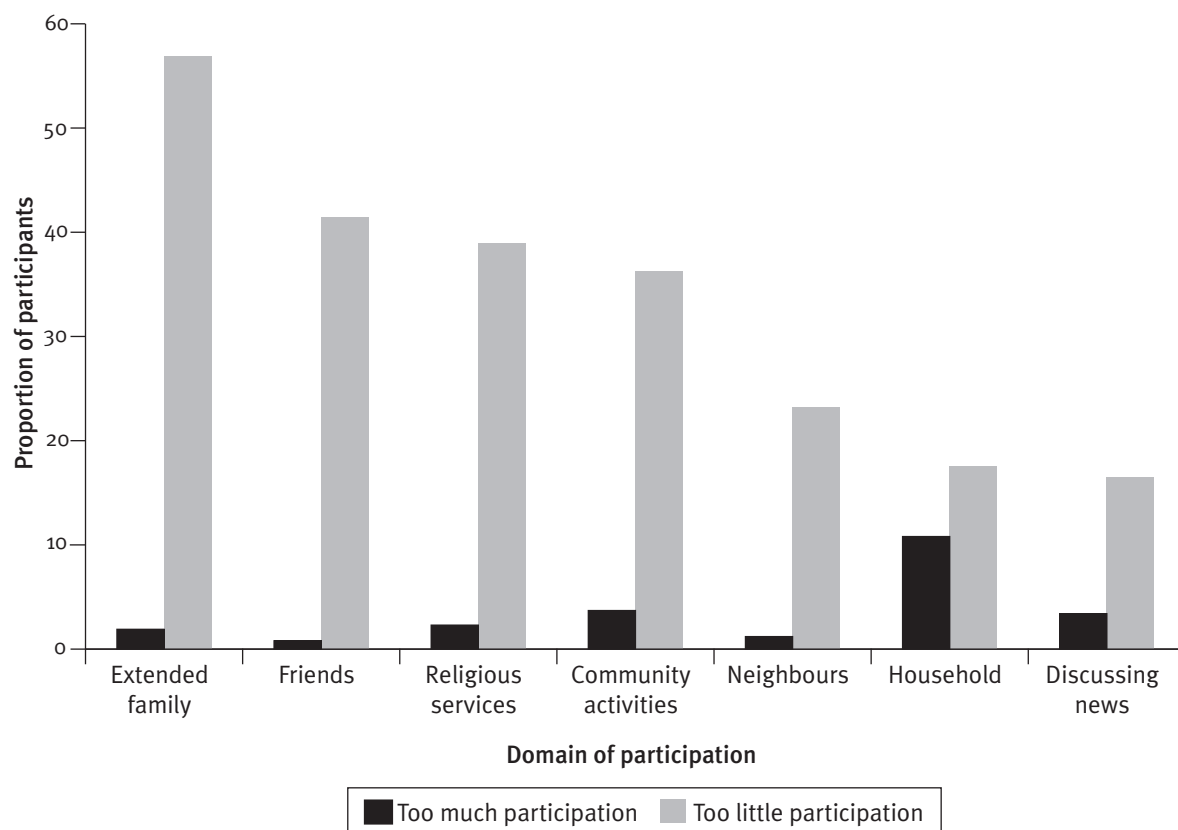


Figure 9 shows the proportion of participants who felt they participated too much and too little by type of participation. Almost half of the participants who reported too much participation, men and women equally, said they were spending too much time with members of their immediate household. Few participants reported spending too much time engaging in the other six types of participation.

There was a clear hierarchy of domains in which participants felt that they were participating too little. Participants most commonly reported spending too little time with extended family and more than a third divulged that they spent too little time with friends, at religious services and in community activities. Slightly fewer participants reported not spending enough time with their neighbours, with those in the immediate household and discussing news. Mean scores and standard deviations for the too much and too little indices are at Table 2. There were no overall sex differences in mean perceptions scores about too much or too little time spent participating.

Figure 9: Frequency distributions of scores for too much and too little participation by type of participation



### 3.4 Enjoying or not enjoying participation

#### Constructing indices of enjoying or not enjoying participation

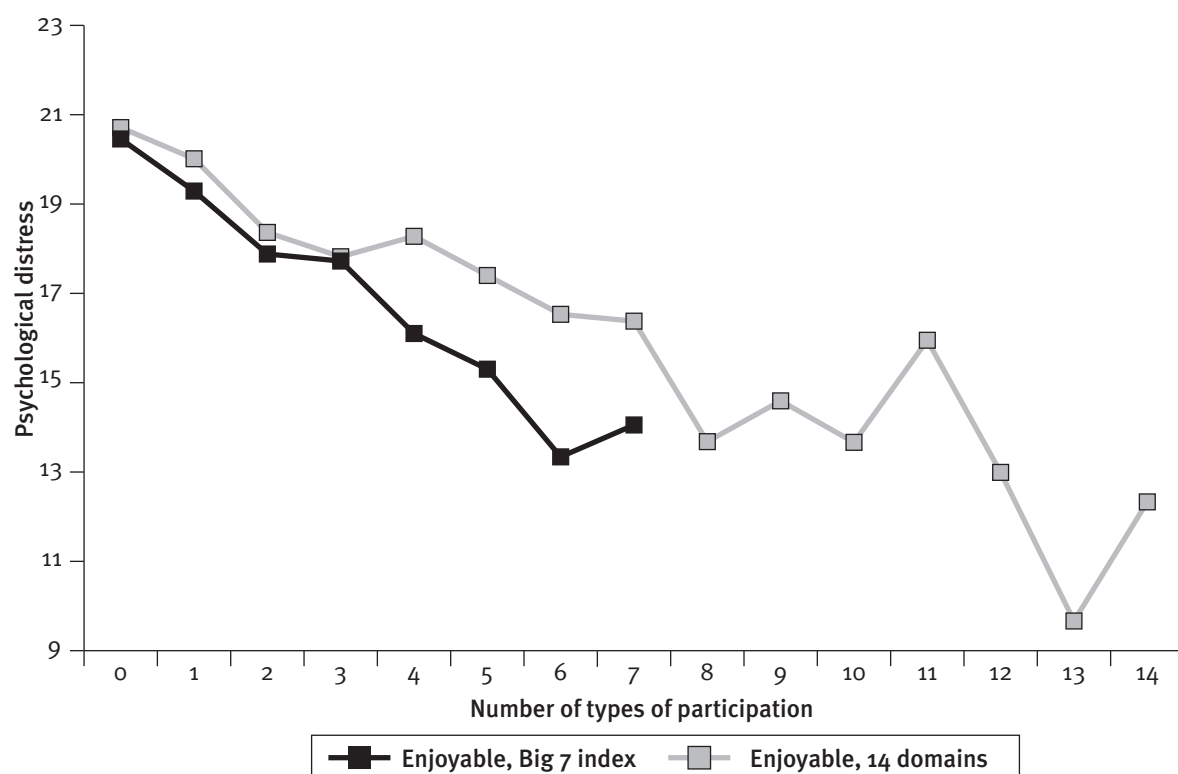
Perceptions about enjoying or not enjoying different types of community participation were measured by items asking respondents about 'how much they enjoy' the time spent in each type of participation. Items were scored on a six-point response format where 1='very enjoyable', 2='enjoyable', 3='OK', 4='unenjoyable', 5='very unenjoyable' and 6='does not apply to me'. In contrast to the too much and too little items it was appropriate to include a 'does not apply to me' option for those who did not participate in particular types of participation.

The same procedure was used to create indices of enjoying and not enjoying community participation as was used to construct the too much and too little indices. The recoding into enjoyable and unenjoyable is at Table 4 and mean scores for each domain of participation are presented in Appendix F. Participants were attributed a score of 1 (on or above the mean) or 0 (below the mean) for enjoying and not enjoying participating in each type of participation. These scores were summed twice to create two indices each for enjoying or not enjoying participating—first including all 14 domains of participation and then including only the Big 7 domains of participation.

**Table 4: Recoding enjoyment into enjoyable participation and unenjoyable participation**

Original coding	Enjoyable participation	Unenjoyable participation
1=very enjoyable	2	0
2=enjoyable	1	0
3=OK	0	0
4=unenjoyable	0	1
5=very unenjoyable	0	2
6=does not apply to me	0	0

Figure 10 shows the relationship between distress and enjoyable participation contrasting the Big 7 index and the index including all domains of participation.

**Figure 10: Mean of psychological distress for number of Big 7 domains of participation compared to all types of participation for enjoyable participation**


As Figure 10 shows, the Big 7 index of enjoying participating produced a linear and stronger relationship with distress than did the index based on all 14 types of participation. The relationship between enjoying participation and distress followed the same pattern as the relationship between breadth of participation and distress. Participants who reported enjoying their community participation reported lower levels of general psychological distress than did those who reported less enjoyment. The association between not enjoying participation and distress was weaker and less clear but followed a similar trend. Indices of enjoying and not enjoying participation were based on the Big 7 types of participation and were used in all subsequent analyses.



Enjoying and not enjoying participating: descriptive and univariate analyses

Frequency distributions of enjoyable participation and unenjoyable participation are at Figure 11. As for too much participation, not enjoying time spent participating was highly positively skewed. Most participants reported that there were no domains of participations they found unenjoyable. Less than 10 per cent of participants said they found just one domain unenjoyable and very few reported that they were not enjoying two domains of participation. In contrast, few participants reported that they did not find any types of participation enjoyable. Most participants reported enjoying at least one type of participation, with some reporting enjoying participating in up to six types. Women were slightly more likely than men to report enjoying participating (Table 2).

Figure 11: Frequency of enjoyable and unenjoyable participation

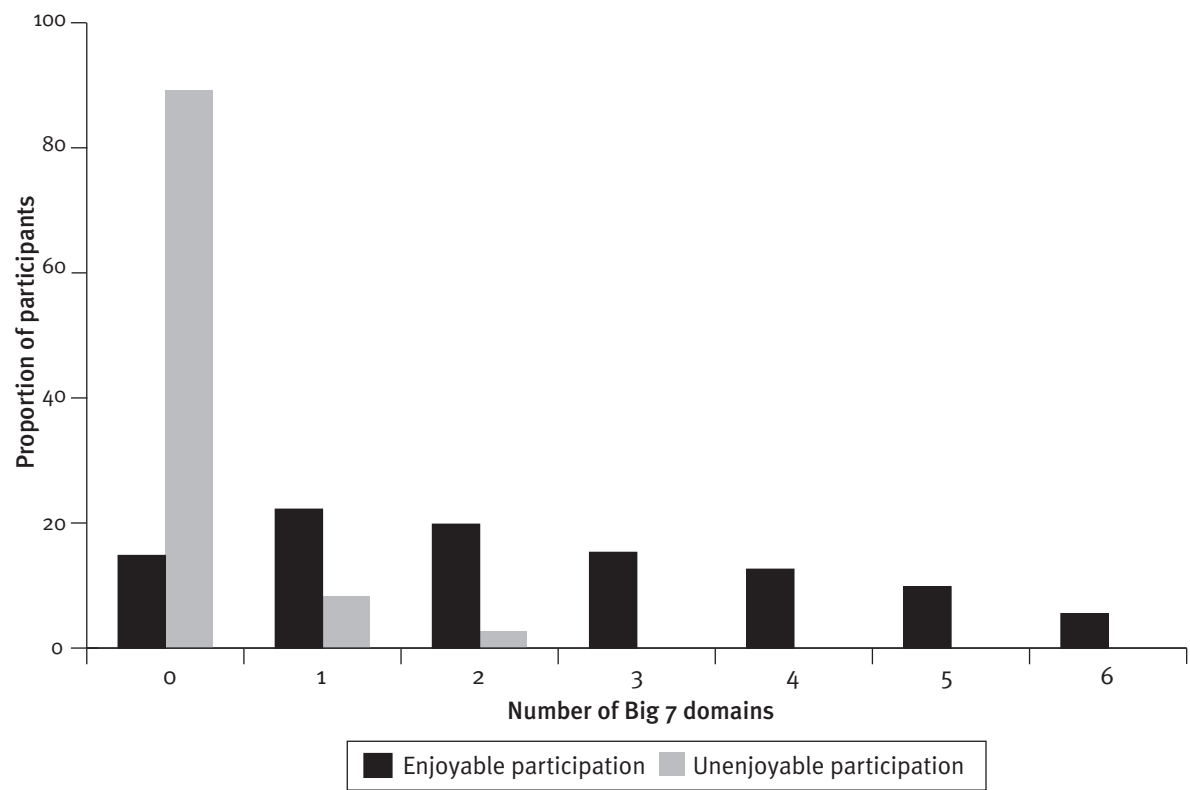
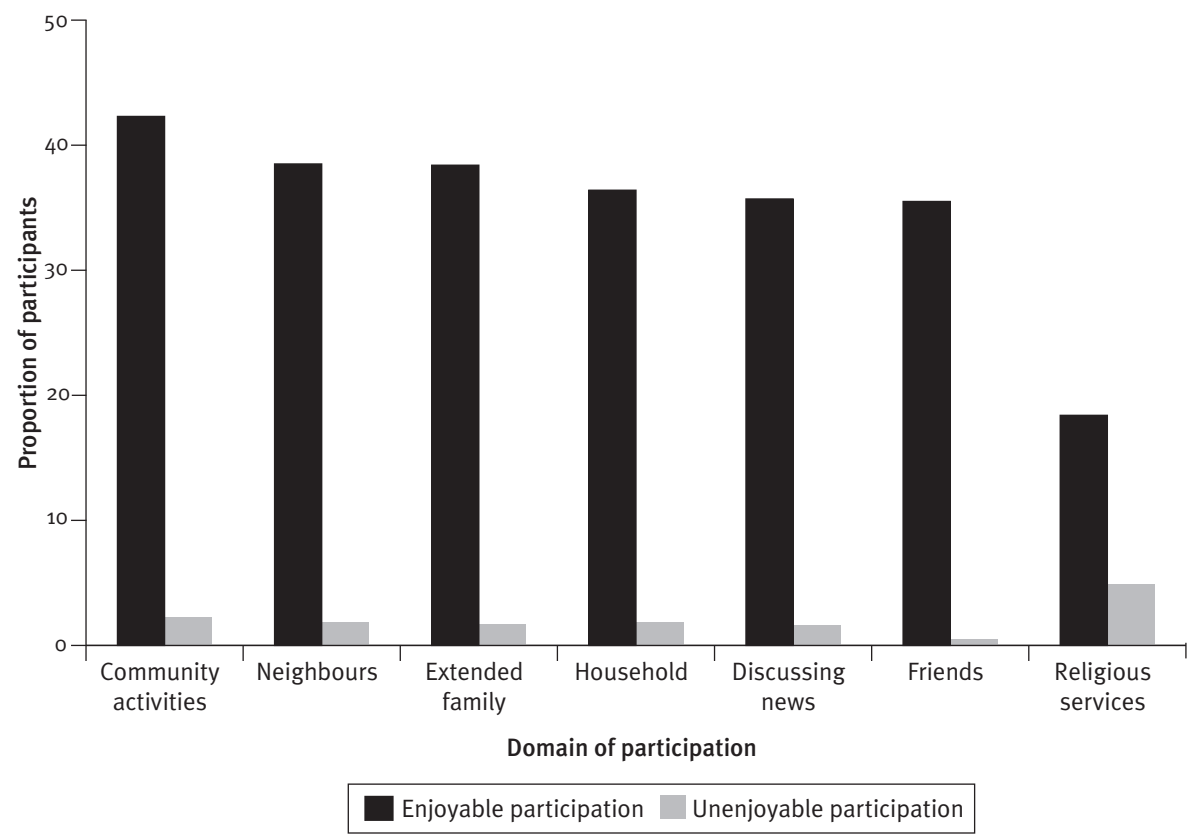


Figure 12 shows the proportion of participants reporting each domain of participation as enjoyable or unenjoyable. Of the small number of participants who reported not enjoying participating, they were most likely to be not enjoying participating in religious services—though this was still less than 5 per cent of the sample. With the exception of religious observance, the proportion of participants enjoying each domain was roughly equal (35 to 40 per cent). There was no clear hierarchy for enjoying participation.

Figure 12: Frequency of enjoyable and unenjoyable participation by domain of participation



3.5 Breadth of participation and its relationship to perceptions about participation

Pearson Product Moment Correlation coefficients between breadth of participation and the four indices of perceptions about participation were examined. The correlation matrix is presented at Table 5. The largest correlation was between breadth of participation and enjoying participation, a moderate positive correlation, such that those who participated more broadly were also more likely to report enjoying participating. All other correlations were significant but weak. A notable exception was that breadth of participation was not bivariately related to perceptions about too much participation, such that perceptions about participating too much were not related to the number of types of participation in which respondents engaged. Non-significant, and small to moderate correlations suggest that the indices are measuring separate constructs and that they are not collinear. Their contributions as part of an underlying, or latent, concept of community participation are examined in Section 5.

**Table 5: Correlation matrix of community participation indices**

	2	3	4	5
1 Breadth of participation	−0.06	−0.24***	0.40***	−0.09***
2 Too much participation	—	0.01	−0.14***	0.08*
3 Too little participation		—	−0.15***	0.07*
4 Enjoyable participation			—	−0.21***
5 Unenjoyable participation				—

Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

Perceptions of participating too much were not correlated with perceptions about participating too little, suggesting these measures were independent and measuring different concepts—participants could feel that they were participating too much in some domains at the same time as considering that they were not participating enough in others. However, perceptions about enjoying and not enjoying participating were correlated. Those who particularly enjoyed some kinds of participation were less likely than those who did not to report that there were types of participation that they particularly did not enjoy. Enjoying and not enjoying participation in the Big 7 domains were weakly associated, such that those who participated more broadly in the community were more likely to enjoy participating and less likely not to enjoy it.



## 4 Participation, personal social cohesion and psychological distress

### Section summary

This section describes the five components of personal social cohesion included in this study—universalistic values, sense of belonging, generalised reciprocity, social trust and optimism—and provides descriptive information about each component. Bivariate relationships among the components are investigated. Bivariate associations among components of community participation (breadth of participation and perceptions about participating), personal social cohesion and general psychological distress are then examined. Finally, multivariate relationships among the components of community participation, personal social cohesion and general psychological distress are investigated.

### 4.1 Personal social cohesion

Personal social cohesion is defined in this study as encompassing universalistic values, a sense of belonging, generalised reciprocity, social trust and optimism. Details about the measures used are given in Section 2. Table 6 presents descriptive statistics for the different components of cohesion. Two measures of trust have been used—the Organizational Trust Inventory, which is a multi-item scale and the single-item on trust from the World Values Survey.

**Table 6: Mean scores (and standard deviations) for components of personal social cohesion**

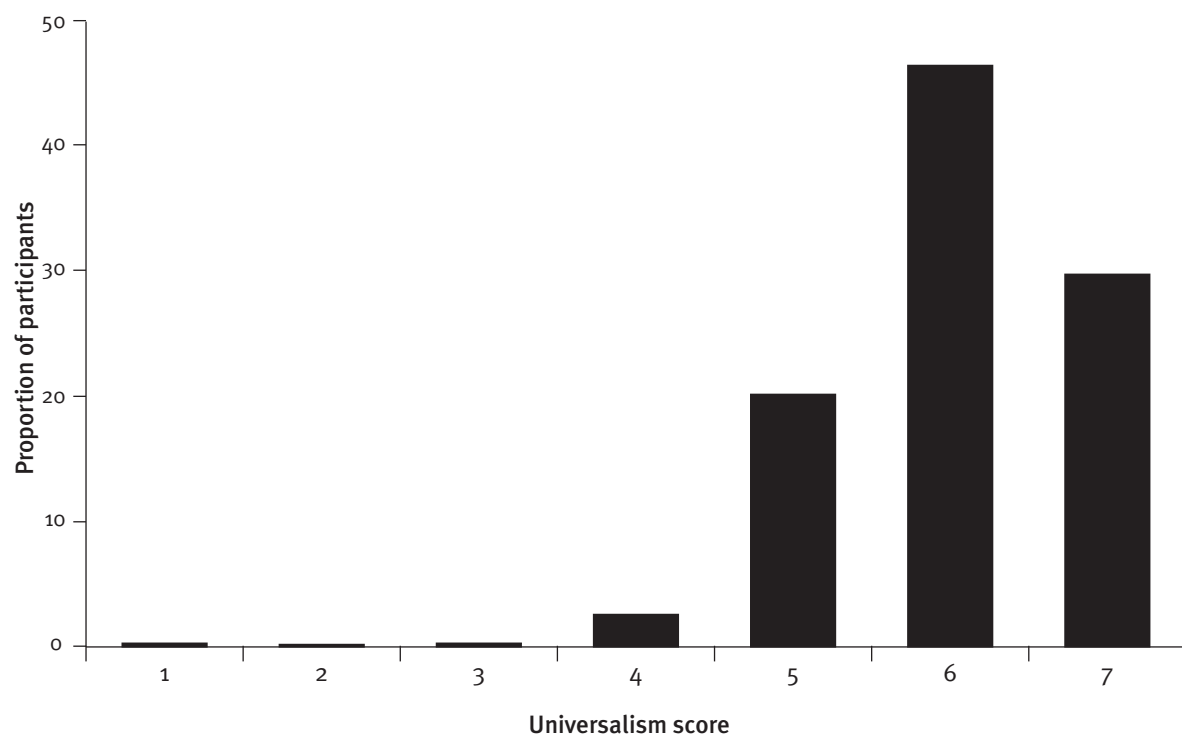
	Range	All	Sex	
			Female	Male
Universalism	0–7	5.99 (0.80)	6.10 (0.72)	5.87 (0.86)***
Belonging	0–10	8.13 (2.37)	8.24 (2.36)	8.02 (2.38)
Reciprocity	0–1	0.79 (0.41)	0.83 (0.38)	0.75 (0.43)**
WVS trust	0–1	0.66 (0.47)	0.70 (0.46)	0.62 (0.49)**
OTI trust scale	1–7	4.85 (0.92)	4.96 (0.89)	4.73 (0.94)***
Optimism	1–7	4.97 (1.01)	5.07 (1.01)	4.87 (1.00)**

Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .  
OTI=Organizational Trust Inventory; WVS=World Values Survey.

#### *Universalism*

Distributions of scores for universalism were highly negatively skewed, indicating that most people accepted universalistic values (Figure 13). With a mean score of 6.10 (SD=0.72) compared with 5.87 (SD=0.86), women reported slightly higher acceptance of universalistic values than did men ( $F=20.34$ ,  $df(1)$ ,  $p < 0.0001$ ).

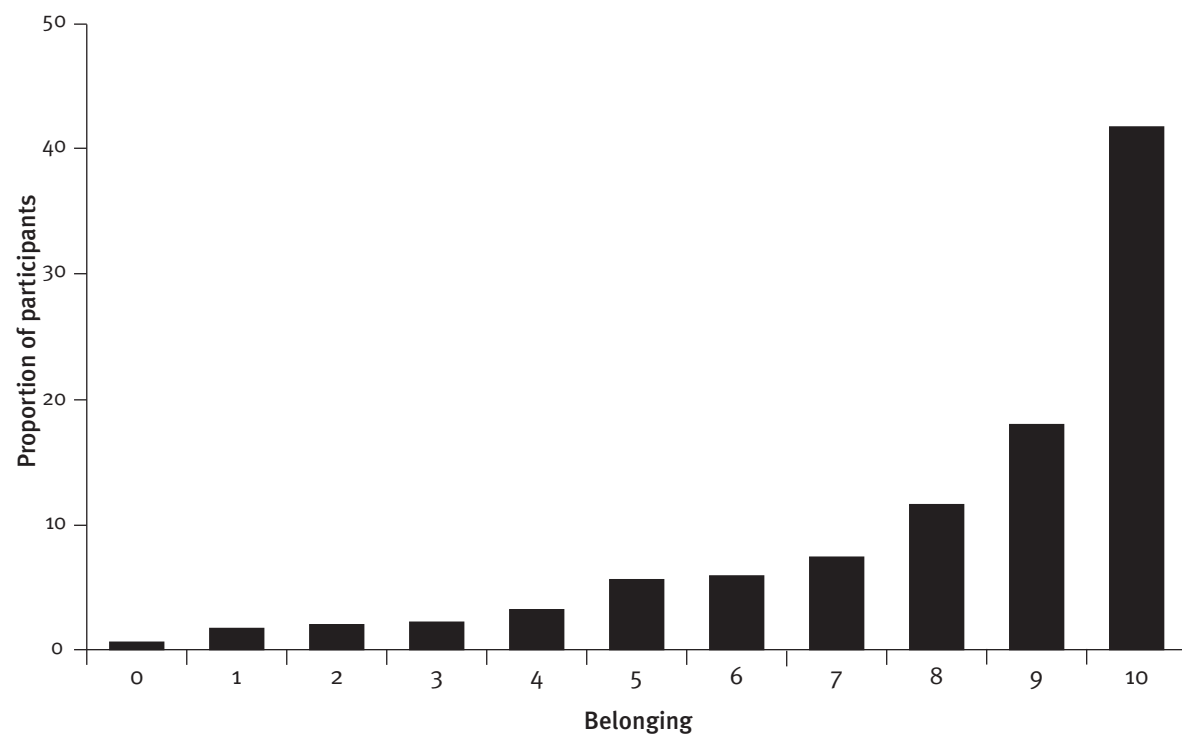
Figure 13: Frequency distribution for scores for universalism



### *Sense of belonging*

Distributions of scores for sense of belonging were highly negatively skewed, demonstrating that most people reported a strong sense of belonging. Almost half of the sample scored the maximum of 10 (see Figure 14). There were no sex differences among respondents in this study for sense of belonging.

Figure 14: Frequency distribution for scores for sense of belonging



### *Generalised reciprocity*

Reciprocity was measured via a single item from the WVS, as described in Section 2, with 79 per cent of participants in the present study agreeing that 'most people try to help'. At 83 per cent compared with 75 per cent, women were significantly and substantially more likely to endorse the reciprocity item than were men (see Table 6).

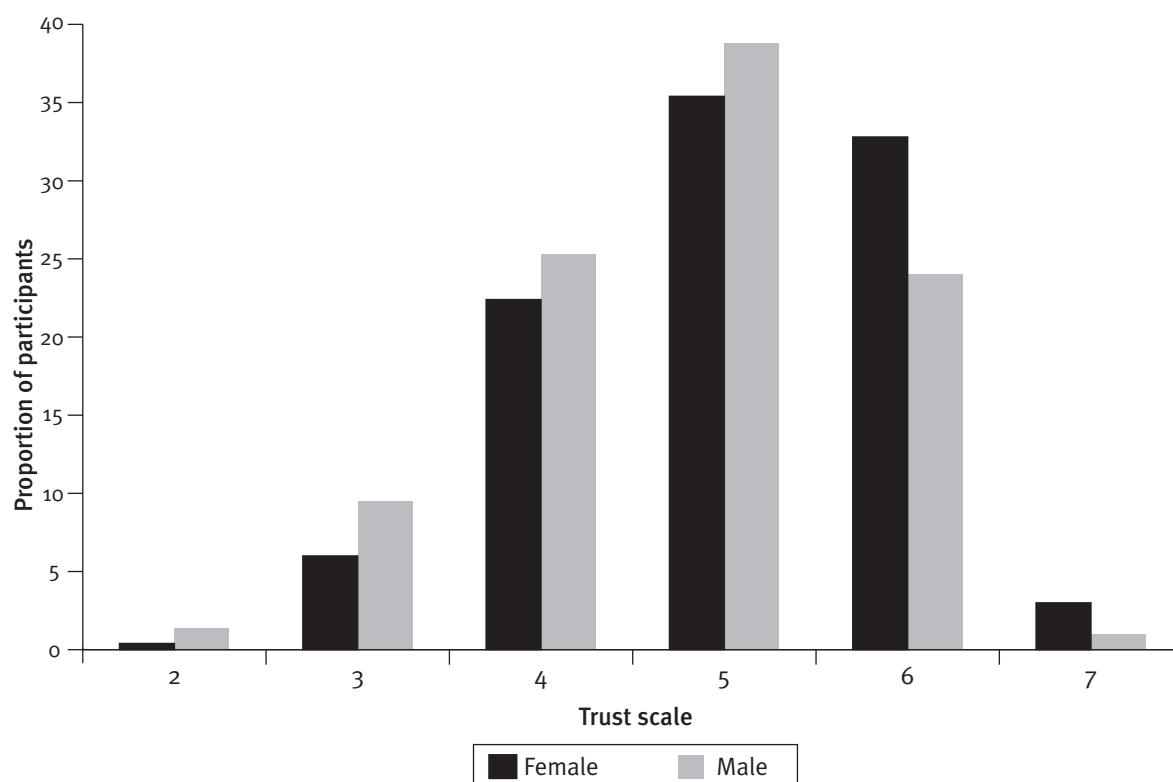
### *Social trust*

With a negatively skewed distribution of scores for the single item WVS measure of trust, 66 per cent of participants agreed that 'most people can be trusted'. On this measure, participants tended to trust rather than not to trust other people in general. Women were significantly, though only slightly, more likely than were men to agree that most people can be trusted.

Scores on the OTI measure of trust were also negatively skewed indicating that, on this more robust 12-item measure of trust (Berry & Rodgers 2003), participants also tended to trust rather than not to trust other people in general. There was a significant sex difference in scores on the OTI measure of social trust. Figure 15 displays the distribution of scores on the trust scale by sex and shows that women tended to report higher levels of trust in others than did men. The difference between the sexes was most apparent at the extremes of the scale, with men more likely to report extremely low levels of trust in other people in general and women more likely to report extremely high levels of trust.



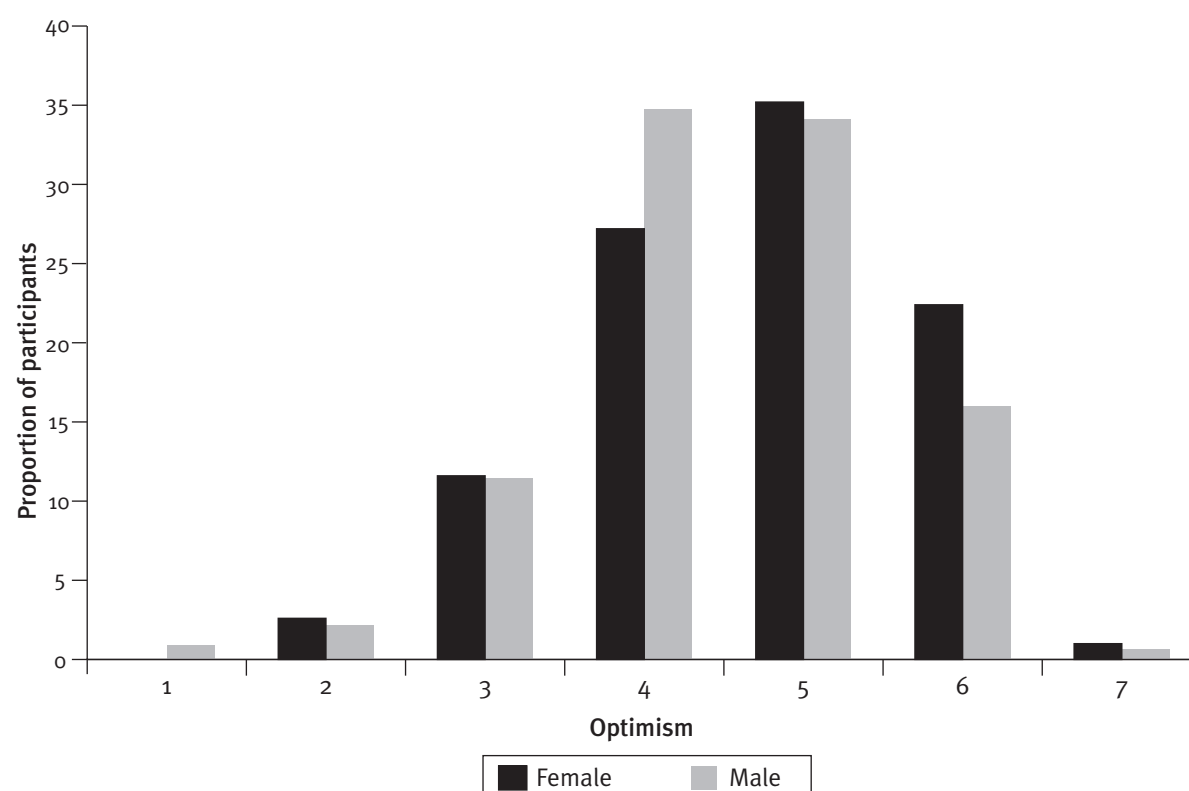
Figure 15: Distribution of scores on OTI trust scale by sex



### *Optimism*

There was also a significant sex difference in optimism scores (Table 6), with women reporting slightly higher levels of optimism than did men (Figure 16). Men were more likely than were women to report moderate levels of optimism, while women were more likely than were men to report high levels of optimism. Overall, with women attaining significantly higher scores than did men on universalism, generalised reciprocity, social trust and optimism, women demonstrated higher overall levels of personal social cohesion than did men.

Figure 16: Distribution of scores on optimism scale by sex



## 4.2 Personal social cohesion and community participation

Table 7 presents Pearson Product Moment correlation coefficients between the five participation indices and the five social cohesion measures together with zero-order and partial correlations between participation, cohesion and general psychological distress. Correlations and partial correlations between the participation and cohesion variables and distress were calculated controlling for sociodemographic characteristics: sex, age, Indigenous status, paid work status (employed at least six hours a week or not), poverty (having a health care card), low educational attainment (Year 12 or less) and having dependents under 5 years old.

### *Breadth and perceptions of participation—a brief review*

Relationships among the components of breadth of and perceptions about community participation were described in Section 3. In summary, those who reported greater breadth of participation were more likely to also report greater enjoyment of participation and to report lower levels of not enjoying participation and of participating too little. Breadth of participation was not related to perceptions about participating too much.

Those who reported participating too much were slightly more likely to also report not enjoying participating, and less likely to report enjoying participating. Participating too much was not associated with participating too little. Respondents reporting participating too little tended to also report less positive enjoyment of participating and, to a very small degree, actively not enjoying participating. Enjoying and not enjoying participation were negatively associated such that those reporting higher levels of enjoying participating reported lower levels of not enjoying participating.

### **Associations among components of social cohesion**

Correlations among the components of social cohesion ranged from non-significant to moderately strong (Pearson's  $r=0.02$  to  $0.54$ ). Universalism and sense of belonging were not significantly associated. All other pairs of components were positively significantly related indicating that higher scores on one component were related to higher scores on another. In almost all cases, correlations between the OTI measure of trust and the other components of cohesion were stronger than were the correlations between the WVS trust item and the other components.

**Universalism** was weakly related in order of magnitude of the association to optimism, the OTI measure of trust, reciprocity and the WVS trust item. **Sense of belonging** was weakly related to reciprocity, the WVS trust item and universalism, and moderately related to optimism and the OTI trust measure. **Reciprocity** was weakly related to optimism and universalism, moderately related to sense of belonging and moderately-strongly related to both measures of trust. The **OTI measure of trust** was weakly related to universalism, moderately related to sense of belonging, and moderately-strongly related to optimism, the WVS trust item, and reciprocity. The **WVS trust item** was weakly related to sense of belonging and universalism, moderately related to optimism, and moderately-strongly related to the OTI trust measure and reciprocity. Finally, **optimism** was weakly related to reciprocity and universalism, moderately related to the WVS trust item and sense of belonging, and moderately-strongly related to the OTI trust measure.

### **Associations between community participation and cohesion: the importance of sense of belonging**

Participating too little was not associated with the WVS trust item. All other correlations between breadth and perceptions of community participation and personal social cohesion were statistically significant and in the expected direction. That is, breadth and enjoyment of participation were associated with higher levels of cohesion, while perceptions of participating too much or too little, and of not enjoying participating, were associated with lower levels of cohesion. At  $r=0.40$ ,  $p<0.001$ , the largest correlation was obtained between breadth of participation and sense of belonging. Moderate correlations were also found between enjoying participating and sense of belonging, the OTI trust measure and optimism.

Table 7: Correlations coefficients among components of community participation and personal social cohesion, and zero-order and partial correlations with psychological distress

	2	3	4	5	6	7	8	9	10	11	Psychological distress <sup>(a)</sup>	
											Zero-order	Partial
Breadth of participation	-0.06	-0.24***	0.40***	-0.09**	0.14***	0.40**	0.18**	0.28**	0.17**	0.25**	-0.28***	0.00
Too much participation	-	0.01	-0.14***	0.08*	-0.12***	-0.16**	-0.11*	-0.18**	-0.13**	-0.18**	0.22***	0.08**
Too little participation		-	-0.15***	0.07*	0.00	-0.26**	-0.08*	-0.14**	-0.03	-0.19**	0.28***	0.12***
Enjoyable participation			-	-0.21***	0.16***	0.30**	0.17**	0.31**	0.15**	0.31**	-0.30***	-0.06*
Unenjoyable participation				-	-0.09**	-0.10*	-0.09*	-0.10*	-0.06	-0.10*	0.13***	0.04
Universalism					-	0.02	0.12***	0.15***	0.08**	0.22***	-0.05	0.07**
Belonging						-	0.26***	0.35***	0.24***	0.37***	-0.41***	-0.11***
Reciprocity							-	0.48***	0.48***	0.28***	-0.27***	0.00
OTI measure of trust								-	0.52**	0.54***	-0.49***	-0.13***
WVS trust item									-	0.35***	-0.32***	-0.03
Optimism										-	-0.55***	-0.26***

(a) Controlling for sex, age, Indigenous status, paid work status, having a health care card (poverty), less than high school education and dependents under 5 years.

Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

OTI=Organizational Trust Inventory; WVS=World Values Survey.

All other correlations were small, suggesting that the connection between participation and cohesion operated primarily between positive aspects of participation (breadth and enjoyment) and key aspects of cohesion, especially sense of belonging.

### 4.3 Participation, cohesion and distress

Table 7 presents zero-order and partial correlations between the participation indices and social cohesion measures with the K10 measure of general psychological distress. Partial correlations represent the unique correlation between each measure of participation or cohesion with distress, removing the influence of all other measures of participation and cohesion and controlling for sociodemographic characteristics.

#### Zero-order and partial correlations

With the exception of universalism, all zero-order correlations between indices of community participation and components of personal social cohesion were statistically significantly associated with distress in the expected direction. Higher levels of enjoying participating and greater breadth of participation were associated with lower levels of distress, while higher levels of not enjoying participating (men only,  $r=0.22$ ,  $p<0.0001$ ) and of participating too much or too little were related to higher distress scores. Consistent with another Australian study (Phongsavan et al. 2006), higher scores on all components of cohesion were associated with less distress. The relationships between the participation indices and distress were small to moderate, while those between the components of cohesion and distress tended to be moderate to strong.

Examination of the partial correlation coefficients revealed that, when taking account of all variables simultaneously, there was no residual relationship between distress and breadth of participation, not enjoying participating, reciprocity and the WVS trust item. The strength of the associations among the other variables and distress remained statistically significant but smaller. In order of magnitude, largest first, optimism, the OTI trust measure, too little participation, sense of belonging, too much participation, universalism (higher levels of which were, in multivariate analysis, related to higher levels of distress),<sup>8</sup> and enjoying participation were related to distress.

### 4.4 Testing a mediated model

Based on the conceptual model presented in Section 1, a mediated model was tested in which the relationship between community participation and general psychological distress took effect through its relationship with personal social cohesion. A hierarchical multiple linear regression analysis was estimated to evaluate the multivariate relationships among sociodemographic characteristics (Model 1), breadth of and perceptions about participation (Model 2), and personal social cohesion (Model 3) as predictors of psychological distress.

**Table 8: Multiple hierarchical regression estimates for the prediction of psychological distress by sociodemographic factors, participation and personal social cohesion (n=963)**

	B	Standard error B	$\beta$	$R^2$
Model 1: Sociodemographic factors				
Age	-0.11	0.01	-0.31***	0.07***
Health care card	1.93	0.44	-0.16***	
In paid work (6+ hours/week)	-1.66	0.51	-0.14***	
Dependants under 5 years	-2.09	0.67	-0.10**	
Model 2: Participation indices				
Age	-0.07	0.01	-0.21***	0.23***
Health care card	1.35	0.41	0.11***	
In paid work (6+ hours/week)	-1.91	0.46	-0.15***	
Dependants under 5 years	-1.90	0.61	-0.09**	
Breadth of participation	-0.36	0.12	-0.09**	
Too much participation	1.79	0.33	0.16***	
Too little participation	0.89	0.12	0.22***	
Enjoyable participation	-0.62	0.11	-0.18***	
Unenjoyable participation	0.73	0.38	0.06*	
Model 3: Personal social cohesion				
Age	-0.05	0.01	-0.14***	0.44***
In paid work (6+ hours/week)	-1.03	0.40	-0.08**	
Dependants under 5 years	-1.13	0.53	-0.06*	
Too much participation	0.93	0.29	0.08***	
Too little participation	0.55	0.11	0.14***	
Enjoyable participation	-0.23	0.10	-0.07*	
Universalism	0.58	0.20	0.08**	
Belonging	-0.36	0.08	-0.14***	
Trust-OTI scale	-1.14	0.23	-0.17***	
Optimism	-2.00	0.19	-0.33***	

Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

OTI=Organizational Trust Inventory.

### **Sociodemographic factors**

Sociodemographic characteristics were entered into the analysis in step 1. These were:

- sex
- age
- health care card status (a proxy measure of low income)
- Indigenous status
- years of education
- paid work
- living alone
- having dependant children under 5 years of age
- having dependant children aged 6 to 12 years
- having dependant teenage children
- having dependant adult children.

The index of breadth of participation and the four perceptions of participation indices were added at the second step of the analysis. Universalism, sense of belonging, reciprocity, two trust measures (single item and a scale measure) and optimism were added in the third step of the analysis. After each step of the analysis, non-significant predictors were deleted and the analysis was re-run so that only significant predictors were retained in the model. The final predictors, with unadjusted and standardised beta coefficients, are presented at Table 8.

### *Participation*

Sociodemographic characteristics alone accounted for 7 per cent of the variance in psychological distress. Four of the characteristics retained significance in the model, independently contributing to explaining variance in distress. Increasing age, being in paid work and having dependents less than 5 years old were associated with lower psychological distress, while having a health care card was related to increased distress. These characteristics were retained in model 2.

Adding breadth of participation and perceptions about participation to the model explained in total 23 per cent of the variance in distress. All indices were significantly related to psychological distress and retained in Model 3.

Greater breadth of participation and enjoying participation were related to lower levels of distress, while too much participation, too little participation and, to a very small degree, not enjoying participating were associated with higher distress scores. All four sociodemographic characteristics retained significance in Model 2 and were carried forward, with the participation indices, to Model 3.

### *Social cohesion*

Poverty (having a health care card) did not make an independent contribution to explaining variance in distress when social cohesion variables were entered in Model 3. It was deleted from the final model. Two of the participation indices—breadth of participation and not enjoying participating—also failed to contribute independently to explaining variance in distress in Model 3 and were deleted. This suggests a mediation effect in which the relationship between breadth of participation and not enjoying participating was accounted for by their shared variance with the social cohesion variables. Partial mediation was evident for the other participation variables, with standardised beta values in all cases smaller in magnitude in Model 3 than they were in Model 2.



*The final model*

Of the components of personal social cohesion, four contributed significantly independently to explaining variance in distress scores—optimism, social trust, sense of belonging and universalism—while the WVS measures of trust and reciprocity did not. They were deleted. In the final model, increasing age, being in paid work, having dependents under 5 years old, enjoying participating, not participating too much or too little, **not** having universalistic values, having a sense of belonging, trust in others and optimism independently contributed to explaining a total of 44 per cent of variance in distress scores. While sense of belonging demonstrated the largest bivariate correlation with distress, its beta value in the final regression model was the third largest of the cohesion estimates, behind trust and optimism. This suggests that its relationship with distress might be partially mediated via other aspects of cohesion.



## 5 Personal social capital and psychological distress

### Section summary

This section begins with an introduction to structural equations modelling, with an emphasis on one-factor congeneric modelling. Information is presented about the assumptions underlying this form of modelling, about the criteria for evaluating the models, and about when and how models may be modified. Following this introductory material, four one-factor congeneric models are presented that analyse and define the concepts of social trust, sociodemographic disadvantage, community participation and personal social cohesion. Statistics are complemented with graphic representations of the models. The final part of the section describes how a hypothetical model of personal social capital and psychological distress was construed and tested. The section finishes by describing the results of this testing and presenting and analysing the final fitted structural model.

In Section 4, hierarchical linear regression modelling indicated support for the mediation hypothesis illustrated in the conceptual model presented in Section 1. That is, the relationship between community participation and psychological distress appeared to result from their shared relationship with personal social cohesion—the social capital hypothesis. With preliminary support for this hypothesis, it was appropriate to test the model via structural equations modelling.

### 5.1 Structural equations modelling

#### Introduction to one-factor congeneric models

One-factor congeneric modelling is a form of latent factor modelling and a subset of confirmatory factor analysing, itself one of a large family of statistical techniques grouped under the umbrella term of structural equations modelling. Commentary in this section focuses particularly on issues relating to building one-factor congeneric models and confirmatory factor models. The work of Phillip Holmes-Smith on the techniques of structural modelling is acknowledged in the preparation of this section (Holmes-Smith & Coote 2001).

Like exploratory factor analysis, confirmatory factor analysis and its subset, one-factor congeneric modelling, are based on patterns of associations among a set of intuitively related variables. But while exploratory factor analysis is used in the early stages of research to help reveal hypothesised processes underlying the set of variables, confirmatory factor analysis is used when hypothetical structures have been established and more precise and rigorous testing is required (Tabachnik & Fidell 2001).

Models are constructed as diagrams in which latent concepts are by convention shown as ellipses. Observed variables measuring the latent concepts are presented in rectangles connected by arrows to the ellipse, as shown. The arrows indicate the assumption that the latent concept cannot be directly measured. Its existence is inferred because it ‘causes’ or gives rise to the observed variables that can be directly measured.

Each latent concept, together with the set of items measuring it, forms a single ‘one-factor congeneric model’. The model assumes that the items measuring the latent construct differ in the magnitude of the contribution they make to explaining variance in the latent variable, and in the measurement error associated with them. One-factor congeneric models are the basic measurement models in confirmatory factor analysis and structural models. Building them is the first step in building a confirmatory factor or structural model. The first step in testing a hypothesised factor structure is to test the validity of each one-factor model separately. The Australian Community Participation Questionnaire contains 14 factors (different types of community participation) that were tested in this way. More information on this process has been published (Appendix C)

with detailed supplementary tables summarising model fits and giving details of fit statistics and retained questionnaire items in Appendix E.

### **More about one-factor congeneric models**

In a little more detail, one-factor congeneric models are basic measurement models in which scores on a number of observed variables are combined in a weighted fashion to measure a latent trait. They differ from other forms of weighted combinations of observed variables in two important regards. One is that they model individual error variances for each item as well as modelling shared error variance between items and the latent factor, and the error variance of the latent factor. Thus they differentiate between and take account of explained and unexplained variance. Secondly, it is possible to test statistically how well a one-factor congeneric model fits the data, and then to adjust the model to enhance fit with reference to a series of substantive and statistical criteria. One benefit this delivers is that it is possible to identify and, if appropriate, exclude items that are not valid indicators of a latent trait.

The final solution to a well-fitting one-factor congeneric model provides, among other things, a set of valid items together with accurate weightings that can be applied to the items to form very accurate composite scores for use in later analyses. As a result, it is possible to generate accurate composite scale reliabilities and to fix parameter estimates in more complex models (see next subsection). Fixing parameter estimates:

- further enhances the accuracy of the estimates of the whole model
- can make estimable a model that otherwise would not be
- reduces the required sample size.

Sample size is a significant issue in structural equations modelling and is discussed further below.

### *Dealing with problems fitting models*

As latent models, one-factor congeneric models must include a minimum of two observed variables. In practice, it is not possible to fit two-variable models because the equations to be solved do not contain sufficient known parameters to estimate the unknown parameters. Such models are known as ‘unidentified’ models and, in this case, additional parameters have to be fixed. This can sometimes be done, for example, if the items belong to a standardised scale with known item weightings. If it is not possible to fix additional parameters, fitting must be abandoned in favour of some other strategy.

A related problem arises with three-variable models. These models are ‘saturated’, that is, contain the same number of known as unknown parameters. As a result, it is only possible to generate one solution to the equations. Structural equations modelling relies on having more parameters than are required so that it is possible to generate a series of solutions to the equations. The solutions can be compared with one another. Fit indices are used to evaluate the relative fit of different solutions relative to the observed data and thus to identify an optimal and well-fitting solution. While it is not possible to evaluate the fit of a three-item model, the solution generates error variance estimates, which can be fixed in the model. Once these are fixed, the relative number of unknown to known parameters increases and it becomes possible to fit the model. This problem did not arise in this study.

## **5.2 Aims of one-factor congeneric modelling**

The aims of the one-factor congeneric modelling were to:

- test and refine an optimal item structure for each part of the structural model
- identify valid items and generate weightings for the creation of composite scores for social trust
- build the input elements required for the structural model.

### Assumptions: sample size and normality of distribution

Structural equations modelling, including confirmatory factor analysis and one-factor congeneric modelling, requires large sample sizes because not only does it model variance associated with observed variables but also variance associated with latent (unobserved) variables. This means that a larger number of parameters are estimated, requiring a larger sample size. For the structural model, there were 16 observed variables and three latent variables, each with error terms (38 in total), together with seven pathways between elements of the model. This generated a total of 45 parameters to be estimated. Applying a rough guide that 10 cases are required per parameter to generate reliable estimates, a sample size of around 450 cases was required. In terms of this guide the sample size in this study of  $n=963$  was adequate, especially given that sample size requirements can be relaxed in data sets in which the factor loadings are substantial or there are several observed variables per unobserved variable, both of which are the case here.

For the one-factor congeneric modelling, in which the basic measurement models are built one at a time, sample size requirements are much smaller. This is because for each one-factor congeneric model, only a few parameters are estimated at a time. Thus the sample size of  $n=963$  is ample for this first step in testing the hypothesised factor structure. Parameter estimates derived from the one-factor modelling can be used to fix parameters in the full confirmatory model, greatly reducing the number of parameters to be estimated in that model.

However, unlike in exploratory factor analysis, in structural equations modelling, sample size requirements are complicated by non-normality in the distribution of observed variables. When the distribution of variables is very skewed, as it is for many of the variables in this data set, the probability of rejecting an acceptable hypothesised model can be inflated to more than one in three, which is unacceptable. The sample size required in such situation can become very large, at least  $1.5k(k+1)$ , where  $k$  is the number of variables in the model. However, based on the 16 items in the proposed structural model, 383 cases would be required, and the present sample size of  $n=963$  remains adequate. To overcome the difficulty of skewness, an asymptotic distribution free (ADF) estimation procedure that does not assume normality of distribution is preferred. Alternatively, a maximum likelihood estimation procedure (which is robust even with small or non-normally distributed samples) is used together with a post-hoc adjustment to two of the evaluation criteria—the Chi-square statistic and the standard error estimates. These criteria and others are discussed in more detail below. In AMOS, the software used for this analysis, ADF estimation is available and was used.

### *Bimodal data*

Separately from issues of sample size, it should be noted that it is not possible to include in structural equation models variables with bimodal distributions. Such data have to be reduced to categorical variables or be deleted. This issue arose during development of the Australian Community Participation Questionnaire which was used in the present study. For the questionnaire, it was appropriate to create dichotomous nominal variables out of the variables with bimodal distributions. That is, rather than deleting variables or analysing scale values indicating the degree to which respondents reported engaging in a particular activity, scores were recorded as '1' or '0', 'engaging' or 'not engaging' in the activity. This problem did not arise in the development of one-factor congeneric models for the present study because there were no bimodal distributions, and thus no requirement to delete or dichotomise variables.

### Criteria for evaluating the models

A model is said to fit the data based on a holistic judgment with respect to a number of criteria (Table 9). The first evaluated was the **Chi-square statistic** indicating whether the reproduced covariance matrix is statistically different from the observed matrix. To reject the null hypothesis in structural equations modelling, Chi-square should be non-significant, indicating the observed and reproduced matrices are not statistically different. This is the least important fit statistic because it is very sensitive to sample size: except with very small samples, the Chi-square is usually significant. Nevertheless, a Chi-square value of  $p>0.05$  was obtained where possible.

The second criterion was the **standard error of the estimate**. If the estimate of a parameter is greater than twice its standard error, the parameter is statistically different from zero and should be retained in the model. The third criterion was the t-statistic, or **critical ratio** (CR), that also indicates the significance of a parameter estimate. To reject the null hypothesis that the parameter is not statistically different from zero, the t-statistic should be greater than plus or minus two.

### *Fit indices*

Fourth, **goodness-of-fit indices** were evaluated (Table 9). These are the most important and comprehensive statistical indicators of model adequacy. They fall into three categories:

- ▶ absolute fit indices
- ▶ incremental fit indices
- ▶ indices of model parsimony.

A well-fitting model would be expected to fit on a wide range of indices and a variety of fit statistics are usually reported (Table 9 shows the most common, which have been used in this study).

**Table 9: Commonly reported goodness-of-fit indices for structural equation models**

Index name	Acronym	Range	Acceptable values
Absolute fit statistics			
Chi-squared	CMIN	–	$p > 0.05$
Normed Chi-squared	CMIN/DF	–	Usually 1 to 2
Root mean square error of approximation	RMSEA	0–1	$< 0.05$ – $0.08$
Root mean square residual	RMR	0–1	$< 0.05$
Incremental fit indices			
Goodness-of-fit indicator	GFI	0–1	$> 0.90$
Adjusted goodness-of-fit indicator	AGFI	0–1	$> 0.90$
Rho2/Tucker Lewis Index <sup>(a)</sup>	TLI	0–1	$> 0.90$
Comparative fit index	CFI	0–1	$> 0.95$
Normed fit index	NFI	0–1	$> 0.90$
Indices of model parsimony			
Akaike information criterion	AIC	Varies	Lowest possible
Consistent Akaike information criterion	CAIC	Varies	Lowest possible

(a) The Tucker Lewis Index sometimes achieves a value greater than 1.

Note: ‘–’=not applicable.

Generally, the most important and frequently reported **absolute fit indices** are the Root Mean Square Error of Approximation (RMSEA) and the Root Mean Square Residual (RMR). The most important **incremental fit indices** are the Goodness-of-Fit Indicator (GFI) and the Adjusted Goodness-of-Fit Indicator (AGFI), the Rho2/Tucker Lewis Index (TLI) and the Comparative Fit Index (CFI). Of the two parsimony statistics, the Akaike Information Criterion (AIC) and the Consistent Akaike Information Criterion (CAIC), the AIC is preferred to the very conservative CAIC.

**Parsimony indices** do not have particular criteria thresholds and their values are not often reported. The indices are based on the assumption that the fewer the parameters in a model, the more likely it is that the model will be able to be generalised from the sample to the general population. Further, most models may be made to fit a data set by saturating them, that is, by including all possible parameters. The AIC and CAIC are

methods of calculating penalties for every parameter added to a model. Model modification is discussed more in the next section, but briefly, the values of the indices start out large. As parameters are modified, and the fit of the model improved, the statistic gets smaller, until it is quite small. If parameters continue to be added in an attempt to fit, or enhance fit, the statistic starts to get bigger again. The best fitting model in terms of the parsimony fit indices is the model at which the lowest value was achieved during the process of modifying parameters.

The strength of one-factor congeneric model solutions may also be evaluated by examining **item reliabilities** and **maximised scale reliabilities**. In one-factor congeneric models, item reliability is indicated by the squared multiple correlation of the item. Optimally, this will be greater than 0.50, though items with squared multiple correlations as small as 0.30 may be acceptable and retained in the model if there are theoretical reasons to do so. In developing the Australian Community Participation Questionnaire (ACPQ), which has been used in the present study, all items were theoretically acceptable and item reliability cut-points were set at greater than 0.30. Maximised scale reliabilities (squared multiple correlations for the factors) were also examined for the ACPQ and evaluated together with the more conservative Cronbach's  $\alpha$  reliability coefficient. These indicate the internal consistency of composite scales. Maximised scale reliability is the more accurate of the two measures because Cronbach's  $\alpha$  reliability coefficient assumes tau-equivalent models. That is, all items are assumed to contribute equally to explaining variance in the concept they measure and have equal error variances. Maximised scale reliability does not make this assumption. High reliability values are desirable because they indicate that the composite is an accurate measure of true scores. Scale reliabilities were not examined for the present study because scale development was not a goal of, or appropriate for, the study.

### **Procedure for modifying models**

Models that do not fit the data may be modified. Modifying models means adding, removing or changing the nature of relationships among variables in the model, including among error terms.

There are three main statistical indicators that model modification is advisable:

- fit indices show, on balance, that the model does not fit the data well
- modification indices suggest a different model would fit the data better
- there are non-significant paths in the model.

Consistent with the assumptions of the parsimony fit criteria, the first step in modifying the models is to remove non-significant paths. These are paths with a critical ratio of less than two.

After non-significant paths have been removed, the model may still not fit the data. In this case, modification indices are inspected to identify whether any parameter changes would improve the model fit. If so, parameters are modified one at a time, starting with the one that would have the greatest effect on the model fit if it were modified. Parameters are only modified when it makes substantive sense to do so. Thus if it does not make sense to modify the parameter with the largest modification index, the parameter with the next largest index is considered, and so on, until an appropriate parameter is identified. Following modification of this parameter, the change on the overall model is comprehensively evaluated and the process repeated until an optimal solution is identified.

A particular goal of one-factor congeneric model building is to identify, with a view to the possibility of excluding, items that reduce the construct validity of the measurement model. These items may be identified before structural modelling begins, for example, during preliminary data screening. In one-factor congeneric modelling, outlying items are those that have low regression weights, squared multiple correlations of less than 0.30, low factor weights or which, following model modification based on the modification indices, require several covariances on their error term (which indicates the likelihood of collinearity with another variable). Items that exhibit some or all of these characteristics may be considered for deletion from the model.

### 5.3 One-factor congeneric models: trust, disadvantage, participation and cohesion

Four one-factor congeneric models were constructed for this study, one for social trust (for the purpose of creating an accurate composite score), and three for inclusion as sub-models within a larger structural model. These three were for sociodemographic disadvantage, community participation and personal social cohesion. As is conventional, a regression weight of 1 was assigned in each model to the parameter representing the highest loading item for each factor, as suggested by preliminary exploratory factor analysis. This is a necessary step in building the models, but the choice of which parameter to assign the weighting of 1 does not affect the outcome of the computations. However, as all parameters are estimated with reference to that parameter, this gives it a status equivalent to that of a 'marker variable' in an exploratory factor analysis, aiding later interpretation of results.

#### Model fitting in the present study

Table 10 summarises the fit statistics for the hypothesised and fitted models for the one-factor congeneric models, the start and end values for the Akaike Information Criterion (AIC), and a summary of the goodness-of-fit indices. In all cases, the AIC was smaller after model fitting than it was at the start, indicating that fitting had not been achieved by overfitting, saturating, or near-saturating the models. Item and scale reliabilities are not reported as scale development was not a goal of, and is not appropriate for, this study. During fitting, no outlying items were identified or excluded from the models.

**Table 10: Summary of fit indices for one-factor congeneric models comparing the hypothesised model (Model A) and the fitted model (Model B) for sociodemographic disadvantage, community participation, social trust and personal social cohesion**

Component of structural model	Selected fit indices (absolute, incremental)	Acceptable values	Sample statistic		Meets criterion	
			Model A	Model B	Model A	Model B
Social trust (AIC: start=37.81; end=20.11)	CMIN	$p > 0.05$	21.81	2.11	×	✓
	CMIN/DF	1 to 2	10.90	2.11	×	✓
	RMSEA	<0.05–0.08	0.10	0.03	×	✓
	RMR	<0.05	0.03	0.01	✓	✓
	GFI	>0.90	0.99	1.00	✓	✓
	AGFI	>0.90	0.96	0.99	✓	✓
	TLI	>0.90	0.86	0.98	×	✓
	CFI	>0.95	0.95	1.00	×	✓
	NFI	>0.90	0.95	1.00	✓	✓



Component of structural model	Selected fit indices (absolute, incremental)	Acceptable values	Sample statistic		Meets criterion	
			Model A	Model B	Model A	Model B
Sociodemographic disadvantage (AIC: start=22.04; end=–)	CMIN	$p > 0.05$	2.04	–	✓	–
	CMIN/DF	1 to 2	0.41	–	✓	–
	RMSEA	$< 0.05$ – $0.08$	0.00	–	✓	–
	RMR	$< 0.05$	0.00	–	✓	–
	GFI	$> 0.90$	1.00	–	✓	–
	AGFI	$> 0.90$	1.00	–	✓	–
	TLI	$> 0.90$	1.02	–	✓	–
	CFI	$> 0.95$	1.00	–	✓	–
	NFI	$> 0.90$	0.99	–	✓	–
	CMIN	$p > 0.05$	22.16	4.43	×	✓
	CMIN/DF	1 to 2	4.32	1.08	×	✓
Community participation (AIC: start=42.16; end=26.32)	RMSEA	$< 0.05$ – $0.08$	0.06	0.01	✓	✓
	RMR	$< 0.05$	0.06	0.03	×	✓
	GFI	$> 0.90$	0.99	0.99	✓	✓
	AGFI	$> 0.90$	0.97	1.00	✓	✓
	TLI	$> 0.90$	0.84	1.00	×	✓
	CFI	$> 0.95$	0.92	1.00	×	✓
	NFI	$> 0.90$	0.90	0.98	✓	✓
	CMIN	$p > 0.05$	55.35	2.98	×	✓
	CMIN/DF	1 to 2	11.07	1.15	×	✓
	RMSEA	$< 0.05$ – $0.08$	0.10	0.02	×	✓
	RMR	$< 0.05$	0.12	0.02	×	✓
Personal social cohesion (AIC: start=73.35; end=28.98)	GFI	$> 0.90$	0.96	1.00	✓	✓
	AGFI	$> 0.90$	0.89	0.99	×	✓
	TLI	$> 0.90$	0.70	0.99	×	✓
	CFI	$> 0.95$	0.85	1.00	×	✓
	NFI	$> 0.90$	0.84	0.99	×	✓

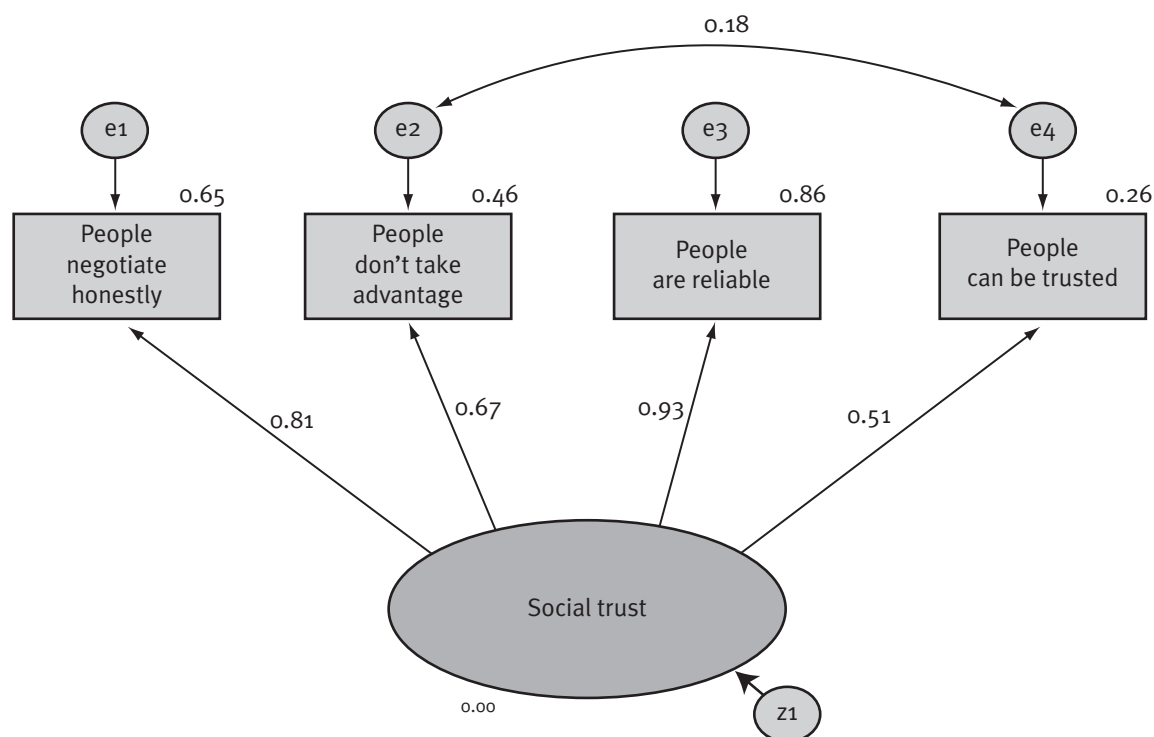
Note: ‘–’=not applicable (model fitted without modification).  
For explanation of acronyms, see Table 9.

### Social trust

This model includes four items (Figure 17). Absolute fit indices, except for the RMR, suggested that the hypothesised model did not fit the data, though three of the five incremental fit indices suggested the data did fit the model. Modification was undertaken to attempt a better fit. Acceptable item regression weights, squared multiple correlations and factor weights indicated that it was not appropriate to delete any items and the modification indices were inspected. These indicated that two of the error terms could be co-varied.

Following this, all indices showed that the model fit the data well. The parsimony index (the AIC) and all indices that fit in the unmodified model showed improved fit in the modified model. Taken together, the indices showed that the modified model fit the data well and a composite score for social trust could be accurately calculated (see Section 2). In the final model, the item with the largest weighting and that which best reflected the construct of social trust was the belief that people are reliable. The latent factor, social trust, explained 86 per cent of variance in the subscale 'people are reliable'.

Figure 17: Fitted one-factor congeneric model of social trust

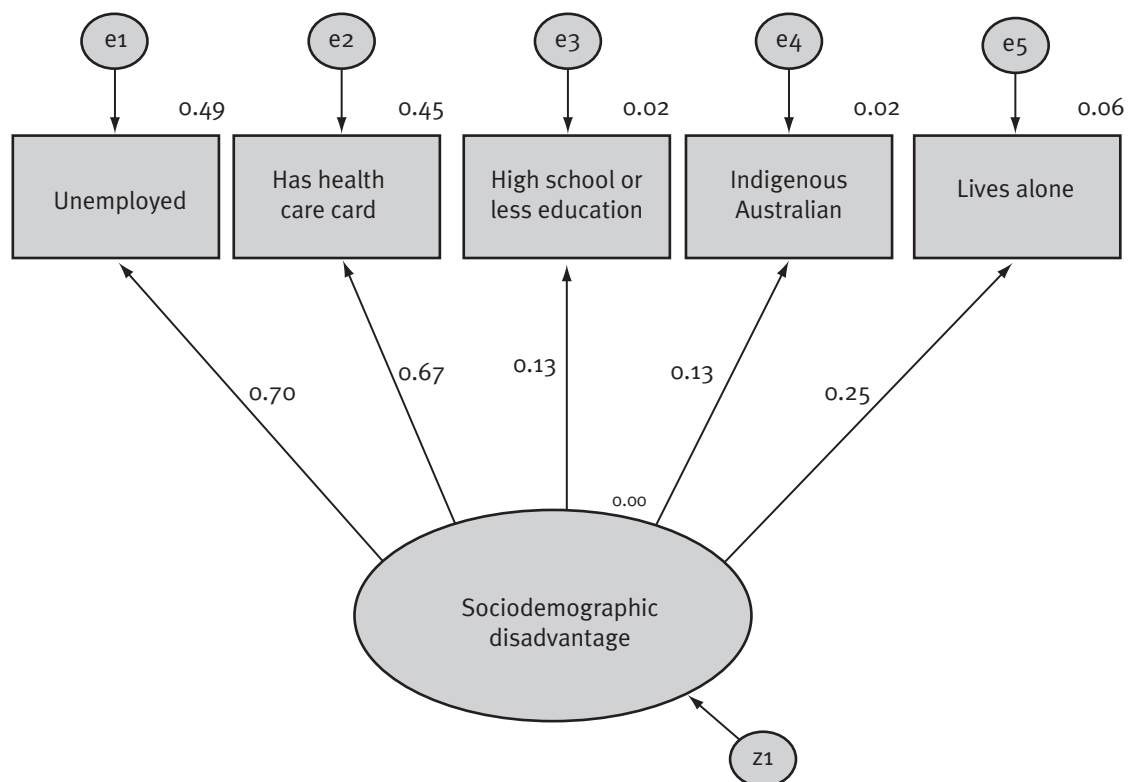


The belief that people negotiate honestly also loaded very heavily on the latent factor, with social trust explaining 65 per cent of variance in that subscale. Social trust may be interpreted as indicating a belief that, generally speaking, most people do what they say they will and act honestly.

### *Sociodemographic disadvantage*

This model includes five items (Figure 18). All fit indices suggested the data fit the model well. Acceptable item regression weights, squared multiple correlations and factor weights indicated that it was not appropriate to delete any items. No model modification was necessary. The items with the largest weightings and which best reflected the construct of sociodemographic disadvantage as defined in this study were not being in paid employment and having a health care card (a proxy for poverty). The latent factor, sociodemographic disadvantage, explained 49 per cent of variance in unemployment and 45 per cent of variance in poverty, suggesting that unemployment and poverty were the key components of sociodemographic disadvantage in this study.

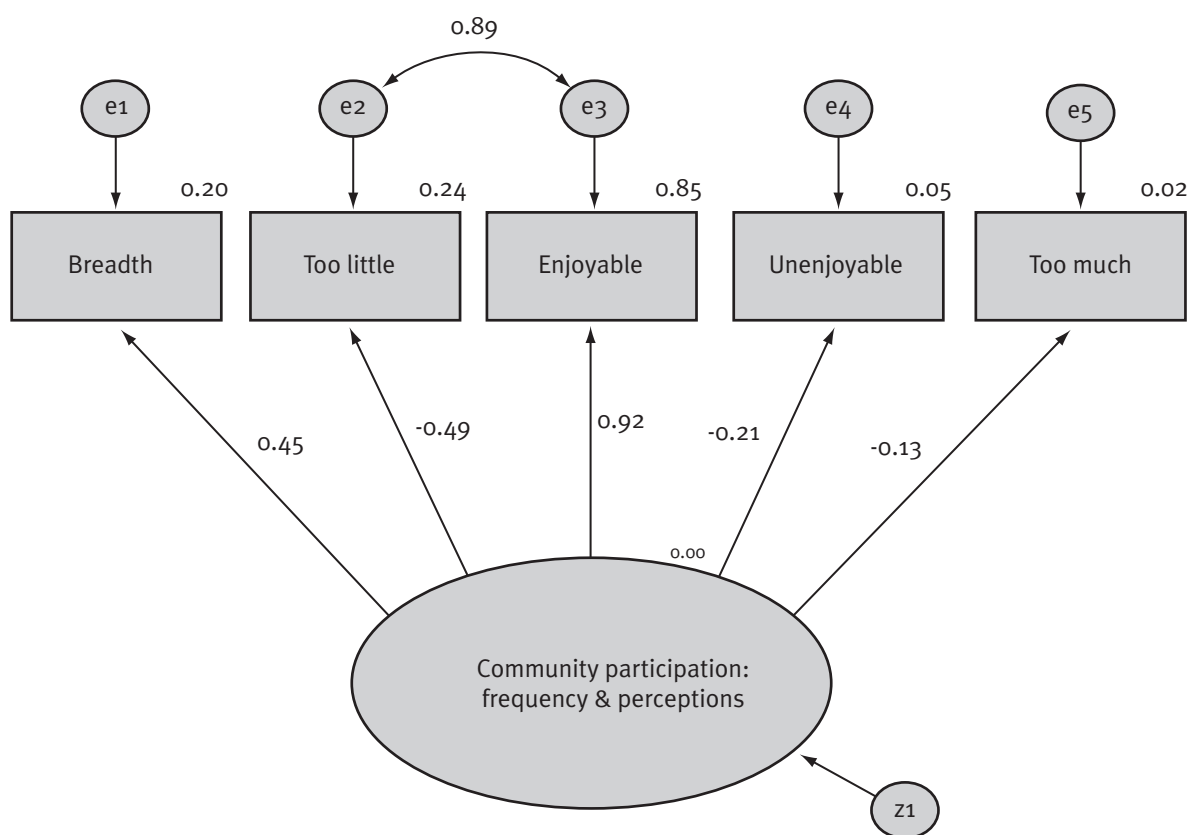
Figure 18: Fitted one-factor congeneric model of sociodemographic disadvantage



### *Community participation*

This model includes five items, one index measuring breadth of participation and four indices measuring perceptions about the amount of time spent participating (too much or too little) and the experience of participating (enjoyable or unenjoyable) (Figure 19). Absolute fit indices, except for the RMR, suggested that the hypothesised model did not fit the data, though three of the five incremental fit indices suggested the data did fit the model well. Modification was undertaken to attempt a better fit. Acceptable item regression weights, squared multiple correlations and factor weights indicated that it was not appropriate to delete any items. The modification indices were therefore inspected. These indicated that two of the error terms could be covaried. This was undertaken, following which all indices showed that the model fit the data well. The parsimony index (the AIC) and all indices that fit in the unmodified model showed improved fit in the modified model. Taken together, the indices showed that the modified model fit the data well.

Figure 19: Fitted one-factor congeneric model of community participation



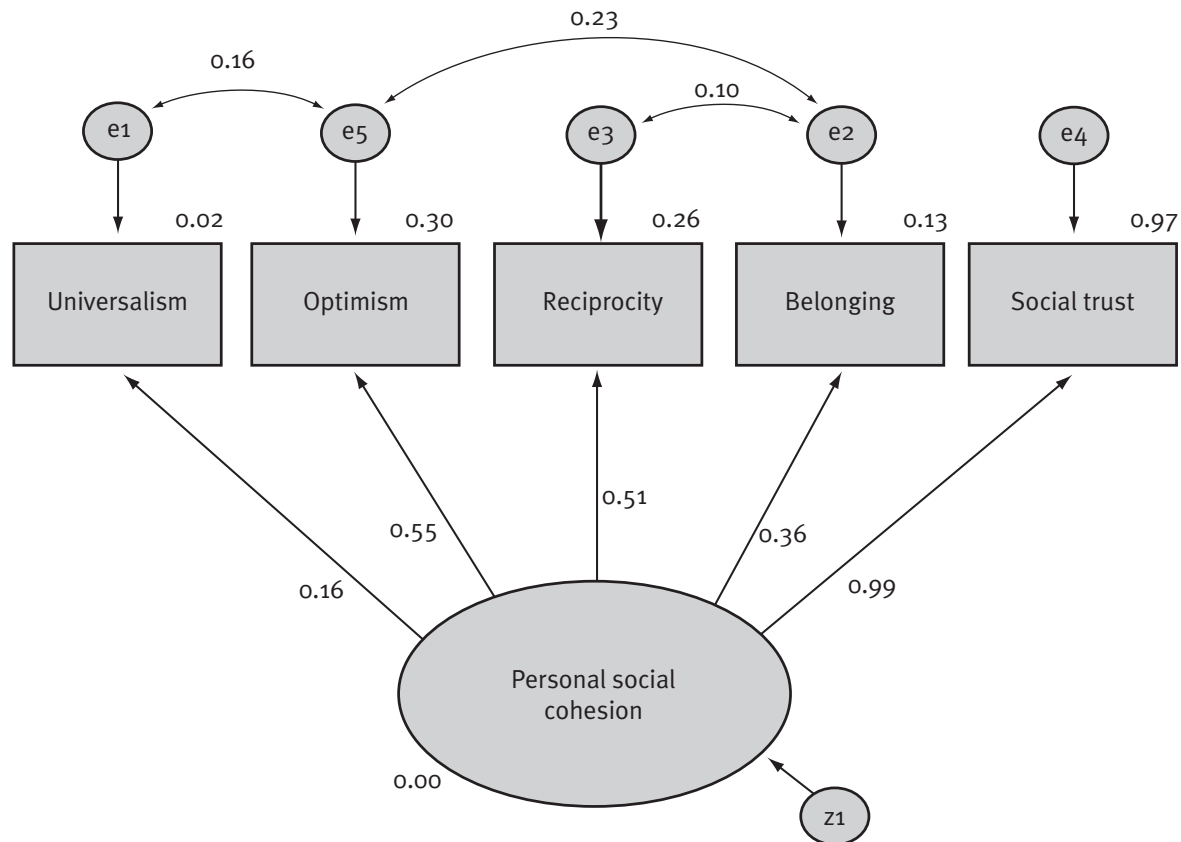
In the final model, the item with the largest weighting and that which best reflected the construct of community participation was enjoyment of participation. The latent factor, community participation, explained 85 per cent of variance in enjoyment, which dominated the latent construct. Breadth of participation and perceptions about participating too little also loaded strongly on the latent factor, with community participation explaining 20 per cent and 24 per cent of variance in those constructs respectively. Perceptions about participating too little or too much, and about not enjoying participating, loaded negatively on the latent factor indicating that community participation is about breadth of participation and enjoying participating. A final point to note is that the error term covariance that was required to fit the model was very large (standardised estimate=0.89), suggesting collinearity between enjoying participating and perceptions about participating too little. Given that the two constructs were not highly correlated ( $r=-0.15$ ,  $p<0.01$ , see Section 3), and are not semantically similar, the model was most likely not fully specified. This means that there was a missing part of the concept, an aspect of community participation that the one-factor congeneric model did not capture.

Further analyses (not reported here) were conducted to investigate this. A series of separate microstructural models were built to ascertain whether one of the other elements to be included in the final structural model would account for the error covariance in the participation one-factor congeneric model. Each micro model included the participation one-factor congeneric model together with one of the other variables to be included in the final structural model. Inspection of the magnitude of the error term covariance in the participation model within each of the micro structural models indicated that the addition of sense of belonging reduced the error term covariance to non-significance, suggesting that sense of belonging was the missing part of the concept.

### Personal social cohesion

This model includes five items as described in Section 2—universalism, optimism, reciprocity, sense of belonging and social trust (Figure 20).

Figure 20: Fitted one-factor congeneric model of personal social cohesion



All the fit indices, except for the adjusted goodness of fit index, suggested that the model did not fit the data well. Modification was undertaken to attempt a better fit. Acceptable item regression weights, squared multiple correlations and factor weights indicated that it was not appropriate to delete any items. The modification indices were inspected and indicated that three pairs of error terms could be covaried. Following this procedure, all indices showed that the model fit the data well. The parsimony index (the AIC) and the goodness of fit index that fit in the unmodified model showed improved fit in the modified model. Taken together, the indices showed that the modified model fit the data well. In the final model, the item with the largest weighting and that which best reflected the construct of personal social cohesion was social trust. The latent factor, personal social cohesion, explained 97 per cent of variance in social trust, which dominated the construct. Optimism and reciprocity also loaded strongly on the latent factor, with personal social cohesion explaining 30 per cent and 26 per cent of variance in those constructs respectively. Sense of belonging loaded significantly but less strongly on personal social cohesion, which explained a more modest 13 per cent of its variance. Universalism loaded significantly on personal social cohesion but, with explained variance of 2 per cent, was of little importance in defining the latent construct.

## 5.4 Evaluation of one-factor congeneric models

All four of the fitted models achieved a non-significant Chi-square statistic, indicating that the observed and reproduced matrices were not statistically different and that the models fitted the data well. This is an unusual result with such a large sample because the Chi-square statistic is very sensitive to sample size. Most unusually, one of the models fitted without modification. Model modification was undertaken for the remaining three models and all models were simply and successfully fitted. In all final fitted models, the absolute goodness-of-fit indices indicated that the models fit the data well, as did the incremental fit indices and the parsimony indices. Standard errors and critical ratios indicated that all retained parameter estimates were significant and were suitable for inclusion in the final models.

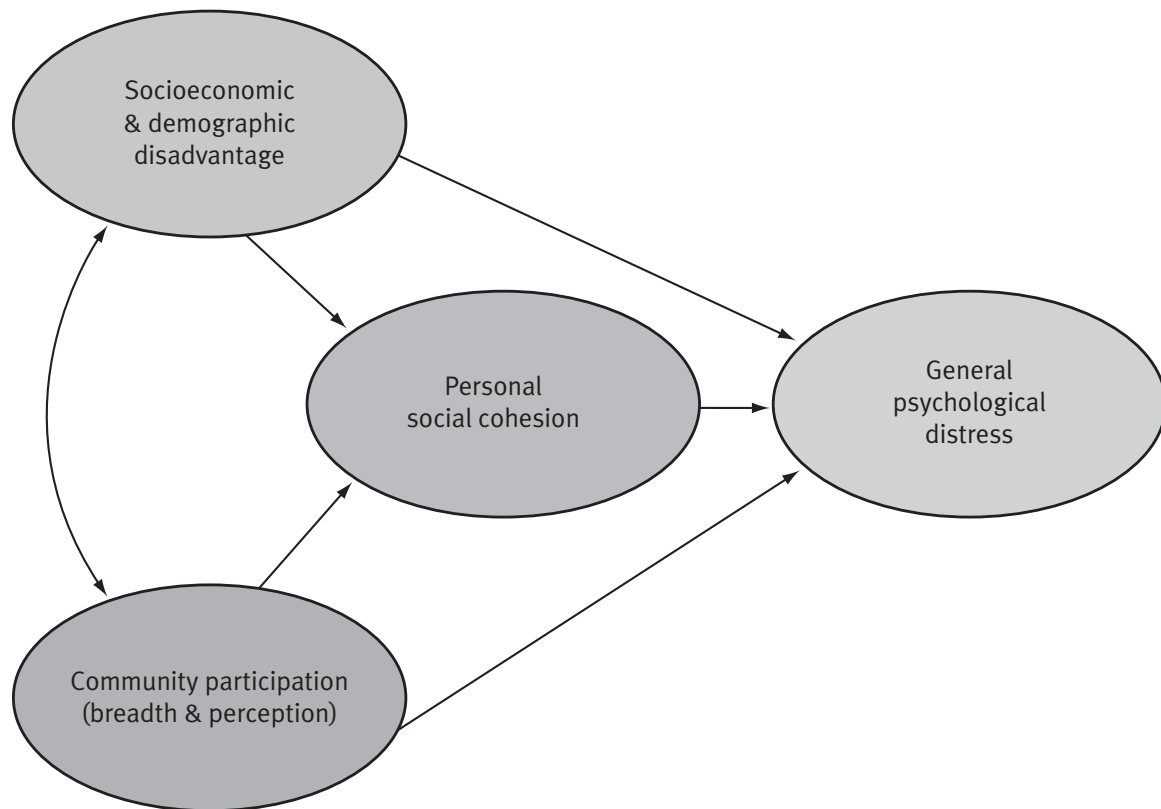
Item reliabilities, which were assessed by reference to the item squared multiple correlations, indicated acceptable item stability for all items and that the items were representative of the **same** latent construct. This means that the items could be combined to form composite scores that were valid measures of their latent construct, as was the purpose of the social trust model. Composite score reliability was confirmed by computing the Cronbach's  $\alpha$  reliability coefficient, which, at  $\alpha=0.81$ , indicated adequate reliability for the composite scale.

In sum, one-factor congeneric modelling provided strong support for the face validity (self-evident validity), construct validity (one-factor congeneric modelling is an alternative to analyses of convergent and discriminant validity) and content validity (representativeness of items) of social trust, socioeconomic disadvantage, community participation and personal social cohesion. These models could be confidently included in a larger structural model.

## 5.5 Personal social capital and psychological distress: building the structural model

To build the structural model, it was first necessary to build each of the components of the model—in this case, the three one-factor congeneric models as described above. The next step was to assemble the three one-factor congeneric models, together with the dependent variable (general psychological distress), according to social capital theory and the hypotheses of the study. This theory was outlined in Section 1, with Figure 1 reproduced here for convenience (as Figure 21 here).

Figure 21: Conceptual model of personal social capital and general psychological distress



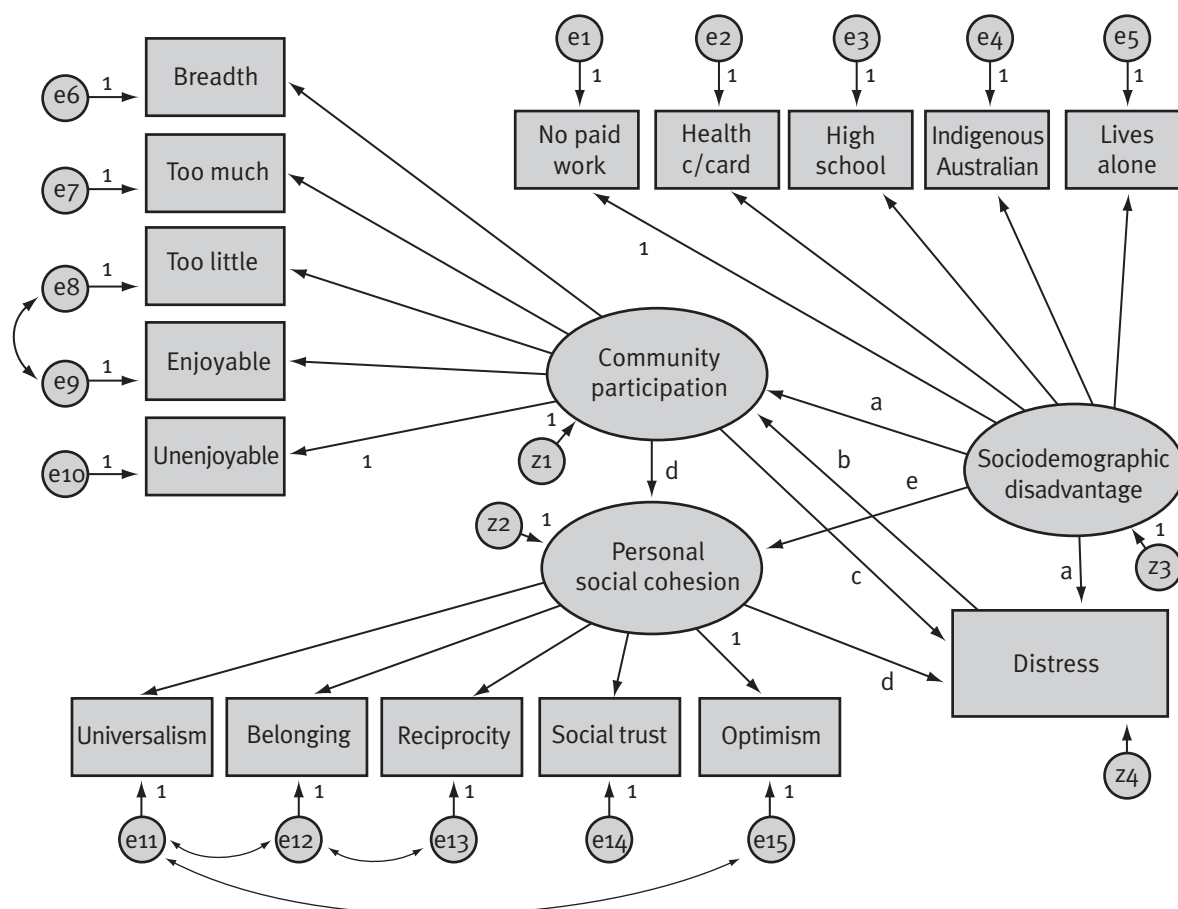
In review, the hypothetical model proposes that breadth of and perceptions about community participation are causally related to socioeconomic and demographic disadvantage with higher levels of disadvantage responsible for lower levels of participation. Together, they influence levels of personal social cohesion such that lower levels of disadvantage and higher levels of, and more positive perceptions about, participation are associated with higher levels of personal social cohesion.

Higher levels of personal social cohesion are, in turn, causally related to lower levels of general psychological distress. The hypothetical model also proposes that there are residual (direct) effects of disadvantage and participation on distress, such that disadvantage is directly related to higher levels of distress and participation to lower levels of distress, in addition to their mediated effects via cohesion.

### Hypothetical model: personal social capital and distress

The one-factor congeneric models were combined into a hypothetical structural model based on the conceptual model, as shown in Figure 22. Each of the latent concepts (fitted one-factor congeneric models of disadvantage, participation and cohesion) was included together with the observed variable distress. The latent concepts were linked by causal arrows showing possible hypothetical links between the concepts and distress.

Figure 22: Hypothetical structural model of personal social capital and general psychological distress



Box 2 describes the links among concepts in the hypothetical structural model. Hypotheses included were that:

- the link between participation and distress is spurious (caused by background factors that separately cause both participation and distress), arrows 'a'
- mental health problems cause low levels of participation (partly via 'social drift', see Section 1), arrow 'b'
- low levels of participation directly cause distress, arrow 'c'
- low levels of participation cause distress indirectly, because they cause low levels of cohesion (personal social capital hypothesis), arrows 'd'.

Arrow 'e' has not been directly investigated in previous research but is included for completeness: it is possible that disadvantage is directly independently causally associated with social cohesion such that more disadvantage is related to less cohesion taking account of any relationship to community participation.



**Box 2: Explanation key: hypothetical links between personal social capital and psychological distress**

- a Hypothesis: participation and mental health are not linked and background factors cause both separately. In this model, the background factors are five components of sociodemographic disadvantage.
- b Hypothesis: participation and mental health are linked with mental health problems causing lower levels of participation.
- c Hypothesis: the community causation hypothesis implicit in current epidemiological research, that community participation is protectively associated with the onset and course of mental health problems and helpful in recovery from them.
- d Hypothesis: the social capital community causation hypothesis, that community participation is protectively associated with the onset and course of mental health problems **because** participating in the community increases levels of personal social cohesion which, in turn, is causally associated with lower levels of mental health problems. This is a mediating hypothesis.
- e Hypothesis: no hypothesis. Association is being tested because it could be expected that there might be some residual (direct) relationship between sociodemographic disadvantage and personal social cohesion after taking account of the contributions to explaining variance made by all other factors in the model taken together.

**Fitting the hypothetical model**

The structural model was fitted using the same procedure as was used for fitting the one-factor congeneric models: the model was examined for non-significant items or pathways; the modification indices were inspected; the modified model was comprehensively re-evaluated; and the process repeated until model fit could or could not be achieved.

The procedure for fitting structural models is more complex than that required for fitting one-factor congeneric models because structural models are larger and more complicated. In particular: (i) the modification indices may suggest pathways that are not included in the hypothetical model but which would, if included, improve the fit of the model to the data; and (ii) as the model is modified, items and pathways which were significant initially may become non-significant, in turn potentially affecting the significance of existing items or pathways, or whole one-factor congeneric models that have been included in the structural model.

For this reason, each time an element of the model was modified, the modified model was re-inspected for new non-significant items or pathways prior to consideration of covarying error terms or adding new pathways. Consistent with the requirements of parsimony, deletion of non-significant items or pathways was given precedence over covarying error terms or adding new pathways. Fit statistics for the unfitted and fitted models are presented in Table 11.

**Table 11:** Summary of fit indices for structural equations model comparing the hypothesised model (Model A) and the fitted model (Model B) for personal social capital and distress

	Selected fit indices (absolute, incremental)	Acceptable values	Sample statistic		Meets criterion	
			Model A	Model B	Model A	Model B
(AIC: start=430.12; end=224.34)	CMIN	$p > 0.05$	345.119	112.34	×	✓
	CMIN/DF	1 to 2	3.613	1.40	×	✓
	RMSEA	$< 0.05 - 0.08$	0.05	0.02	✓	✓
	RMR	$< 0.05$	0.21	0.06	×	×
	GFI	$> 0.90$	1.00	1.00	✓	✓
	AGFI	$> 0.90$	1.00	1.00	✓	✓
	TLI	$> 0.90$	0.72	0.96	×	✓
	CFI	$> 0.95$	0.77	0.97	×	✓
	NFI	$> 0.90$	0.72	0.91	×	✓

Note: For explanation of acronyms, see Table 9.

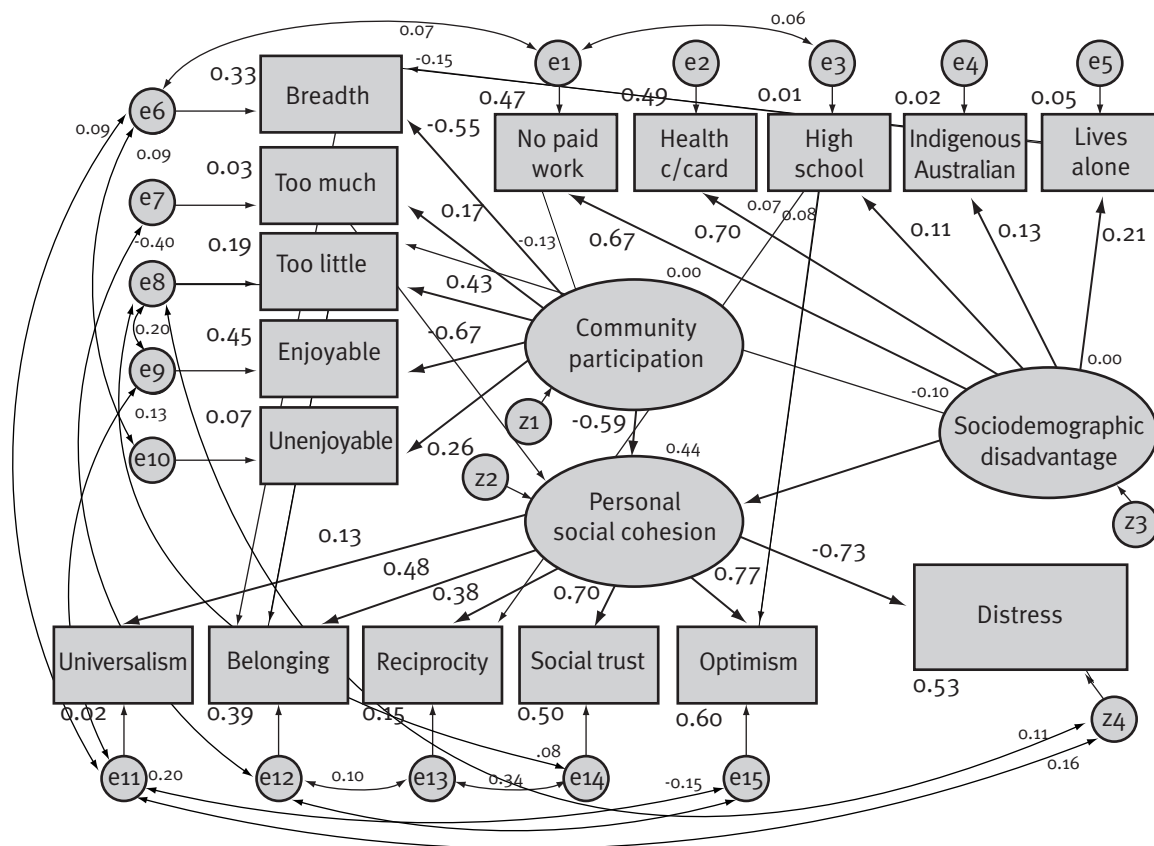
### Fitted structural model of personal social capital and psychological distress

In fitting the full structural model, the estimates obtained from the one-factor congeneric modelling were not fixed, but were allowed to be re-estimated to take simultaneous account of shared variance among all variables and also their simultaneous shared variance in distress.

#### Analysis of items and pathways

As Table 11 shows, overall, the fit indices suggested that the hypothesised model did not achieve an acceptable fit with the data. Modification was undertaken to attempt a better fit. Acceptable item regression weights, squared multiple correlations and factor weights indicated that it was not appropriate to delete any items at the outset. No non-significant items or concepts (one-factor congeneric models) were identified at any point during fitting of the structural model, and all remained in the final model. The fitted structural model is presented in Figure 23.

Figure 23: Fitted structural model of personal social capital and distress showing all significant pathways



A number of non-significant pathways were identified and deleted, one at a time, until no non-significant pathways remained. In the final model, the deleted pathways corresponded to pathways a, b and c in the hypothetical model shown in Figure 22. That is, when analysed simultaneously with the other pathways, there was no significant direct pathway either from sociodemographic disadvantage or from community participation to distress. This corresponds to the hypothesis that the link between participation and distress is spurious (pathways 'a'). There was no significant direct pathway from distress to participation, corresponding to the hypothesis that higher levels of distress are directly causally associated with lower levels of participation (pathway 'b'). There was also no significant direct pathway from participation to distress, corresponding to the hypothesis that higher levels of participation are directly causally associated with lower levels of distress (pathway 'c').

The pathways from community participation to distress via personal social cohesion, corresponding to the social capital hypothesis (pathway 'd'), were both significant, as was the direct pathway from disadvantage to distress (pathway 'e'). With a standardised regression weighting of -0.59, lower levels of negative community participation were strongly related to higher levels of personal social cohesion.

A standardised regression weighting of -0.73 indicated that higher levels of personal social cohesion were very strongly related to lower levels of general psychological distress. With a modest standardised regression weighting of -0.20, greater sociodemographic disadvantage was weakly related to **higher** levels of personal social cohesion.

#### Co-varying error terms and including missing pathways

Following deletion of non-significant pathways, the modification indices were inspected to assess the need to co-vary error terms or add pathways to the model, both of which were necessary. In total, 14 error terms

were co-varied and eight new pathways were added. Standardised error covariance estimates, which can be interpreted like correlation coefficients, were small, ranging from  $-0.15$  to  $0.34$ . An error covariance of  $0.34$  between reciprocity and trust indicated the possibility of some small aspect of the two concepts that the model did not quite capture. With trust well conceptualised and measured via 13 items, and reciprocity assessed by just one item, this modest covariance most likely resulted from poor conceptualisation and measurement of reciprocity. With only one term greater than  $10.201$ , and this most likely explained by a deficiency in the measure, the covariance estimates did not indicate misspecification of the model in terms of missing concepts. In the final model, the error term that had been of concern in the one-factor congeneric model of community participation (Figure 19) was reduced from  $0.89$  to a trivial final level of  $0.20$ .

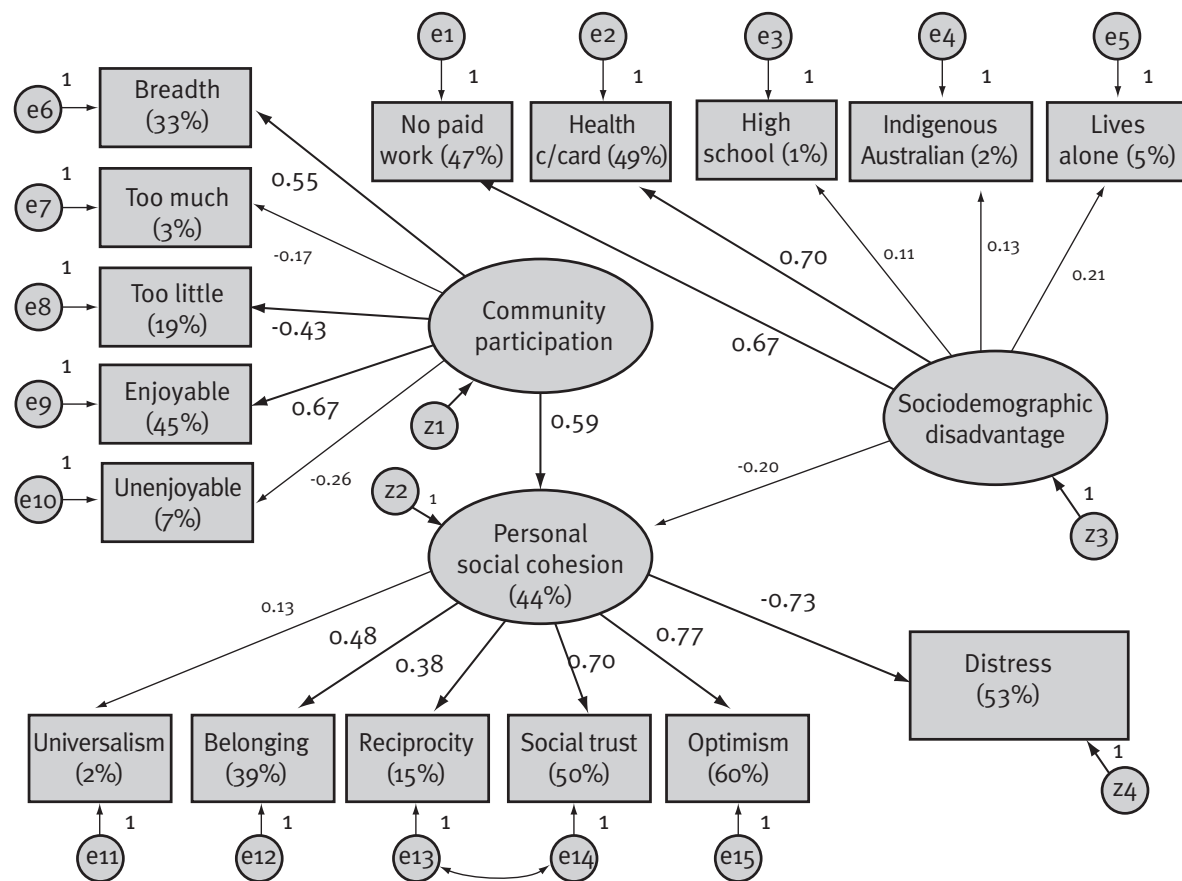
New pathways that were added to the model during fitting were consistent with the hypothesised pathways retained in the final fitted model. That is, they were consistent with pathways 'd' and 'e' in Figure 22. There was one minor exception. With a very small regression weighting of  $-0.08$ , higher levels of education were trivially related to lower levels of optimism. This barely reached significance and does not warrant comment.

Following all fitting procedures, all but one of the indices showed that the model fit the data, and the parsimony index (the AIC) was greatly reduced. Though the RMR did not quite meet the criterion, at  $0.06$  it was close to the criterion and greatly reduced from its starting point. As it is not the most important fit statistic, taken together, the indices showed that the modified model fit the data well.

## 5.6 Personal social capital and psychological distress: explaining the structural model

A simplified version of the final structural model of personal social capital and psychological distress is presented in Figure 24. This figure has been stripped of (i) all standardised error covariance terms that were less than  $10.201$  and (ii) all pathways whose standardised regression weightings were less than  $10.201$ . All significant standardised factor loadings have been retained in the final model, including those less than  $10.201$ .

Figure 24: Simplified fitted structural model of personal social capital and distress showing theoretically important pathways



The most important pathways in the model have been highlighted with darker arrows; the most important items in the one-factor congeneric model components of the structural model have been highlighted with darker colouring.

The sign of the estimate on the pathway linking community participation and personal social cohesion has been reversed for ease of presentation, as have the signs on the factor loadings for community participation. This does not affect interpretation of the model, but makes loadings and pathways more intuitive and therefore easier to explain. For example, it makes more sense to say that higher levels of community participation were associated with higher levels of personal social cohesion than it does to say that lower levels of negative community participation were associated with higher levels of personal social cohesion.

### Concepts in the final model: participation and cohesion

The full structural model takes account of all latent and observed variables (and their error and residual terms) simultaneously. As Figure 24 shows, the three predictor concepts in the model—sociodemographic disadvantage, community participation and personal social cohesion—were retained in the final fitted structural model. Items loading most heavily on the one-factor congeneric models within the structural model have been shaded more darkly than less important items. Heavier arrows linking items and concepts represent more important relationships than lighter arrows. Bold typeface also denotes stronger relationships.

It can be seen from the fitted model that the underlying structure of sociodemographic disadvantage was not changed: not being in paid work and poverty still dominated the construct, and weightings and explained variance remained much the same as in the one-factor congeneric model (see Figure 18). The structure of

community participation did change, however. In the one-factor congeneric model, the concept was heavily dominated by enjoyment of community participation (see Figure 19). Enjoyment remained the most important element of participation in the fitted structural model, but its standardised factor weighting was reduced from 0.92 in the original model to 0.67, with a commensurate reduction in explained variance from 85 per cent to 45 per cent.

The relative importance of participating too little remained much the same, while the relative importance of breadth of participation grew. Its factor weighting increased from 0.45 to 0.55, and explained variance from 20 per cent to 33 per cent. This suggests that, taking account of disadvantage and cohesion and their links to distress, **in terms of predicting distress**, community participation is best defined as being primarily about enjoying participating but also very much about participating broadly and not perceiving that one participates too little.

The underlying structure of personal social cohesion also changed in the structural model compared with the original one-factor congeneric model (Figure 20). In the original model, the concept of cohesion was heavily dominated by social trust. But in the full structural model, optimism dominated the concept of cohesion (with a regression weighting of 0.77 and explained variance of 60 per cent). Social trust came second (with estimates of 0.70 and 50 per cent respectively), while the importance of sense of belonging was greatly increased (its regression weighting from 0.36 to 0.48 and explained variance from 13 per cent to 39 per cent). Compared with the original model, in the structural model, reciprocity played a much reduced role in defining the construct of cohesion (its regression weighting fell from 0.51 to 0.38 and explained variance from 26 per cent to 15 per cent). The estimates for universalism remained much the same in both models. In the final structural model, personal social cohesion was best defined by optimism and social trust, with sense of belonging an important additional component. The final model explained 44 per cent of variance in personal social cohesion.

### **Pathways in the final model: the social capital hypothesis**

As Figure 24 shows, the pathway from community participation to distress via personal social cohesion—the social capital hypothesis pathway—dominated the structural model. Except for a weak direct pathway from sociodemographic disadvantage to personal social cohesion, no other pathway attained significance in the final structural model. In sum, the model indicated that participating in the community (enjoying participating, participating broadly, and not perceiving oneself to be participating too little) was strongly associated with elevated levels of personal social cohesion (hope for the future, trust in others and a sense of belonging). Social cohesion was in turn very strongly associated with lower levels of distress. In the final model, two concepts—community participation and personal social cohesion—with a small contribution from sociodemographic disadvantage, explained 53 per cent of variance in general psychological distress scores.

## 6 Summary and review of findings

### Section summary

This section summarises and critiques the main findings of the present study, addressing the research question and the aims of the study, and outlining the theoretical implications of the findings. Limitations of the study are presented and considered in terms of their theoretical and technical significance and of potential avenues of further research. Implications for policy and practice are discussed. The section ends with a summary of what may be concluded from the study.

### 6.1 Personal social capital and mental health: summary of study findings

The purpose of this research has been to advance knowledge and understanding about the relationship of social capital and mental health and thereby to articulate insights that are amenable to inclusion in public policy debate. To achieve this goal, we have described the relationship between breadth of community participation and perceptions about participation, investigated their shared relationship with general psychological distress, and examined the plausibility of the social capital hypothesis as an explanation for why participation is associated with distress. The research question for this project was:

Within a disadvantaged rural Australian population, how frequently do people participate in different domains of community activities, to what extent do they consider their participation adequate and enjoyable, and how are these factors related to their levels of personal social cohesion and their mental health?

The present study has addressed five specific aims. These were to evaluate the:

- extent to which people consider their levels of community participation to be adequate
- extent to which people enjoy participating in different types of community activity
- relationship between levels of community participation, and sense of adequacy and enjoyment of participation
- relationship between levels, adequacy and enjoyment of participation, and personal social cohesion (sense of belonging, trust, reciprocity, and optimism)
- relationship between levels, adequacy and enjoyment of participation, personal social cohesion, and mental health.

The findings of the present study are summarised below with respect to these five aims.

#### Do people think they participate enough?

With the exception of time spent taking an active interest in current affairs, giving money to charity, and socialising with household members, friends, and extended family, most people engage infrequently or rarely in most types of community participation (Berry, Rodgers & Dear 2007). Seven types of participation—taking an active interest in current affairs, socialising with household members, friends, extended family and neighbours, and getting involved in organised community activities and religious observance—were independently linked to better mental health. In the present study, using data from the *Eurobodalla Study* from which the above findings were obtained, we investigated whether respondents considered their levels of participation to represent too little or too much time spent engaging in these seven types of participation.

The large majority of respondents reported that they considered their levels of participation to be to some degree inadequate: more than four-fifths indicated that they engaged too little in at least one of the Big 7 types

of participation. In contrast, only around one in five respondents reported spending too much time engaging in one or more of these types of participation. Socialising with immediate household members was by far the most commonly endorsed type of overparticipation. Perceptions about engaging too little in the seven types of participation were not related to perceptions about participating too much, indicating that people could perceive themselves as simultaneously spending too little time in some types of participation and too much in others.

### **Do people enjoy participating in the community?**

With more than four in five respondents reporting particularly enjoying at least one type of community participation in which they engaged, it was clear the very large majority enjoyed at least some types of community participation. Around two-thirds particularly enjoyed two or more types. There was no type of participation that stood out as most commonly endorsed as enjoyable. However, attending religious services was about half as likely as any other type of participation to be nominated as particularly enjoyable.

Not enjoying participating was rare. Nearly 90 per cent of respondents reported that there were no types of participation that they found particularly unenjoyable. Among those that did, attending religious services was the most commonly endorsed unenjoyable activity. Enjoying and not enjoying participation were weakly negatively correlated reflecting a slight overall inclination towards either generally enjoying or generally not enjoying participating. People who reported that they particularly enjoyed some types of participation were slightly less likely than other respondents to report that they particularly did **not** enjoy some types of participation.

### **Is breadth of participation linked to people's perceptions about it?**

Enjoying participating was moderately positively associated with breadth of participation. This indicated that those who reported greater breadth of participation were, as might be expected, somewhat more likely than their peers to also report enjoying participating. With the exception of this one association, all other perceptions about participating were weakly related, or were not related, to breadth of participation. All associations were in the expected directions, such that greater breadth of participation was weakly related to less likelihood of reporting too little participation and to not enjoying participating. These findings suggest that breadth of participation is a different concept from perceptions about the adequacy and enjoyableness of participation: at the most, the concepts were only moderately statistically related.

### **Is community participation linked to social cohesion?**

We hypothesised that community participation and personal social cohesion would be positively associated such that those reporting higher levels of, and more favourable perceptions about, participation would also report higher levels of cohesion. We found higher levels of participation and favourable perceptions to be strongly related to higher levels of cohesion. Bivariate correlations between the participation indices and the components of social cohesion were, with one trivial exception, statistically significant. But they were generally weak. However, when participation and social cohesion were analysed as one-factor congeneric models and included in a structural equations model, participation—breadth and perceptions—was shown to be strongly related to social cohesion. The modelling found strong support for a pathway from participation to cohesion. Simultaneous testing of the reverse pathway delivered a non-significant regression estimate for the latter, lending sound empirical support for the proposition that participating in the social and civic life of the community increases levels of social cohesion.

### **Is personal social capital related to mental health?**

We have proposed that personal social capital is a form of social capital that is a property of the inherent personal characteristics and behaviours of individuals. It comprises their individual degree of breadth of community participation, their perceptions about their participation and their levels of personal social cohesion—universalistic values, sense of belonging, trust in others, generalised reciprocity, and hope for the future. In analysing the relationship between the components of personal social capital and general



psychological distress, we expected that community participation would not be directly predictive of distress but would have a mediated relationship with distress via personal social cohesion. We found robust support for this hypothesis.

We expected that breadth of participation and perceptions about participation would, in combination, be related to personal social cohesion. This proposition was strongly supported by the results of the structural modelling undertaken for this study. We further predicted that personal social cohesion would be negatively associated with general psychological distress such that those reporting higher levels of cohesion would report lower levels of distress. Consistent with potentially ‘universal’ findings (De Silva et al. 2007), in the present sample, we found higher levels of cohesion to be extremely strongly related to lower levels of distress, suggesting support for this proposition.

In all, our findings were robustly consistent with the social capital explanation for the link between community participation and psychological distress, and not supportive of the other hypotheses that we tested.

## 6.2 Advances in methods: conceptual insights

The methodological and technical aims of the present study were to contribute further to addressing problems of conceptualisation, operationalisation and measurement by:

- extending empirical investigation of community participation to include subjective perceptions
- further investigating social trust
- modelling personal social cohesion
- using structural equations modelling to examine linkages among these concepts and their associations with mental health.

Building on previous work on community participation by Berry, Rodgers and Dear (2007), we found that people’s thoughts and feelings about their levels and experiences of participating in the community added considerably to an overall understanding of the nature of community participation. The present study has also contributed to understanding the relationship between participation and social cohesion, and to explaining variance in distress scores.

Our further investigation of social trust, also building on previous work by Berry and colleagues (Berry & Rickwood 2000; Berry & Rodgers 2003), provided additional insight into the concept of trust and of how to measure it simply and accurately in large epidemiological surveys. For respondents in this study, believing that people were reliable (would keep their word and do what they said they would do) was the cornerstone of trusting others and the basis of a positive connection to other residents of the community.

Our modelling of personal social cohesion has provided insights into the concept itself, and into its relationship with distress. While social trust dominated the concept of cohesion when cohesion was investigated using one-factor congeneric modelling, when included in a structural model predicting distress, optimism played an equally strong role and sense of belonging was also important. By first clarifying the nature of cohesion, it was possible to define and describe it accurately. Including it, as a second step, in a structural model predicting distress permitted analysis of which aspects of cohesion are more important **in terms of distress**.

## 6.3 Theoretical implications of the study

Social capital research has been fraught with theoretical and methodological difficulties. Achieving advances in methodology, including in concept definition, terminology, operationalisation and measurement, are essential to achieving greater theoretical clarity (Whitley & McKenzie 2005). Using appropriate and sophisticated modelling techniques is also essential. By accomplishing such advances, this study has been

able to clarify and extend description of the nature of community participation, the nature of social trust, the nature of social cohesion and the relationships among these factors separately and in relation to distress. The study has also demonstrated the theoretical and statistical coherence of the concept of personal social capital, provided an example of how it might be modelled, and shown how it is related to distress.

It is not appropriate to make firm claims about causality, even implicitly (such as in Putnam's definition of social capital), when the kinds of research strategies that would be needed (such as longitudinal analyses, between groups experimental designs and case controlled studies) have not been employed. However, using (i) cross-sectional data from a purpose-designed study with a large sample and (ii) appropriate analytic techniques, it has been possible to comment on the plausibility of certain hypotheses.

In particular, the plausibility of the personal social capital explanation for the relationship between community participation and mental health has been clearly demonstrated, while one hypothesis may be discarded: it has been demonstrated that the link between participation and mental health is **not** spurious. Criticisms of the potential for social capital theory to contribute positively to advances in mental health research may also be discarded, with social capital offering a 'promising heuristic' for psychiatric epidemiology (Whitley & McKenzie 2005).

## 6.4 Limitations of the study

The following section discusses important limitations of the present study and their implications for theoretical, technical and policy advances.

### *Types of social capital*

Despite the advances made in this study, many theoretical and empirical questions about social capital and mental health are yet to be addressed. The present study has not engaged with aspects of social capital theory that relate to distinctions between bonding, bridging and linking social capital. Manuscripts in preparation, also using data from the *Eurobodalla Study*, examine the underlying structures and dimensions of community participation and will provide some perspective on these issues.

### *Causality*

As has been acknowledged above, there remains a need to address outstanding questions about causal relationships among components of the model and, especially, pathways to mental health outcomes. This would need to include the examination of different mental health disorders, as these may have different antecedents and consequences, and benefit most from different aspects of social capital (Whitley & McKenzie 2005). Causality cannot be conclusively demonstrated using cross-sectional data and it may now be timely to consider intervention trials (Jorm 2005). Nevertheless, appropriately analysed, as in this study, cross-sectional data are appropriately used for clarifying relevant factors and associations among these factors in terms of the epidemiology of social capital and mental health. Cross-sectional data are also of value in commenting on the plausibility or implausibility of different hypotheses. The findings of the present study will assist in the design of safe and effective social capital interventions, focused on broadly-based and enjoyable community participation. They will also help inform the design of future studies of social capital and mental health.

### *Participation and mental health: alternative explanations*

It is also necessary to consider alternative explanations for the empirical associations found between components of community participation and psychological distress. Other than the social capital hypothesis, two other explanations are plausible but cannot be tested in the current study. One is that people with mental health problems may be less responsive than their more healthy peers to the stress-buffering effects of participation (Phongsavan et al. 2006). There is some indicative evidence for this proposition. In an American study examining school dropout in the context of race and social capital, some groups were found to benefit

more from social capital than did others (Dunham & Wilson 2007). Whitely and McKenzie (2005) have argued, in a recent review of social capital and mental health, that those who are already at higher risk of mental health problems than their peers might be differentially and worse affected by 'isolation and alienation' (p. 76). Other authors have similarly noted that social capital might be a two-edged sword with respect to mental health (Almedom 2005).

An intervention study would be required to test a stress-buffering hypothesis. The mental health status of a group of people would need to be assessed prior to and after exposure to participation-raising activities. If the hypothesis is correct, the more serious the pre-existing mental health problems, the less benefit would be derived from the intervention.

The other explanation for the link between participation and distress is that a degree of community-level selection might operate in which more extroverted, social types move to neighbourhoods with higher stocks of social capital (Phongsavan et al. 2006). As mental health problems are negatively associated with extroversion and sociability,<sup>9</sup> high-participation neighbourhoods, with their lower concentration of people with mental health problems, might be happier places. There is evidence that personal characteristics influence place of residence. For example, 'similar' people tend to 'cluster' in the same neighbourhood (Drukker et al. 2003, p. 838), while people with serious mental health problems have different house-moving patterns from others (Dembling et al. 2002).

A community-level selection hypothesis might thus be valuable to test. This would require investigating firstly whether those who score higher on extroversion and sociability measures also report higher levels of participation and lower levels of mental health problems than their lower-scoring peers, and secondly whether, when they move house, they tend to move to neighbourhoods already high in community participation. With data on personality collected in Wave 5 of the HILDA survey and data on social capital in Wave 6, it would be possible to test the lagged effect of the former on the latter. As extroversion is a highly stable personality factor, over time, it would be possible to track whether extroverts self-select into high-participation neighbourhoods.

### *Other limitations*

There are well-recognised limitations associated with cross-sectional designs, particularly with respect to untangling cause and effect. Our use of the K10 measure of general psychological distress, which does not distinguish between the onset and course of distress, adds to this weakness. However, our aim was to investigate components of social capital, based on the most commonly used definition of social capital in epidemiology, and associations between these components and mental health, for which the use of cross-sectional data is appropriate. More significant limitations of the study are that self-report data have not been validated against more objective measures of participation and distress and that individual-level data have not been supplemented by ecological-level data. This means that we cannot, respectively, account for self-report bias in our results or for the relative contributions of individual levels of participation compared to ambient community levels to explaining distress.

This study focused on a socioeconomically disadvantaged rural Australian population and the types of participants identified might be particular not just to this sample, but to this type of population. While respondents wrote informative comments on their questionnaires, the lack of purposive qualitative data in this study limits understanding (Almedom 2005) of the barriers and facilitators to participation among lower participation groups, particularly those facing social exclusion. This understanding is essential to effective tailoring of services for poorly connected people (Lee, Draper & Lee 2001) and for people with intransigent problems (Juvonen-Posti et al. 2002; Quine et al. 2004).

In addition, due to the collection of extensive data on community participation in the *Eurobodalla Study*, space in the questionnaire was limited for collecting detailed data on sociodemographic characteristics and disadvantage. As there is considerable evidence linking deficits in social capital to disadvantage, future studies would need to examine the relationships between breadth of and perceptions about participation,

components of cohesion and aspects of disadvantage. Studies being undertaken using data from the HILDA survey will provide an opportunity to conduct more detailed investigation of the structure of disadvantage and its relationship to social capital. The large size and national representativeness of the HILDA survey will also permit investigation of a variety of subgroups within the population, which was also not possible using the *Eurobodalla Study* data.

## 6.5 Future research

Some directions for future research have been mentioned already. These are:

- examining the relationships between personal social capital and aspects of disadvantage
- investigating the relationship between extroversion and sociability, high-participation neighbourhoods and mental health
- testing whether a short version of the ACPQ survey measure of breadth of participation might be a reasonable proxy for extent and intensity of social networks (Section 2)
- examining the relationship between personal social capital and other mental health problems.

The first two of these may be investigated using the HILDA survey data. The third would require a dedicated, purpose-designed study. Detailed data on mental health being collected for Wave 7 of the HILDA survey will permit consideration of the fourth.

At a more general level, we have noted the need for longitudinal, intervention and, perhaps, case controlled studies to examine causal relationships and pathways. Further research is also needed in the area of concept development and measurement (Whitley & McKenzie 2005), including in Australia (Phongsavan et al. 2006). We have also noted that it will be necessary to conduct further research into components of social capital at the individual level, components that are attributes of communities, and the relationships between the two. Importantly, as ecological level measurement of social capital may be undertaken at a number of levels (neighbourhood, suburb, city, state, nation and global), considerable effort is still required to describe which non-individual components of social capital relate to which mental health problems and how.

Mental health might be considered a general indicator of ill-being or disease in an individual or a society. It certainly emerges quickly and acutely in response to negative life events (for a review, see Berry et al. 2007). In developing personal social capital theory, it would also be important to consider other indicators of ill-being, such as difficulties obtaining and retaining adequate levels of paid employment, problems with violence and contact with the criminal justice system, and chronic diseases, such as obesity. In addition, of particular value to policy development, associations between social capital and wellbeing, such as happiness, need to be investigated.

A new program of research into social capital, to be undertaken over the next three years using data from the HILDA survey, will include five studies designed to expand on the present research:

- Conceptualising and measuring social capital in the HILDA survey.
- Social capital and mental health in Australia: a multilevel analysis.
- Social capital, drought and mental health: can connectedness to community really ease the pain?
- Community participation, managing transitions out of paid work, and mental health.
- The urban environment and health: physical incivilities and substandard housing.

Each is a stand-alone study. The scientific objective of the program is to create a substantial, coherent body of new policy-relevant knowledge and information about Australian communities and mental health. Research in this area is urgently needed and has to date been insufficient.

## 6.6 Implications for policy and practice

The program of new research described above has been conceived to be directly applicable to FaHCSIA's overall vision of individual Australians thriving within a context of households that are thriving within communities that are themselves thriving. Separately and together, the studies are directly relevant to specific strategic themes and/or parts of the department. They build on previous work by Berry and colleagues, including the present study. In addressing certain major theoretical and methodological issues in research into social capital and mental health, the present study has shown that advances in the understanding of the concept can be achieved and that these can be interpreted in terms of their implications for policy and practice. It is essential in developing Australian social capital policy with respect to mental health to ensure the decision-making process builds on sound evidence (De Silva et al. 2005) in which concepts have been systematically defined and appropriately measured (Whitley & McKenzie 2005).

### **Not just any type of participation will do**

Because of its associations with increased social cohesion, encouraging participation in the community could be a safe and effective mental health promotion strategy. It is an appealing policy lever: it is relatively conceptually and practically straightforward, cheap, easy, quick, low risk (if appropriate types of participation are encouraged) and highly amenable to intervention. But not any type of participation will deliver policy goals, and some risk doing quite the opposite. The types of participation for which strategies could usefully be developed would include encouraging people, where possible and appropriate, to take an active interest in current affairs, to spend time socialising with members of the immediate household, friends, extended family and neighbours, and to get involved in organised community activities and religious observance. In addition, rather than encouraging very extensive involvement in just one or two of these types of participation, breadth of participation across as many of these types as possible would be more effective in achieving mental health and community benefits. It must be reiterated, however, that the focus must remain on personal agency and choice within an environment in which broad participation is facilitated and encouraged, without compliance demands.

### **Fun as a policy lever**

Even when appropriately targeted and delivered, encouraging breadth of participation across particular types is not sufficient alone. To derive mental health benefits from increasing levels and breadth of community participation, it is essential for participation to be perceived as enjoyable and sufficient. This is consistent with the proposition in another Australian study that people will not engage in social network activities that do not meet their needs (Phongsavan et al. 2006).

It would be counterproductive to encourage people to engage in types or levels of community participation that they perceive to be, respectively, unenjoyable or excessively demanding of their time. While unfavourable perceptions were not the most influential factors in predicting mental health outcomes in this study, they were nevertheless significant. More importantly, they shed light on issues that pertain to specific types of participation or to subgroups within the population. For example, perceptions about participating too much pertained primarily to one type of participation—socialising with members of the immediate household—which, when perceived to be excessive, was associated with higher levels of distress in both women and men. Perceptions about not enjoying participating pertained **only to men**, for whom this was a predictor of worse distress.

### **Tailoring social capital interventions**

Findings such as these suggest that women and men and, quite possibly, other groups within the community, might need different policy instruments when it comes to extracting mental health benefits from enhancing levels of community participation: while most people would benefit from higher levels of participation overall, from greater breadth of participation, and from enjoying their participation, pressure on people to do too much, or on men to do things they do not enjoy, could be counterproductive for mental health. In addition, social capital might have a harmful effect on mental health for some groups within the population (Almedom 2005), perhaps resulting from what are sometimes perceived as constraining requirements of following social norms (Whitley & McKenzie 2005). There is some indicative evidence for this proposition: as Berry, Rodgers and Dear (2007) found, some types of (political) participation were linked to **worse** mental health.

It is also important to bear in mind that mental health problems are not evenly dispersed in the population, with some groups disproportionately affected (De Silva et al. 2007).

## **6.7 Conclusion**

By systematically conceptualising, operationalising and measuring components of community participation and social cohesion, and by linking social capital theory with respect to mental health to its roots in early social psychiatry, the concept of personal social capital has been unpacked and clarified. Participating in the social and civic life of the community is important for mental health, primarily because of the increase in personal social cohesion with which it is associated. Previous research has found that not all types of participation are related to mental health, and that the strength and direction of association differs among those that are related.

Building on these findings, this study has confirmed the importance of breadth of community participation across specific types, and has also found that perceptions of participating too little are also important (negatively) for mental health. We have found that the most important aspect of community participation is enjoying participating. It contributed strongly to defining participation and, thus, to the association between participation and cohesion. Perceptions about participating too much, or of not enjoying it, were less important for social cohesion and, therefore, for mental health. But they were not insignificant, and have policy implications of their own.

### *Power of the social capital hypothesis*

In relating different aspects of community participation to personal social cohesion, and modelling putative pathways among various factors, the study found that the personal social capital hypothesis is a plausible explanation for the link between community participation and mental health; it was the only hypothesis for which this study found support. No support was found for the hypothesis that the link between participation and mental health is spurious, confounded by shared underlying factors.

There was also no support for the hypothesis that participation directly influences mental health, or that mental health problems are a barrier to participation. There is other evidence that supports the last two of these hypotheses, and this study fully acknowledges them. But when all hypotheses were considered simultaneously in a structural equations model, the social capital hypothesis clearly dominated, indicating its superior explanatory power.

### *Longing to belong*

There may be substance to the widely noted perception among Australians, echoed by our peers in other countries, that 'our sense of community is dying and that people no longer feel that they are part of a community' (Section 1, p. 2). Perhaps we really do have a deep longing to belong, to connect to each other and to acknowledge our need for each other in ways we feel we have somehow lost. If we do, something can be

done about it and, consequently, about the escalating rise in mental health problems and all that goes with it. But it would be unwise and potentially damaging to assume that an appropriate solution is simply to encourage greater involvement in any form of community participation. Instead, breadth of participation across specific types, with an emphasis on enjoyment, is an essential component of any policy platform.





# Appendix A: Early research linking community participation and mental health

## The seminal work of Elder and Leighton

Early longitudinal studies in psychiatric epidemiology described the social environment in which people lived, and linked facets of this environment with individual and group mental health outcomes via various risk factors. Examples of this kind of study can be found in the work of Elder and colleagues (Elder 1979, 1994; Elder & Caspi 1988; Elder, Van Nguyen & Caspi 1985) and Leighton and colleagues (Leighton 1965, 1994; Leighton et al. 1962). Both sets of studies were conducted in North America, Elder's in Berkeley, and Leighton's in Canada. Elder's participants were born in the 1920s, and constituted the first longitudinal cohort studies of children. Selected findings from these studies have been presented here as illustrations of how the social environment can influence mental health outcomes and, in particular, the role that community participation plays in this relationship.

## The Great Depression and mental health

Elder charted the effects of the Great Depression of the 1930s on the individual psychosocial development of two cohorts of children. The older cohort, born in 1920 to 1921, were adolescents during the Depression while the younger group, born in 1928 to 1929, were young children. These studies generated numerous interesting findings, including findings about some of the moderators and mediators of the relationship between the environment and mental health outcomes. Elder's findings with respect to the psychosocial development of study participants who were adolescents during the Depression (the earlier born cohort) are presented here as an example.

### Being a teenager in the Great Depression: good for boys, bad for girls

The experience of adolescent girls during the Great Depression was quite different from that of adolescent boys (Elder & Caspi 1988). Generally speaking, being an adolescent during the Depression was harmful to the psychosocial development of girls, but it was beneficial to that of boys.

In both cases, the harm and benefits resulted from the effect that poverty had on differences in the level and nature of community participation experienced by girls and boys.

### The effects of deprivation

Not all families experienced extreme financial adversity, which Elder called 'deprivation', during the Great Depression of the 1930s (deprivation is defined as living in a household that lost at least one-third of its pre-1930s wealth during the Great Depression—Elder 1979). But all households that did experience deprivation attempted to compensate for their loss by 'restructuring resources and relationships' in different ways (Elder & Caspi 1988). These restructurings, some of which delivered more successful outcomes than others, mediated the impact of economic adversity on members of the household system, leaving some harmed and some strengthened by the same adversity, even within the same household.

### *Bad news for girls*

Overall, girls fared badly because their deprivation meant they missed out on participating in desired ways in their community. Specifically, they missed out on socialising with their peers and meeting boys. Instead of having the time and the money to go out and have fun, they were not able to buy fashionable clothes and spent almost all their time at home performing little valued household chores, the quantity of which was greatly increased by their deprivation. Thus deprivation had the effect of pushing adolescent girls prematurely into adult roles, and these roles alienated them from their community. The end result of this chain of factors was elevated rates of mental health problems among deprived adolescent girls.

### *Good news for boys*

Boys' lives were also affected by household restructuring but, in their case, it led to increased community participation. Specifically, it led to early participation in the paid workforce. As soon as they were old enough, boys in deprived households would be expected to find paid work. As very young adolescents, they would perform simple tasks (such as running errands for neighbours), for which they would be paid small amounts. As they grew older they would progress to more responsible and more highly paid work. Unlike the girls' work, the boys' work took them out of the home, and it was greatly valued because it brought money into the house. As a result, working boys were granted premature access to the respect, freedoms, and privileges usually reserved for working men. So, Elder concluded, the boys 'were needed, and, in being needed, they had the chance and responsibility to make a real contribution to the welfare of others', which strengthened their sense of belonging (1974, p. 291). The end result of this chain of factors was lower than average rates of psychiatric morbidity among deprived adolescent boys.

As with their sisters, deprivation had the effect of pushing adolescent boys prematurely into adult roles. But in the boys' case, these roles connected them to their community, rather than alienating them from it. And so, while the girls' sense of self-worth tended to be undermined by their adult role-taking, that of the boys could be enhanced, and these contrasting life experiences were reflected in contrasting mental health outcomes at the time and throughout their lives.

### **Better to be born poor than to become poor**

Mediators and moderators of the impact of the social environment on individual mental health outcomes may be further explored by examining the circumstances of the adolescents more closely. For example, outcomes for girls were not uniform, and their experiences varied markedly depending on their particular circumstances. Elder and Caspi described two sets of circumstances (1988). Firstly, living in a family that sustained heavy financial losses during the Depression was a risk factor for the development of mental health problems among adolescent girls, but not equally among all girls. In terms of mental health outcomes, girls whose families were formerly financially comfortable responded to deprivation with elevated rates of mental health problems than did girls whose families were poor in the first place. Thus, deprivation was associated with the development of mental health problems for all adolescent girls, but it was associated with higher rates of morbidity for formerly financially comfortable girls.

### **Physical appearance: pivotal for girls' relationships with their fathers**

Secondly, both boys and girls felt the stress of hardship partly through the more negative behaviour of fathers in deprived families (Elder, Van Nguyen & Caspi 1985). For fathers, severe financial loss increased their 'emotional instability, tenseness, and explosiveness' making them more 'punitive and arbitrary'. Of particular note was the increased likelihood of fathers in deprived families behaving in a rejecting manner. While having a loving and supportive father was a protective factor against the development of symptoms of low self-esteem and serious psychological distress, having a rejecting father was a risk factor for these problems. In particular, the daughters of rejecting fathers were less goal-oriented, less socially capable, and felt more inadequate than the daughters of non-rejecting fathers. They were also less calm, more moody, and more easily hurt.

A girl's appearance was a factor in her likelihood of being rejected by her father, and thus in her likelihood of developing mental health problems. Elder had the girls' physical attractiveness rated by members of his team. He found that fathers were more likely to display rejecting behaviour towards their adolescent daughters if the daughters were not attractive. On the other hand, fathers of attractive daughters were more likely than average to behave in a supportive and nurturing manner, even if the family had suffered extreme financial adversity. These nurtured girls had lower rates of mental health problems than less supported girls, and both grew up to be more 'competent selves' (Elder 1979), even though they grew up in deprived families. Thus, fathers' rejection or support of their daughters was a mediator of the impact of deprivation on their daughters' mental health, and the daughters' attractiveness was a moderator of their fathers' rejection or support.

## World War II

Elder's findings about the immediate effects of deprivation and the Great Depression provide insight into the complex and interactive nature of the causal pathways associating factors in the social environment with mental health outcomes in individuals. The participants in his studies were followed into late middle age, with considerable evidence for extremely long-term effects of very early life experiences (Elder & Caspi 1988; Elder, Van Nguyen & Caspi 1985).

### Lagged and indirect effects of war on individuals

The long-term influence of the Second World War featured in Elder's findings particularly with respect to the impact of conscription. In following his two cohorts of Great Depression children into adulthood, he found certain experiences in early adulthood were central to determining positive outcomes in later adulthood for deprived boys. These included having a tertiary education, marrying and having children late, having a happy family life, enjoying work and, **especially**, doing military service (Elder 1979). The relative attractiveness of the military to deprived boys was evident in their retention rates. While all young men were required to perform military service, they were not required to continue on to military careers. There was a large difference in the proportion of young men from deprived backgrounds (60 per cent), compared to the proportion of their non-deprived peers (17 per cent), who chose to remain in military careers.

Military service appears to have offered young men from deprived backgrounds an escape from a painful and chaotic past into a structured and predictable world. In the military, deprived young men encountered substitute opportunities to develop the competent self that they did not have the opportunity to develop as children. Joining the military was also associated with other beneficial factors. For example, it tended to delay marriage and children, themselves predictors of long-term positive outcomes. It also offered specific opportunities, such as facilitating obtaining a tertiary education, because the military provided educational opportunities otherwise unavailable to deprived boys.

### Lagged and indirect effects of war on communities

Robert Putnam, many years later, conducted research looking at the effects of war on communities that delivered findings that were strongly consistent with the themes of Elder's findings. For example, during the American Civil War, civic engagement spiked: groups of women came together to make supplies such as bandages and clothing for soldiers. These groups eventually evolved into the American Red Cross (Putnam 2000). Political involvement registered an increase during the Vietnam War (Putnam 2000). Indeed, it has been proposed that wars have been the catalyst for the greatest boom in civic joining in America (Crowley & Skocpol 2001), with the Second World War leading to a particularly noteworthy boom in civic participation (Putnam 2000).

The effects of these experiences have endured a lifetime: the generation of people who were brought up before the end of the Second World War have remained unusually civic-minded throughout their lives (Putnam 2000) compared with those raised after the war (Putnam 2000).

Not only the ‘civic drought of the Great Depression’ (Putnam 2000, p. 16), but also the Second World War, appear to have shaped the values and behaviour of a whole generation of Americans, and led to quite different patterns of community participation than are found among younger generations.

## **Rebuilding after annihilation: the Stirling County studies**

A set of studies by Alexander Leighton and colleagues charted the transformation over some 20 years of the impoverished and marginalised inhabitants of a small rural slum in Canada, ‘The Road’, into an ‘integrated community’ as prosperous, happy and productive as any other in the region. From a pervasive culture of despondency, alienation, and self-destructive negativity, the people of The Road acquired the skills and motivation to take charge of their lives and of the development of their community (Leighton 1965).

### *Erosion of language, culture and economic opportunity*

Their descent into poverty and degradation appears to have originated from the erosion of their language and culture of origin, and from a comprehensive loss of economic opportunity. Prominent among the debilitating features of their degraded state were hostile mistrust of each other and especially of strangers, a lack of ability or desire to cooperate to solve problems, and ways of behaving and dressing that marked them as different from and undesirable to other people living in the surrounding region.

Specifically, Leighton found ‘broken homes, few and weak associations, inadequate leadership, few recreational activities, hostility and inadequate communication, as well as poverty, secularisation and cultural confusion’ (Leighton et al. 1962, p. 1021).

### **Rebuilding a community: from disgrace to dignity**

The people of The Road did not initiate their own recovery (Leighton 1965). Local government officials, prompted by Leighton and his team, decided to intervene to help the community. Their intervention included tangible and cultural resources based on three strategies. The first was to encourage residents to develop leadership skills in the hope that this would lead to the introduction of ‘social organisation’ and social values. The remaining two were education and economic opportunities. The process of change started with encouraging residents to cooperate to achieve one small goal, which was determined by the community itself. This goal was to raise enough money to introduce electricity into the schoolroom so that movies could be shown. The people were left to achieve this goal on their own and to do so they had to learn basic leadership and cooperation. Their goal was achieved, and enough extra cash was raised to pay for electricity for two years.

This first achievement became the template for the next, and so on, until the community became practiced at solving problems and cooperating to reach shared goals. Over time, future-oriented and public-spirited values emerged within the community, along with rising levels of formal and informal social participation. The Road was eventually able to integrate itself completely into its region, and this helped it progress more quickly.

### *Complex causal pathways*

In comparing The Road community with other communities in the same area, Leighton and colleagues found that the process of developing and of recovering from mental health problems was not identical in all communities (Leighton et al. 1962). For example, the risk of developing psychiatric problems was much greater for all people in disintegrated communities, regardless of social class. That is, people of lower socioeconomic status in integrated communities faced a much lower risk of developing psychiatric problems than higher status people in disintegrated communities. More detailed analysis of participants’ social networks revealed that belonging to a stable and well-integrated social group within the community reduced the risk of developing psychiatric problems compared with identifying with ‘non-conformists’. Thus, while economic, educational, and work status factors all had a separate bearing on rates of psychiatric problems, all of them

had to be taken together, along with other factors with which they were associated, to understand in a rounded way how a social environment could lead to the development of mental health problems.

### **Community participation builds healthy communities**

After following this community for nearly 20 years, Leighton concluded that the ability to work together to achieve collective goals was essential in overcoming the effects of poverty and degradation (Leighton 1994). To develop this ability, communities needed some initial assistance, including increased educational and economic opportunities. But more than that, they needed to acquire two essential skill groups. These were, firstly, the basic elements of ‘human relations’, to lead, to follow, and to cooperate. Second were the basic elements of self-management, confidence, optimism, and the ability to set and strive for practical goals. In a struggling community, these attributes could only be acquired in the context of learning through participating in the collective life of the community.

Leighton’s conclusions about what was required for a community to make a transition from falling apart to pulling together were strikingly similar to Elder’s essential criteria for a ‘competent self’. These criteria included being ‘goal-oriented’ (planned, optimistic, and determined), not being ‘submissive’ (helpless and resigned in the face of setbacks), and not exhibiting ‘self-inadequacy’ (failure to value oneself and to expect others to do the same) (Elder 1979). Both Leighton’s and Elder’s study participants learned their individual skills in a social environment, the former through community participation, and the latter in the home.

## **Concluding comments**

In both sets of studies, community and individual outcomes were greatly influenced by specific features of the social environment. This pertains to two propositions that have been central to the development of the present study. One is that the social environment, including levels of community participation and social cohesion, impacts considerably on outcomes for individuals as well as for whole communities. The second is that the pathways that lead from what goes on in the social environment to different individual mental health outcomes are complex and indirect. That is, there are many factors that influence mental health, they interact with each other in many ways, and the associations among them are often non-linear.



# Appendix B: Response rates and representativeness

## Encouraging participation in the study

Community involvement and a high response rate were sought for this study, but recent research indicates that response rates to mail surveys have been falling (Clark, Khan & Gupta 2001). Research into mail survey methodologies has indicated that response rates can be increased by informing potential participants that the research has university sponsorship, by pre-notifying potential participants by mail that they have been selected to take part in a study, by postcard follow-up after the questionnaire has been sent, and by using coloured paper for the questionnaire (Fox, Crask & Kim 1988). Fox, Crask and Kim (1988) also reported that using first-class outgoing postage increased response rates, while a New Zealand study indicated that there was no difference in response rates depending on whether the outgoing mail was stamped or franked (Brennan 1990).

A review of response rates achieved in 292 randomised control trials presents an analysis of 75 different ways of increasing response rates to mail surveys (Edwards et al. 2002). Though this review was published after data had been collected for the present study, its findings were consistent with those from earlier reviews reported above, and indicated that numerous strategies can be successfully employed to increase response rates to mail surveys in medical research.

### *Strategies employed*

In order to attempt to increase the response rate to the survey, prospective participants in this study were informed that a researcher from The Australian National University was conducting the study, they received a pre-notification letter and a reminder postcard, and the cover of the survey booklet was printed on coloured paper. Outgoing mail was franked, and a prepaid return envelope included in the package. In addition, shortly before questionnaires were mailed, the two local free newspapers and the two local pay papers published articles introducing the study, encouraging people to participate, and advising people of how they would be able to access its findings. The local radio stations, including the local youth station, also promoted the study via interviews and by reporting the study in the news. Media liaison, including the distribution of media releases, was initiated with the assistance of the Eurobodalla Shire Council. Journalists followed up on material in media releases directly with the chief investigator.

## Response rates

For mail surveys such as was conducted for this study, a response rate of around 20 per cent was expected (Clark, Khan & Gupta 2001), perhaps somewhat less since in this case there was limited follow-up, and the questionnaire was very long. Of 3,000 questionnaires that were mailed in the first round, 103 were undeliverable and returned to sender, and 858 were returned completed. This represents an initial response rate of 29.6 per cent (858/2,897), considerably in excess of expectations. Among Generation Xers, 18 per cent returned questionnaires (24.2 per cent of the women and 11.8 per cent of the men), while 33.1 per cent of Baby Boomers responded (43.0 per cent of the women and 23.3 per cent of the men). Men and women of the Long Civic (older) Generation responded in roughly equal numbers, with a response rate for this age group of 33.9 per cent. In total, 17.5 per cent of working-age men participated in the survey. Because of lower than expected response rates among working-age men (male Generation Xers and Baby Boomers), a second round of 1,200 questionnaires was mailed to working-age men to ensure adequate numbers in the final sample. Of these 1,200 working-age men, 9.9 per cent returned completed questionnaires (119/1,200). For budgetary reasons, we did not follow these men up with a reminder postcard. Due to an administrative error, it was not



possible to track how many questionnaires had been undeliverable, and this cannot therefore be factored into the response rate for the second round. In total, the overall gross, unadjusted response rate for both rounds was 23.8 per cent (977/4,097).

### *Undeliverable material*

Undeliverable material is a common problem in mail surveys using publicly available databases that are difficult to keep up-to-date (Harvey et al. 2003), such as the Australian electoral rolls. In Australia, it is the responsibility of individual citizens to keep their electoral roll details up-to-date, and variation can be expected in the consistency with which people do this. In addition, the names of people who have left the electoral district can remain on the electoral roll for some time after the person has left the district. The Australian Electoral Commission runs nationwide public awareness campaigns before each federal election to remind citizens of their responsibility to vote and to encourage them to register as voters. The electoral rolls are thus most accurate shortly before a federal election. The last federal election before data for this study were collected was held in October 1998, more than three years before data collection. In such circumstances, it is difficult to know how many packages may have failed to reach their intended recipients, but it can be assumed that the list of names and addresses for possible participants was not completely accurate.

There has been some research into the issue of the proportion of packages of study materials that do not reach the intended recipients. A recent Canadian study investigating the accuracy of public records of addresses found, after exhaustive searching using publicly available sources, that around 5 per cent of possible respondents in a mail survey were untraceable, and could not have received the study materials (Harvey et al. 2003). The authors proposed that the study response rate could be adjusted accordingly and still represent a conservative adjustment. The practice of adjusting response rates has been supported by other researchers who have investigated response rate issues (Asch, Jedrzejewski & Christakis 1997). In Australia, Mond and colleagues (Mond et al. 2004) reported that the proportion of mail survey materials that were undeliverable in a study conducted recently in the Australian Capital Territory was more than 11 per cent. Of relevance to the present study, this finding suggests that the proportion of undeliverable materials in Australia might currently be higher than that reported in the Canadian study. This would be particularly the case where electoral rolls may be out-of-date, as for the present study.

### *Adjusted response rate*

Should delivery failure rates of between 5 per cent and 11 per cent be applied to the present study, which was conducted in similar circumstances to the studies cited above, this would suggest that between 150 and 330 of the original 3,000 packages might not have reached their intended recipients. Based on these figures, an adjusted response rate for the first round of 3,000 participants would be between 30.1 per cent and 32.1 per cent, well above what was expected for this study. The unadjusted response rate for the whole sample, including both rounds of data collection, was 23.8 per cent. As we have indicated, this response rate is artificially low because the proportion of undeliverable materials has likely been substantially underestimated, and because data collection deliberately included heavy oversampling of working-age men among whom response rates were known to be low.

## **Representativeness**

Based on the sample provided by the Australian Electoral Commission, in 2001, when the data were collected, members of the Long Civic Generation comprised 43.9 per cent of the sample frame for the study. They comprised 35.1 per cent of respondents. Baby Boomers constituted 37.2 per cent of the sample frame, and comprised 37.8 per cent of respondents. Members of Generation X comprised 18.9 per cent of the sample frame, and 27.1 per cent of respondents. Thus, as intended in the sampling procedure, members of Generation X were overrepresented in the sample, and members of the Long Civic Generation underrepresented, compared with the distribution of age groups within the population of the shire.



### *High levels of Indigenous participation*

A proactive approach was taken to the recruitment of Indigenous Australians for this study by working with the Indigenous Australian liaison officer of the Eurobodalla Shire Council. Indigenous Australians represented 4.2 per cent of the population of the Eurobodalla Shire in 2001, and were 8.7 per cent of the sample. Thus, though there had been no oversampling of Indigenous Australians, they were represented in the study at about twice the rate that they were in the local communities of the shire.

### *Sample was representative*

Sample statistics on educational level were broadly consistent with population parameters for the region available from the Australian Bureau of Statistics Census data for 2001. In terms of education, the majority of respondents (n=483, 50.2 per cent) reported that they had completed high school or less. Exactly comparable data were not available. However, with 50 per cent of respondents educated no further than high school, this was not a highly educated sample, and this was consistent with Census data that indicated that substantially fewer residents of the shire had completed Year 12 than had done so on average in New South Wales.

With regard to when respondents participated in the study, there were no differences between those who participated in the study before the reminder postcard was sent, those who responded following the reminder postcard, and the new sample of men who participated as part of the second round of data collection. The three groups were compared using Chi-squared statistics with respect to level of education, paid work or study status, Indigenous status, being born overseas, having dependents, having a health care card, and living alone. All comparisons were between working-age men, since the second round of participants only included working-age men. The three groups did not differ significantly in terms of any of these sociodemographic factors.

### **Overall quality of response rate and data**

The completeness of the data returned was very strong, particularly given that the questionnaire was very long. Informal feedback from participants indicated that they did find the length of the questionnaire onerous, but that they found the questions interesting and the study worthwhile all the same.

It was not possible to determine the extent to which local media support influenced the completeness of the data participants' returned or their perceptions of the value of taking part in the study. However, much of the contact participants initiated with the chief investigator on the study resulted from them having read or heard of the study in the media. The difficulty of generating high response rates to mail surveys (especially to lengthy surveys), and of obtaining complete data from respondents, is well known. Involving the local media in encouraging participation in epidemiological studies might be an interesting factor to explore in future studies of this kind, particularly among sectors of the community that are hard to reach.



# Appendix C: Perceptions about community participation and associations with psychological distress

## Original articles: Peer review

## Perceptions about community participation and associations with psychological distress

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**Objective**

There has been no investigation of subjective perceptions about community participation and their links to mental health, despite the importance of perceptions in related constructs, such as social support. The aim of this study was to assess the relative importance to general psychological distress, compared to amount of participation, of subjective perceptions about sufficiency and enjoyment of participation.

**Method**

963 adults aged 18–97, living in a socio-economically disadvantaged coastal region of New South Wales, were randomly selected from the electoral rolls for Eden-Monaro to complete an anonymous mailed self-report questionnaire. Multiple hierarchical regression modelling assessed multivariate relationships among predictor variables, controlling for socio-demographic factors, and the Kessler 10-item measure of general psychological distress.

**Results**

Controlling for socio-demographic factors, subjective perceptions of participating too much or too little, of enjoying participating and, for men, of not enjoying participation, were all independently and more strongly related to distress than were frequency and breadth of participation.

**Conclusions**

Increasing levels of community participation may be an effective mental health promotion strategy. If so, interventions must ensure that levels of participation are sufficient, yet manageable within people's time constraints, and that types of participation being promoted are enjoyable and, for men, not unenjoyable.

Psychiatric disorders comprise at least 14% of global disease burden<sup>1</sup> and will constitute the second greatest burden of non-fatal disease by 2030.<sup>2</sup> Given the human,<sup>3</sup> social and economic,<sup>4</sup> costs of mental illness, cost-effective, preventative responses to addressing these problems are required. High levels of social capital, which comprises community participation and social cohesion, are related to better mental health for individuals and communities (for a review, see 5), perhaps partly because participation is related to social support.<sup>6</sup> Encouraging increased community participation has, for these reasons, been advocated as a mental health promotion strategy.<sup>7</sup>

While there has been extensive study of the amount of community participation with respect to mental health, subjective perceptions about participation, and their associations with mental health, have not been examined. These perceptions may be important in understanding the relationship between participation and mental health and, therefore, how best to design interventions. As subjective perceptions about social support are more strongly associated with mental health than is the amount of support,<sup>8</sup> subjective perceptions about community participation may be equally important in understanding the connection between participation and mental health. The aim of this study was to investigate this proposition.

**Methods****Participants and procedure**

Details of this study are given elsewhere.<sup>5,9,10</sup> Respondents were 963 residents of a disadvantaged rural region randomly sampled from the electoral roll for the federal seat of Eden-Monaro in southern coastal New South Wales, Australia, aged 19 to 97 years ( $M=52.76$ ,  $Sx=18.26$ ). Stratified sampling was used to recruit equal numbers of women ( $N=500$ , 51.9%) and men ( $N=463$ , 48.1%) voluntarily completing an anonymous self-report questionnaire (adjusted response rate=32%). With psychiatric morbidity prevalence around 24% nationally,<sup>11</sup> it was expected that a sample size of approximately  $N=1,000$  would yield a sample of at least  $N=200$  persons with moderate to severe distress, sufficient for the planned between-groups (sex) analyses. In fact,  $N>300$  respondents reported moderate to severe distress (details below). Analyses were performed using SPSS 15.0 for Windows. Approval to conduct this study was given by the Human Research Ethics Committee of The Australian National University (Protocol 2001/35).

## Measures

### Community participation

**Breadth of community participation.** Community participation was measured using the Australian Community Participation Questionnaire (ACPQ), as detailed in Berry et al.<sup>5</sup> The ACPQ contains 67 items tapping fourteen types of participation, with multiple items per type. Weighted mean scores for each type of participation were derived from one-factor congeneric models. In multiple regression analyses, controlling for socio-demographic factors, seven types of participation were found to be related to better mental health: contact with immediate household, extended family, friends and neighbours; organised community activities; religious observance; and taking an active interest in current affairs. An index of breadth of participation across these seven types was derived: each respondent was assigned a score of 1 (on or above the mean) or 0 (below the mean) for frequency of participation in each type. Scores were summed to give an 8-point index (possible range of 0–7). While associations between each type of participation and general psychological distress were weak, breadth of participation was strongly and linearly related to distress.

Perceptions about community participation included respondents' thoughts and feelings about their participation. The former were assessed by asking respondents' opinions about whether they took part sufficiently often in each type of participation and the latter by asking whether they enjoyed participating (see also 12). Perceptions measures were based on the same seven types of participation described above because, as for amount of participation, perceptions about these seven types, but not all fourteen types, were linearly related to distress.

**Sufficient time:** Respondents indicated on a five-point response format whether "the amount of time" they spent engaging in each type of participation was 1="much too much", 2="a bit too much", 3="about right", 4="a bit too little", and 5="much too little". There was no "does not apply to me" category as respondents could report, for example, never engaging in a type of participation and that this was "about right". Two scales were derived from the sufficient time items for each type of participation, one measuring the degree to which respondents reported spending too much time participating and one too little time. Responses for each type of participation were recoded so that scores ranged from 0 to 2. For the "too much time" measure, "much too much"=2, "a bit too much"=1, and all other scores were recoded to 0. For the "too little time" measure, "much too little"=2, "a bit too little"=1, and all other scores were recoded to 0. This delivered three-point scales of too much and too little time spent in each type of participation. In the same way as the breadth of participation index was calculated, two scales were derived from the sufficient time items: one calibrated too little time and one too much time spent participating across the seven types of participation that were linked to better mental health. Though data for some perceptions items were skewed, for all measures, splitting scores about the mean generated approximately the same cut-points as did splitting scores about the median.

**Enjoyment of community participation:** Respondents indicated on a five-point response format how much they enjoyed the time spent in each type of participation, where 1="very enjoyable", 2="enjoyable", 3="OK", 4="unenjoyable", 5="very unenjoyable". A "does not apply" response category was provided for types of participation in which respondents did not engage. The same procedure as was used to construct the too much and too little indices was used to create 8-point indices of enjoying and not enjoying community participation, and the final indices had a possible range of 0–7.

### Psychological distress

Mental health was assessed using a screening scale for symptoms of non-specific general psychological distress ("distress"), the Kessler 10-item scale (K10).<sup>13</sup> Each item was scored on a five-point scale from 1 = "none of the time" to 5 = "all of the time". Final summed scores had a possible range of 10 to 50 with higher scores indicating higher levels of distress. Scores in the present sample ranged from 10 to 44. Australian mean (M), median (Md) scores and morbidity rates have been reported for the K10 scale. They are, respectively, M=14.2, Md=12, with 68% of respondents scoring <15 (indicating little or no distress), 29% scoring 16–30 (moderate distress) and 3% scoring >30 (severe distress).<sup>14</sup> As is common for people living in disadvantaged rural locations, scores in the present sample revealed higher mean levels of distress than the Australian norms (M= 18.19, Md=17, standard deviation (Sx)=6.15) and higher morbidity rates (33%, 62% and 5% respectively). The scale exhibited satisfactory internal consistency (Cronbach alpha =.88).

### Socio-demographic data

Respondents reported their sex, age, Indigenous Australian status, years of education, responsibility for dependent persons (under and over 18 years), being in paid work at least six hours per week, living alone, and having a government benefit health care card. This is a proxy for poverty because, in Australia, health care cards are strictly means-tested.

### Statistical methods

Zero-order and partial correlations were computed to examine bivariate relationships between breadth of participation, perceptions and distress. Multiple hierarchical regression analyses were employed to test the relative contributions of breadth of participation and perceptions to explaining variance in psychological distress, controlling for socio-demographic factors.

## Results

Mean scores and standard deviations for breadth of and perceptions about community participation are presented in *Table 1*.

**Table 1. Mean scores (and standard deviations and p-values\*) of breadth of participation and perceptions of sufficiency and enjoyment by sex**

	Female		Male		Total		p
	M	SD	M	SD	M	SD	
Breadth of participation	3.86	1.57	3.32	1.60	3.60	1.61	<.001
Too much participation	.24	.54	.24	.55	.24	.54	.815
Too little participation	2.38	1.45	2.22	1.55	2.31	1.50	.099
Enjoyable participation	2.53	1.81	2.30	1.77	2.42	1.80	.049
Unenjoyable participation	.14	.50	.15	.45	.15	.48	.871

\* p-values derived from one-way analyses of variance. Higher scores indicate greater breadth of participation and greater agreement with perceptions statements (e.g., respondents attaining high scores on "too much" participation perceive that they participate too much to a greater extent than do lower-scoring respondents).

Women reported slightly and significantly greater breadth of participation than did men. There was little variance in scores for participating too much, with the large majority of respondents reporting that they did not participate too much in any type of participation. Of those who did, almost half reported spending too much time with members of their immediate household. Most respondents reported spending too little time engaging in at least one type of participation, mostly too little time with extended family, followed by friends, religious services and community activities.

There was little variance in scores for unenjoyable types of participation, with few respondents reporting types of participation that they found unenjoyable. Of those who did, not enjoying religious services was twice as commonly endorsed as any other type of participation. In contrast, most respondents reported enjoying at least one type of participation, with all types equally popular except for religious services, which was rated enjoyable half as often as were the other types of participation. Women were slightly but significantly more likely than were men to report enjoying participating.

### Breadth of participation and associations with perceptions

Pearson Product Moment Correlation coefficients between breadth of participation and the four indices of perceptions are presented in *Table 2*. Breadth of participation was not related to perceptions about participating too much, which was not related to perceptions about participating too little. Respondents could simultaneously report engaging too often in some types of participation and not often enough in others. Those who reported greater breadth of participation enjoyed participating more than those who participated less broadly, and also tended to report participating too little. In contrast, the lower respondents' breadth of participation, the more likely they were not to enjoy participating. Respondents who enjoyed participating tended to be satisfied with their levels of participation while those who identified types of participation they found unenjoyable tended to report that they participated too much or too little. They were also less likely to name any types of participation that they enjoyed.

**Table 2. Pearson product moment correlations between breadth of and perceptions about community participations and zero-order and partial correlations with general psychological distress, controlling for socio-economic factors and significant interaction terms**

	Pearson product moment correlations				r Distress	
	2	3	4	5	Zero-order	Partial
1. Breadth of participation	-.06	.24***	.40***	-.09**	-.25***	-.10**
2. Too much participation		.01	-.14***	.08*	.22***	.17***
3. Too little participation			-.15***	.07*	.23***	.23***
4. Enjoyable participation				-.21***	-.30***	-.18***
5. Unenjoyable participation					.13***	-.01

\* p <.05. \*\*p <.01, \*\*\*p <.001

Apart from a moderate correlation between breadth of participation and enjoying participating, all correlations were weak or non-significant. This suggests that the breadth and perceptions indices measured (mostly) related but separate constructs, and that the constructs were not collinear (confirmed by examining collinearity diagnostics derived from multiple regression modelling).

### Participation and distress

Pearson Product Moment Correlation coefficients for indices of participation and distress are presented in *Table 2*. All facets of participation were modestly and significantly related to distress. Greater breadth and enjoyment of participation were related to fewer symptoms of distress, while not enjoying participation and reporting too much or too little participation were related to greater distress. Partial correlations reflected the same pattern of associations except that the partial correlation between distress and not enjoying participating was non-significant.

Multivariate relationships between socio-demographic factors, breadth of participation and perceptions about participation and mental health were tested using a hierarchical multiple regression analysis predicting distress (*Table 3*). Socio-demographic factors were entered in the first step. These were sex, age, health care card status (poverty), Indigenous status, years of education, being in paid work, living alone, having dependent children and having adult dependents. The index of breadth of participation was entered in the second step. Indices of perceptions were entered in step three, with interaction terms between sex and breadth and perceptions about participation (for which there were some significant differences in means scores) entered in the final step. At each step, non-significant predictors of distress were deleted from the analysis, one at a time, starting with the predictor with the lowest beta value. After each deletion, the model was re-evaluated until only significant predictors remained.

Three of the socio-demographic characteristics retained independent significance in model 1, accounting for 6% of the variance in psychological distress. Increasing age and being in paid work were associated with lower psychological distress, while having a health care card was related to increased distress. These characteristics were retained in model 2, to which breadth of participation was added; it was independently associated with less distress. Together with the socio-demographic factors, which all retained significance, model 2 explained 11% of variance in distress. Indices of perceptions about participation were added in model 3 and, together with the other predictors, they explained 22% of variance in distress. Participating too much and too little were independently associated with greater distress, while enjoying participating was related to less distress. Not enjoying participation did not contribute independently to explaining variance in distress.

**Table 3. Multiple hierarchical regression analysis of socio-demographic factors, breadth of and perceptions about community participation as predictors of general psychological distress**

	B	Std Err B	$\beta$	p	R <sup>2</sup> (p)
<b>Model 1: Socio-demographic factors</b>					<b>.06 (&lt;.0001)</b>
Sex	.15	.39	.01	.704	
Age	-.09	.01	-.27	<.001	
In paid work	-1.62	.51	-.13	.002	
Health care card (poverty)	1.93	.45	.16	<.001	
<b>Model 2: Breadth of participation</b>					<b>.11 (&lt;.001)</b>
Sex	-.36	.39	-.03	.357	
Age	-.08	.01	-.23	<.001	
In paid work	-1.73	.50	-.14	.001	
Health care card (poverty)	1.64	.44	.13	<.001	
Breadth of participation	-.88	.12	-.23	<.001	
<b>Model 3: Perceptions about participation</b>					<b>.22 (&lt;.001)</b>
Sex	-.74	.39	-.01	.668	
Age	-.08	.01	-.17	<.001	
In paid work	-1.77	.49	-.15	<.001	
Health care card (poverty)	1.61	.43	.11	.001	
Breadth of participation	-.85	.12	-.10	.003	
Too much participation	1.79	.33	.16	<.001	
Too little participation	.86	.12	.22	<.001	
Enjoying participation	-.63	.11	-.18	<.001	
Not enjoying participation	-.18	.49	-.05	.068	
<b>Model 4: Interaction terms</b>					<b>.23 (&lt;.001)</b>
Sex	-.46	.38	-.04	.224	
Age	-.06	.01	-.17	<.001	
In paid work	-1.80	.47	-.15	<.001	
Health care card (poverty)	1.32	.41	.11	.001	
Breadth of participation	-.36	.12	-.10	.003	
Too much participation	1.79	.33	.16	<.001	
Too little participation	.86	.12	.21	<.001	
Enjoying participation	-.63	.11	-.18	<.001	
Not enjoying participation	-.18	.49	-.01	.708	
Sex X not enjoying participation	2.04	.74	-.11	.006	

Interaction terms between sex and breadth of and perceptions about participation were added in step four. Only the interaction between sex and not enjoying participating contributed significantly and independently to explaining variance in distress, adding a further 1% to explaining variance in distress scores. For women, not enjoying participation was unrelated to distress ( $r=.05$ ,  $p>.05$ , ns). But for men, not enjoying participation was modestly related to greater distress ( $r=.22$ ,  $p<.0001$ ). Because the interaction term between sex and not enjoying participating was significant, these two variables were retained in the model.

In the final model, in order of importance, not participating too little, enjoying participating, increasing age, not participating too much, being in paid work, not having a health care card, for men, not finding participation unenjoyable, and participating broadly in the community contributed independently to explaining 23% of variance in general psychological distress. Sex, being an Indigenous Australian, having child or adult dependents, living alone, years of education and, for women, not enjoying participation did not contribute independently to explaining variance in distress when considered in conjunction with the other variables.

## Discussion

The aim of this study was to investigate the proposition that subjective perceptions about community participation may be important in understanding the connection between participation and mental health. Consistent with expectations, breadth of participation, and perceptions about sufficiency and enjoyment of participation, were all related to distress. Those who participated broadly in their communities, and who enjoyed it, had fewer symptoms of distress, while those not enjoying participating and reporting too much or too little participation were more distressed. In multivariate analyses controlling for socio-demographic factors, subjective perceptions about sufficiency and enjoyment of participation each independently made a more substantial contribution to explaining variance in distress than did amount of participation. In order of importance, not participating too little, enjoying participation, not participating too much and, for men, not finding participation unenjoyable, were all more strongly related to distress than was breadth of participation.

Taking account of levels of and perceptions about participating in their communities, older people, those in paid work and those not experiencing poverty reported less distress than younger, unemployed and poorer people. Women reported participating in their communities slightly more than did men, and enjoyed it slightly more. Most people reported that they did not participate often enough, while few reported participating too often. Most also enjoyed at least one type of participation, while few identified any types of participation that they did not enjoy. Breadth of community participation was, at most, modestly related to subjective perceptions about sufficiency and enjoyment of participation. People who participated broadly in their communities tended to enjoy it and to want more (they reported not participating often enough). People who found participating unenjoyable were slightly more likely than their peers to express

dissatisfaction with their levels of participation, reporting that they participated too much or too little.

These findings are potentially important for understanding the onset, course and resolution of mental disorders: in a seventeen year prospective study of Norwegian adults, community participation was a stronger predictor of mortality than was social support.<sup>15</sup> If, like social support,<sup>16</sup> individuals' levels of community participation are stable over time, interventions that increased appropriate types of community participation might have substantial long-term positive effects on mental health.

## Limitations of this study

**Study location:** There is growing interest in Australia in the mental health of people living in rural and remote areas (e.g. 17). Rural Australians experience very high levels of disadvantage,<sup>18</sup> with disproportionate difficulty and expense in accessing health services (e.g. 19). For this reason, the present study focused on a socio-economically disadvantaged rural Australian population. However, its findings might not apply to metropolitan centres, or even to other rural locations. The findings of this study were, nevertheless, consistent with expectations. Paralleling the relationship between social support and mental health, perceptions about community participation were more strongly related to mental health than were levels of participation.

**Causality:** The use of cross-sectional data for this study precludes commenting on causal relationships among factors (though these have been demonstrated in longitudinal studies cited above). It may be that those who are distressed have a tendency to report negatively on their experiences.<sup>20</sup> Factors related to both participation and distress might, equally, explain higher distress among people with negative perceptions and lower levels of participation. For example, negative facets of personality might predispose people to psychiatric illness<sup>21</sup> and to difficulties in interpersonal interactions,<sup>22</sup> which are common among people with mental health problems (e.g. 23). The findings of the present study are nevertheless consistent with (i) prospective studies arguing that low social support<sup>24</sup> and isolation<sup>25</sup> are causal factors in the development of mental and other health problems, and (ii) studies worldwide describing the distress caused to people with mental disorders by the social isolation and, particularly, the rejection they suffer (e.g. 26).

**Subjective measurement:** There was little variance in scores for too much and unenjoyable participation, which could account for their modest associations with mental health. Refinement of the perceptions measures is required.

It could be argued that subjective measures are no substitute for objective measurement. But there is substantial evidence that individuals' perceptions are robust predictors of health outcomes. In a review of 27 community studies, perceived (self-rated) health consistently predicted mortality<sup>27</sup> while, in a longitudinal study of 229 middle-aged Americans, perceptions about neighbourhood mediated the relationship between objectively assessed neighbourhood characteristics and self-rated health.<sup>28</sup> Subjective perceptions about social support have been more strongly associated with mental health than has the objective quantum,<sup>8</sup> as have perceptions about social



support within intimate relationships. In two studies of the links between perceived and actual spousal support and distress among recipients of kidney transplants, negative perceptions about the quality of the spousal relationship resulted in higher levels of distress, but only in the presence of objectively rated unsupportive spousal behaviour.<sup>29</sup>

This raises an additional issue, which is that the relationship between perceptions about community participation and their links to mental health may vary across contexts and for different people. For example, social ties may be generally beneficial for mental health, but not when they involve role strain, as they may for many women.<sup>30</sup> This is consistent with the findings of the present study, in which finding community participation unenjoyable was associated with higher levels of distress, but only for men.

Mental health problems are so pervasive that clinical services cannot meet treatment needs. In Australia, one in five adults meets the criteria for a mental disorder each year<sup>31</sup> and, at most, one in six gets effective treatment.<sup>32</sup>

It has been proposed that strategies that encourage increased involvement in protective types of community participation could form an effective component of a broad-scale, socially-based mental health approach.<sup>5</sup> The present study indicates that perceptions matter too. For participation to be an effective mental health promotion intervention, it must be sufficient, yet manageable within people's time constraints, enjoyable and, for men, not unenjoyable.

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# Appendix D: Australian Community Participation Questionnaire (ACPQ) item development

## Description of the measure

Respondents' perceptions of how often they participated in various kinds of non-essential activity in the community were assessed using a measure specifically developed for this study. The measure comprised a total of 67 items. These were divided roughly evenly among three overarching dimensions of volitional community participation outlined in the manuscript. The measure contained 20 items tapping informal social connectedness, 22 items tapping civic engagement and 25 items tapping political participation. Within each of these were subsets of items intended to capture each of the hypothesised types of participation.

### *Informal social connectedness*

Within **informal social connectedness** were five types, each with four items. These were contact with household members, contact with extended family, contact with friends, contact with neighbours, and social contact with workmates. Household members were defined in the questionnaire as 'significant others who usually live with you' (for example, your partner, children, parents or other relatives). Extended family was defined as 'any relatives or significant others who **do not** live with you'. Neighbours, friends and workmates were not defined in the questionnaire.

### *Civic engagement*

Within **civic engagement** were five types of participation. These were organised community activities (four items), learning and education (four items), religious observance (four items), volunteering (three items), leadership in the voluntary sector (four items), and giving money to charity (three items). In the questionnaire, the definition of organised community activities included religious observance, and learning and education. They were defined as 'any activities you do in **organised groups** for fun, education, social contact, or worship—for example, sport (player, supporter, children's sport), Italian club, bushwalking, support groups, RSL, drama groups, railway society, choirs, reading circles and playgroups'.

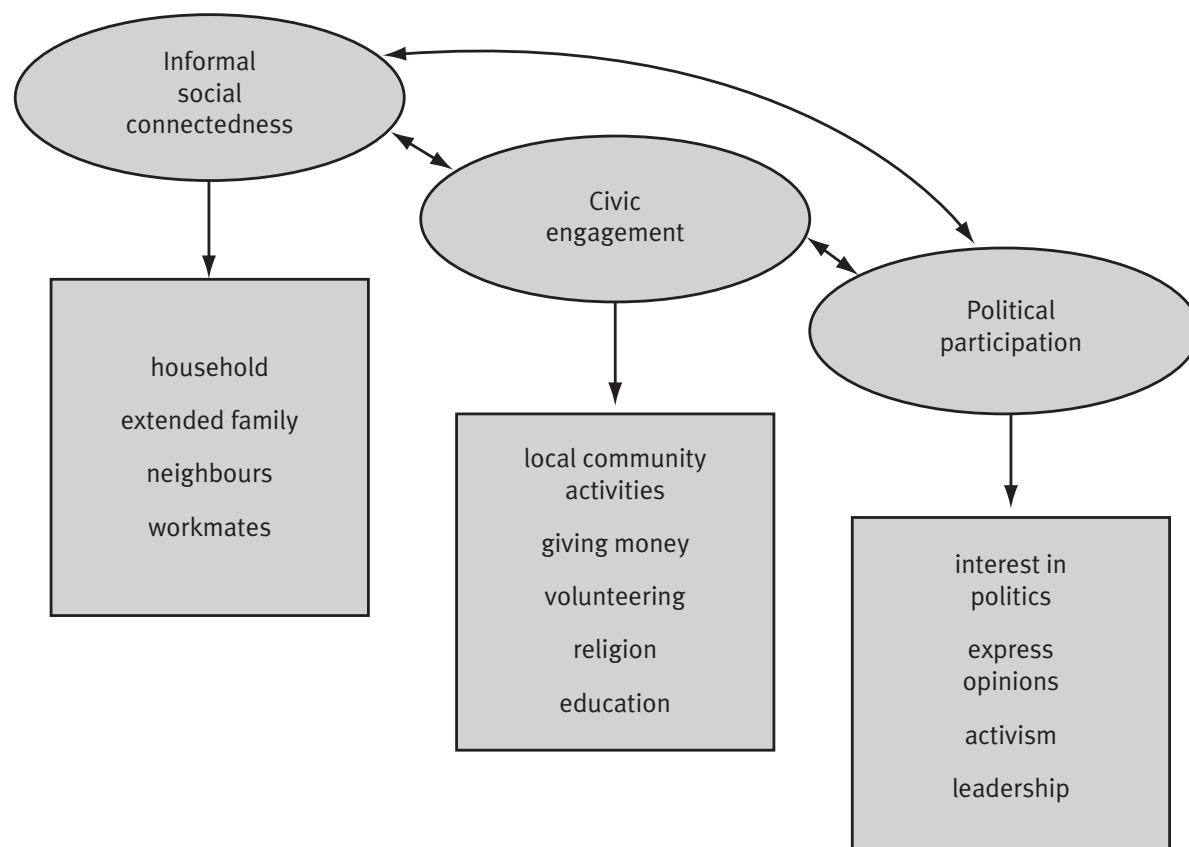
Volunteering, leadership in the voluntary sector, and giving money to charity were grouped in the questionnaire under the heading 'community service and volunteering'. It was defined as 'any kind of community work you do **without** being paid—for example, fundraising walks, Rotary, working bees, meals-on-wheels, selling raffle tickets, shopping for a sick neighbour, community boards, cooking sausages at a fete, Neighbourhood Watch, Red Cross'.

### *Political participation*

Finally, **political participation** contained five types of participation. These were interest in national and international affairs (four items), interest in local affairs (four items), expressing opinions (nine items), participating in political groups (four items), and organising political action (four items). These were grouped in the questionnaire under the heading 'keeping up with current affairs'. This was defined as 'knowing what's going on in the community and trying to help make a difference'. This could simply mean taking an interest in current affairs—or even being in a group involved in current affairs, like a union, political party, or a group that's for or against something (for example, reconciliation, commercial developments, gay rights, changes to taxes).

Figure D1 shows a conceptual model of the main dimensions of volitional community participation and types of participation that might be included within each, based on the literature review summarised in Berry, Rodgers and Dear (2007) and expanded in this appendix.

**Figure D1: Conceptual model of overarching dimensions of volitional community participation and types of participation within each dimension**



The three main areas of community participation are shown in the ellipses and are interrelated. In boxes below each ellipse are the types of participation included in each main area of participation. Questionnaire items were developed systematically for each type of participation in the boxes.

## Approach to development of the measure

Development of the measure of volitional community participation was theory-based. That is, decisions about what kinds of items to include, and how to measure them, were based on information and ideas available from previous research. Social capital research, on which much of the theory of this study was based, emphasises that the kinds of community participation that are important in building stocks of social capital are those that are non-essential, or non-obligatory. For this reason, only volitional kinds of participation were included in this measure. Thus, while participating in the paid workforce is a very important and common form of social participation, it was not included in this measure because most Australians of working age are not at liberty to choose not to engage in paid work. Activities such as shopping, obtaining medical services and using public transport were excluded for the same reason. That is, they are all ways of participating in society that most people are not free to avoid. Voting in elections, which is an important indicator of community participation in some countries, was also excluded because voting is compulsory in Australia.

While the measure excluded non-volitional types of participation, within this scope, the approach to item selection was inclusive. This is because in order to explore the true underlying structure of a complex construct (for example, via exploratory factor analyses), all relevant aspects of that construct have to be included in the analysis (Tabachnik & Fidell 2001). Such analyses are capable of identifying redundant items and, if appropriate, the items may be deleted later. It is therefore not problematic to include too many items, because redundant items can be identified and deleted, but it is problematic to include too few. As it was desirable to include more, rather than fewer, items in the instrument, all types of volitional community participation that could be identified were included.

### Item development

Items were constructed for each of the three overarching dimensions of participation: informal social connectedness, civic engagement and political participation. The structures of types of volitional community participation were to be tested, among other analyses, using one-factor congeneric modelling. The procedures involved in fitting these models require a minimum of three items, preferably four, for each measure being developed to avoid saturating the models, resulting in being unable to fit them. Therefore, where possible, at least four items were constructed tapping each type of participation.

Ideas for items were taken, where available, directly from published research. The most comprehensive listing of types of community participation is presented in Robert Putnam's (2000) seminal work *Bowling alone: the collapse and revival of American community*. This text was used as the basis for item development, extensively supplemented by targeted literature reviewing.

#### *Items for informal social connectedness*

For example, eating together is a key feature of informal social connectedness, so much so that Putnam (2000) mourns what he considers to be its decline. He refers with regret to an America which now prefers to 'grab a bite and run rather than sit a while and chat', (Putnam 2000, p. 102). Other research corroborates the importance of eating together (for example, Warde, Timpubolon & Savage 2005). Therefore, items about eating together were included among the items developed to measure contact with household members and contact with extended family. Another important part of informal social connectedness is 'schmoozing' (Putnam 2000). Schmoozing refers to having an active social life which is spontaneous and flexible (Putnam 2000). Typical activities are holding dinner parties, sending greeting cards, going to bars with friends and socialising with workmates out of hours. These kinds of activities were therefore reflected in items tapping contact with friends and social contact with workmates.

#### *Items for civic engagement*

The work of Robert Putnam is particularly strong around the topic of civic engagement, which describes the many kinds of associations that people form as they participate in organised aspects of community life (Putnam 1995). Specifically, civic engagement comprises three types of organised voluntary association (Putnam 1995; Putnam 2000). These are community-based (such as choirs and sporting clubs), church-based, and workplace or professional associations (such as trades unions). Also included in civic engagement were attending meetings and performing voluntary work (Putnam 2000). These themes were therefore also reflected in the items developed for civic engagement.

#### *Items for political participation*

In American, political participation, which can be broadly defined as expressing opinions and exercising rights (Putnam 2000), includes voting in elections. But working in local groups to address issues may now be a better indicator of political participation (Rich 1999), particularly in Australia where voting is compulsory and not therefore a sound indicator of political participation or activism. Other indicators of political participation were therefore developed, based primarily on Australian and New Zealand political science. They include following local, national or international affairs, writing letters to newspapers, helping manage political campaigns (as a

volunteer worker), signing petitions, making donations to causes or parties, and going on demonstrations. These were all included as separate items in the study.

An issue that emerged during the conduct of the literature reviews was that the boundaries between political participation and civic engagement were very unclear. An interesting possibility is that civic engagement is a pathway to political participation, a hypothesis that has been borne out in as yet unpublished analyses. Items tapping these two overarching dimensions were included without particular concern for where they might sit, with a view to investigating the higher order factor structure as part of the later analyses.

Where appropriate items were not found in published research, items were generated based on related ideas and on the principles outlined above.

### **Refining the items**

An initial set of 40 items was developed for pilot testing. The items were tested on two convenience samples totalling 40 respondents, with roughly equal numbers of women and men. The first sample included the staff and students of a research group, some of whom were familiar with the concept of social capital. The second sample was drawn from among employees of a public service work group. Following feedback on the items, several were simplified, or the wording clarified. The response format was also amended, and the number of items included was substantially increased to reflect numerous suggestions and further literature searching. Bivariate correlation coefficients were computed for the 40 items to evaluate whether a data set based on such items would be factorable, which it needed to be. With many significant moderate to large correlations among the items, even with a small pilot sample, it appeared that this requirement would be met. Feedback on a revised and larger set of 67 items was sought from another convenience sample, the staff and students of a different research group, and this resulted in a few small refinements to wording. The set of 67 refined items was then included in the questionnaire. A systematic assessment of the reliability and validity of this measure is summarised in the present report and in Berry, Rodgers and Dear (2007).

# Appendix E: Australian Community Participation Questionnaire (ACPQ)— fit statistics and list of questionnaire items

The following tables are presented:

**Table E1.** Summary of model fit statistics for one-factor congeneric models comparing the hypothesised model (Model A) and the fitted model (Model B) for 14 domains of community participation. This table summarises the overall fit of the models (statistics are presented in full in Table E2) for the hypothesised and fitted models for each domain of community participation, including the start and end values for the Akaike Information Criterion (AIC).

**Table E2.** This table presents in full the fit indices for all 14 types of community participation.

**Table E3.** This table lists all items retained in the final ACPQ as distributed among the 14 types of community participation, in order of importance, together with item weightings, squared multiple correlations and standardised regression weights.

Table E1: Summary of model fit statistics for one-factor congeneric models comparing the hypothesised model (Model A) and the fitted model (Model B) for 14 domains of community participation

Domain of community participation	Selected indices	Acceptable values	Sample statistic		Meets criterion	
			Model A	Model B	Model A	Model B
Contact with household members	Absolute fit				x	✓
	Incremental fit				✓	✓
	Item reliability	SMC>0.30–0.50	0.50–0.79	0.53–0.72	✓	✓
	Cronbach $\alpha$	>0.70 approx	–	0.96	–	✓
Contact with extended family	Absolute fit				✓	–, model fitted without modifying
	Incremental fit				✓	–, model fitted without modifying
	Item reliability	SMC>0.30–0.50	0.35–0.81	–	✓	–, model fitted without modifying
	Cronbach $\alpha$	>0.70 approx	0.86	–	✓	–, model fitted without modifying
Contact with friends	Absolute fit				x	✓
	Incremental fit				✓	✓
	Item reliability	SMC>0.30–0.50	0.38–0.74	0.33–0.75	x	✓
	Cronbach $\alpha$	>0.70 approx	–	0.85	–	✓
Contact with neighbours	Absolute fit				x	✓
	Incremental fit				x	✓
	Item reliability	SMC>0.30–0.50	0.65–0.89	0.58–0.93	✓	✓
	Cronbach $\alpha$	>0.70 approx	–	0.92	–	✓
Social contact with workmates	Absolute fit				✓	–, model fitted without modifying
	Incremental fit				✓	–, model fitted without modifying
	Item reliability	SMC>0.30–0.50	0.38–0.65	–	✓	–, model fitted without modifying
	Cronbach $\alpha$	>0.70 approx	0.88	–	✓	–, model fitted without modifying



Domain of community participation	Selected indices	Acceptable values	Sample statistic		Meets criterion	
			Model A	Model B	Model A	Model B
Ongoing informal learning	Absolute fit				x	✓
	Incremental fit				x	✓
	Item reliability	SMC>0.30–0.50	0.30–0.65	0.15–0.82	✓	x
	Cronbach $\alpha$	>0.70 approx	–	0.74	–	✓
Religious observance	Absolute fit				x	✓
	Incremental fit				x	✓
	Item reliability	SMC>0.30–0.50	0.15–0.74	0.12–0.77	x	x
	Cronbach $\alpha$	>0.70 approx	–	0.76	–	✓
Organised community activities	Absolute fit				✓	–, model fitted without modifying
	Incremental fit				✓	
	Item reliability	SMC>0.30–0.50	0.54–0.87	–	✓	
	Cronbach $\alpha$	>0.70 approx	0.90	–	✓	
Volunteering	Absolute fit				x	✓
	Incremental fit				✓	✓
	Item reliability	SMC>0.30–0.50	0.29–0.72	0.39–0.75	x	✓
	Cronbach $\alpha$	>0.70 approx	–	–	–	–
Leadership in the voluntary sector	Absolute fit		Model could not be fitted.			
	Incremental fit					
	Item reliability	SMC>0.30–0.50				
	Cronbach $\alpha$	>0.70 approx				
Giving money to charity	Absolute fit				?	?
	Incremental fit				?	?
	Item reliability	SMC>0.30–0.50	0.11–0.66	0.11–0.66	x	x
	Cronbach $\alpha$	>0.70 approx	–	0.64	–	x

Domain of community participation	Selected indices	Acceptable values	Sample statistic		Meets criterion	
			Model A	Model B	Model A	Model B
Active interest in current affairs	Absolute fit				x	✓
	Incremental fit				x	✓
	Item reliability	SMC>0.30–0.50	0.11–0.53	0.26–0.57	x	x
	Cronbach α	>0.70 approx	–	0.85	–	✓
Expressing opinions publicly	Absolute fit				?	?
	Incremental fit				?	?
	Item reliability	SMC>0.30–0.50	0.47–0.75	0.47–0.75	✓	✓
	Cronbach α	>0.70 approx	–	0.85	–	✓
Community activism	Absolute fit				x	✓
	Incremental fit				x	✓
	Item reliability	SMC>0.30–0.50	0.15–0.62	0.44–0.62	x	✓
	Cronbach α	>0.70 approx	–	0.88	–	✓
Voluntary sector activity	Absolute fit				x	✓
	Incremental fit				x	✓
	Item reliability	SMC>0.30–0.50	0.42–0.82	0.37–0.87	✓	✓
	Cronbach α	>0.70 approx	–	0.90	–	✓

Note: ‘–’=not applicable. ‘?’=cannot be computed (models with only two or three items cannot be fitted).  
SMC=Squared Multiple Correlation.

Table E2: Summary of fit indices for one-factor congeneric models comparing the hypothesised model (Model A) and the fitted model (Model B) for 14 domains of community participation

Domain of community participation	Selected indices	Acceptable values	Sample statistic		Meets criterion	
			Model A	Model B	Model A	Model B
Contact with household members (AIC: start=36.97; end=19.57)	CMIN	$p > 0.05$	0.00	0.21	x	✓
	CMIN/DF	1 to 2	10.40	1.57	x	✓
	RMSEA	$< 0.05 - 0.08$	0.10	0.02	x	✓
	RMR	$< 0.05$	0.01	0.00	✓	✓
	GFI	$> 0.90$	1.00	1.00	✓	✓
	AGFI	$> 0.90$	0.99	1.00	✓	✓
	TLI	$> 0.90$	0.91	0.99	✓	✓
	CFI	$> 0.95$	0.97	1.00	✓	✓
	NFI	$> 0.90$	0.97	1.00	✓	✓
	CMIN	$p > 0.05$	0.38	–, model fits without modification	✓	–, model fits without modification
Contact with extended family (AIC: start=17.93; end=n/a)	CMIN/DF	1 to 2	0.97	–, model fits without modification	✓	–, model fits without modification
	RMSEA	$< 0.05 - 0.08$	0.00	–, model fits without modification	✓	–, model fits without modification
	RMR	$< 0.05$	0.01	–, model fits without modification	✓	–, model fits without modification
	GFI	$> 0.90$	1.00	–, model fits without modification	✓	–, model fits without modification
	AGFI	$> 0.90$	0.99	–, model fits without modification	✓	–, model fits without modification
	TLI	$> 0.90$	1.00	–, model fits without modification	✓	–, model fits without modification
	CFI	$> 0.95$	1.00	–, model fits without modification	✓	–, model fits without modification
	NFI	$> 0.90$	1.00	–, model fits without modification	✓	–, model fits without modification
	CMIN	$p > 0.05$	0.38	–, model fits without modification	✓	–, model fits without modification
	CMIN/DF	1 to 2	0.97	–, model fits without modification	✓	–, model fits without modification

Domain of community participation	Selected indices	Acceptable values	Sample statistic		Meets criterion	
			Model A	Model B	Model A	Model B
Contact with friends (AIC: start=36.39; end=25.04)	CMIN	$p > 0.05$	0.00	0.01	x	x
	CMIN/DF	1 to 2	10.19	7.04	x	x
	RMSEA	$< 0.05 - 0.08$	0.10	0.08	x	✓
	RMR	$< 0.05$	0.02	0.01	✓	✓
	GFI	$> 0.90$	0.99	1.00	✓	✓
	AGFI	$> 0.90$	0.95	0.96	✓	✓
	TLI	$> 0.90$	0.88	0.93	x	✓
	CFI	$> 0.95$	0.96	0.99	✓	✓
Contact with neighbours (AIC: start=60.89; end=25.22)	NFI	$> 0.90$	0.96	0.99	✓	✓
	CMIN	$p > 0.05$	0.00	0.01	x	x
	CMIN/DF	1 to 2	22.44	7.22	x	x
	RMSEA	$< 0.05 - 0.08$	0.15	0.08	x	✓
	RMR	$< 0.05$	0.03	0.01	✓	✓
	GFI	$> 0.90$	0.97	1.00	✓	✓
	AGFI	$> 0.90$	0.86	0.96	x	✓
	TLI	$> 0.90$	0.83	0.95	x	✓
	CFI	$> 0.95$	0.94	0.99	x	✓
	NFI	$> 0.90$	0.94	0.99	✓	✓

Domain of community participation	Selected indices	Acceptable values	Sample statistic		Meets criterion	
			Model A	Model B	Model A	Model B
Social contact with workmates (AIC: start=25.47; end=n/a)	CMIN	$p > 0.05$	0.01	—, model fits without modification	x	—, model fits without modification
	CMIN/DF	1 to 2	4.74	—, model fits without modification	x	—, model fits without modification
	RMSEA	$< 0.05$ – $0.08$	0.06	—, model fits without modification	✓	—, model fits without modification
	RMR	$< 0.05$	0.00	—, model fits without modification	✓	—, model fits without modification
	GFI	$> 0.90$	0.99	—, model fits without modification	✓	—, model fits without modification
	AGFI	$> 0.90$	0.96	—, model fits without modification	✓	—, model fits without modification
	TLI	$> 0.90$	0.91	—, model fits without modification	✓	—, model fits without modification
	CFI	$> 0.95$	0.97	—, model fits without modification	✓	—, model fits without modification
	NFI	$> 0.90$	0.97	—, model fits without modification	✓	—, model fits without modification
	CMIN	$p > 0.05$	0.00	0.94	x	✓
Ongoing informal learning (AIC: start=72.14; end=18.01)	CMIN/DF	1 to 2	28.07	0.01	x	✓
	RMSEA	$< 0.05$ – $0.08$	0.17	0.00	x	✓
	RMR	$< 0.05$	0.16	0.00	x	✓
	GFI	$> 0.90$	0.93	1.00	✓	✓
	AGFI	$> 0.90$	0.65	1.00	x	✓
	TLI	$> 0.90$	0.22	1.03	x	✓
	CFI	$> 0.95$	0.74	1.00	x	✓
	NFI	$> 0.90$	0.74	1.00	x	✓
	CMIN	$p > 0.05$	0.00	0.94	x	✓
	CMIN/DF	1 to 2	28.07	0.01	x	✓

Domain of community participation	Selected indices	Acceptable values	Sample statistic		Meets criterion	
			Model A	Model B	Model A	Model B
Religious observance (AIC: start=38.85; end=19.35)	CMIN	$p > 0.05$	0.00	0.25	x	✓
	CMIN/DF	1 to 2	11.42	1.35	x	✓
	RMSEA	$< 0.05 - 0.08$	0.10	0.02	x	✓
	RMR	$< 0.05$	0.01	0.00	✓	✓
	GFI	$> 0.90$	1.00	1.00	✓	✓
	AGFI	$> 0.90$	0.98	1.00	✓	✓
	TLI	$> 0.90$	0.81	0.99	x	✓
	CFI	$> 0.95$	0.94	1.00	x	✓
Organised community activities (AIC: start=18.83; end=n/a)	NFI	$> 0.90$	0.93	1.00	✓	✓
	CMIN	$p > 0.05$	0.24	–, model fits without modification	✓	–, model fits without modification
	CMIN/DF	1 to 2	1.41	–, model fits without modification	✓	–, model fits without modification
	RMSEA	$< 0.05 - 0.08$	0.02	–, model fits without modification	✓	–, model fits without modification
	RMR	$< 0.05$	0.01	–, model fits without modification	✓	–, model fits without modification
	GFI	$> 0.90$	1.00	–, model fits without modification	✓	–, model fits without modification
	AGFI	$> 0.90$	1.00	–, model fits without modification	✓	–, model fits without modification
	TLI	$> 0.90$	1.00	–, model fits without modification	✓	–, model fits without modification
	CFI	$> 0.95$	1.00	–, model fits without modification	✓	–, model fits without modification
	NFI	$> 0.90$	1.00	–, model fits without modification	✓	–, model fits without modification

Domain of community participation	Selected indices	Acceptable values	Sample statistic		Meets criterion	
			Model A	Model B	Model A	Model B
Volunteering (AIC: start=118.01; end=25.45)	CMIN	$p > 0.05$	0.00	0.70	x	✓
	CMIN/DF	1 to 2	10.44	0.48	x	✓
	RMSEA	$< 0.05 - 0.08$	0.10	0.00	x	✓
	RMR	$< 0.05$	0.02	0.00	✓	✓
	GFI	$> 0.90$	0.97	1.00	✓	✓
Leadership in the voluntary sector (AIC: n/a) Note: model unidentified and could not be estimated. Items included in 'volunteering' domain, renamed 'voluntary sector activity'	AGFI	$> 0.90$	0.92	1.00	✓	✓
	TLI	$> 0.90$	0.95	1.00	✓	✓
	CFI	$> 0.95$	0.97	1.00	✓	✓
	NFI	$> 0.90$	0.97	1.00	✓	✓
	CMIN	$p > 0.05$	Cannot be reported: model could not be estimated			
	CMIN/DF	1 to 2				
	RMSEA	$< 0.05 - 0.08$				
	RMR	$< 0.05$				
	GFI	$> 0.90$				
	AGFI	$> 0.90$				
	TLI	$> 0.90$				
	CFI	$> 0.95$				
	NFI	$> 0.90$				

Domain of community participation	Selected indices	Acceptable values	Sample statistic		Meets criterion	
			Model A	Model B	Model A	Model B
Giving money to charity (AIC: n/a) Note: Model saturated; fit indices cannot be reported	CMIN	$p > 0.05$	→ model saturated			
	CMIN/DF	1 to 2				
	RMSEA	$< 0.05 - 0.08$				
	RMR	$< 0.05$				
	GFI	$> 0.90$				
	AGFI	$> 0.90$				
Active interest in current affairs (AIC: start=619.62; end=65.36)	TLI	$> 0.90$				
	CFI	$> 0.95$				
	NFI	$> 0.90$				
	CMIN	$p > 0.05$	0.00	0.17	x	✓
	CMIN/DF	1 to 2	16.56	1.40	x	✓
	RMSEA	$< 0.05 - 0.08$	0.13	0.02	x	✓
	RMR	$< 0.05$	0.06	0.02	x	✓
	GFI	$> 0.90$	0.89	0.99	x	✓
	AGFI	$> 0.90$	0.83	0.98	x	✓
	TLI	$> 0.90$	0.79	0.98	x	✓
	CFI	$> 0.95$	0.84	0.99	x	✓
	NFI	$> 0.90$	0.83	0.98	x	✓



Domain of community participation	Selected indices	Acceptable values	Sample statistic		Meets criterion	
			Model A	Model B	Model A	Model B
Expressing opinions publicly (AIC: n/a) Note: Model saturated; fit indices cannot be reported	CMIN	$p > 0.05$	–, model saturated			
	CMIN/DF	1 to 2				
	RMSEA	$< 0.05$ – $0.08$				
	RMR	$< 0.05$				
	GFI	$> 0.90$				
	AGFI	$> 0.90$				
	TLI	$> 0.90$				
Community activism (AIC: start=632.67; end=31.36)	CFI	$> 0.95$				
	NFI	$> 0.90$				
	CMIN	$p > 0.05$	0.00	0.85	x	✓
	CMIN/DF	1 to 2	13.38	0.48	x	✓
	RMSEA	$< 0.05$ – $0.08$	0.11	0.00	x	✓
	RMR	$< 0.05$	0.06	0.02	x	✓
	GFI	$> 0.90$	0.89	0.98	x	✓
	AGFI	$> 0.90$	0.84	0.95	x	✓
	TLI	$> 0.90$	0.84	1.12	x	✓
	CFI	$> 0.95$	0.87	1.00	x	✓
	NFI	$> 0.90$	0.87	0.96	x	✓

Domain of community participation	Selected indices	Acceptable values	Sample statistic		Meets criterion	
			Model A	Model B	Model A	Model B
Voluntary sector activity (AIC: start=179.86; end=55.45)	CMIN	$p > 0.05$	0.00	0.35	x	✓
	CMIN/DF	1 to 2	10.85	1.11	x	✓
	RMSEA	$< 0.05 - 0.08$	0.10	0.01	x	✓
	RMR	$< 0.05$	0.05	0.01	✓	✓
Political action (AIC: start=43.97; end=21.42)	GFI	$> 0.90$	1.00	1.00	✓	✓
	AGFI	$> 0.90$	0.99	1.00	✓	✓
	TLI	$> 0.90$	0.85	1.00	x	✓
	CFI	$> 0.95$	0.90	1.00	x	✓
	NFI	$> 0.90$	0.89	1.00	x	✓
	CMIN	$p > 0.05$	0.00	0.07	x	✓
	CMIN/DF	1 to 2	4.79	2.71	x	x
	RMSEA	$< 0.05 - 0.08$	0.06	0.04	✓	✓
	RMR	$< 0.05$	0.11	0.03	x	✓
	GFI	$> 0.90$	0.95	0.99	✓	✓
	AGFI	$> 0.90$	0.84	0.93	x	✓
	TLI	$> 0.90$	0.69	0.92	x	✓
	CFI	$> 0.95$	0.84	0.97	x	✓
	NFI	$> 0.90$	0.82	0.96	x	✓

Note: For an explanation of acronyms, see Table 9.

**Table E3: Items retained in 13 one-factor congeneric models of community participation, their domains, item weightings, squared multiple correlations, and standardised regression weights**

Domain of participation	Items retained in models	Item weighting	Squared multiple correlation	Standardised regression weight
Contact with immediate household	I see people in my immediate household at the start of my day	0.32	0.71	0.84
	Members of my immediate household are home when I am	0.12	0.53	0.73
	I spend my spare time with my immediate household	0.20	0.55	0.74
	I eat my main meal with people in my immediate household	0.26	0.72	0.85
Contact with extended family	I spend time doing things with people in my extended family	0.29	0.61	0.86
	I talk on the telephone to people in my extended family	0.08	0.81	0.59
	I see members of my extended family in person	0.42	0.35	0.90
	I prepare or eat meals with people in my extended family	0.18	0.74	0.78
Contact with friends	I make time to keep in touch with my friends	0.34	0.75	0.87
	My friends come over to my place or I go to theirs	0.26	0.66	0.81
	I talk to friends on the telephone or send them emails or letters	0.22	0.63	0.80
	I give my friends gifts such as birthday presents	0.06	0.33	0.57
Contact with neighbours	I chat with my neighbours 'over the fence' or 'in the stairwell'	0.16	0.72	0.85
	My neighbours tell me their news or I tell them mine	0.67	0.93	0.96
	My neighbours come over to my place or I go to theirs	0.06	0.58	0.76
	I talk with my neighbours about what's going on in our neighbourhood	0.11	0.68	0.83
Social contact with workmates	I go to work social events if I'm invited	0.14	0.38	0.61
	I do things at the weekend with people from work	0.21	0.47	0.68
	I spend my lunch or tea-breaks with my workmates	0.21	0.51	0.72
	I socialise with my workmates before work, after work or during breaks	0.34	0.65	0.80

Domain of participation	Items retained in models	Item weighting	Squared multiple correlation	Standardised regression weight
Ongoing informal learning	I participate in distance learning (for example, by correspondence, via the internet)	0.00	0.15	0.39
	I study, do assignments or sit exams for a certificate, diploma, degree or other qualification	0.06	0.23	0.53
	I go to courses or evening classes whenever I can	0.43	0.82	0.91
	I take opportunities in my community to try out or learn new things	0.06	0.26	0.51
Religious observance	I make time to attend services at a place of worship	0.56	0.77	0.88
	I go to religious services for special events like weddings	0.05	0.13	0.37
	I go to prayer meetings with others who share my beliefs	0.28	0.60	0.77
	I visit places of worship as a sightseer or tourist	0.04	0.12	0.35
Organised community activities	I take an active part in organised group activities (for example, choir, sport)	0.50	0.87	0.93
	I attend at least one group that organises activities in my community	0.24	0.75	0.87
	I go to rehearsals, training sessions, meetings or other organised group activities	0.15	0.63	0.79
	I pay membership fees to a group that organises activities in my community	0.11	0.54	0.74
Voluntary sector activity	I do voluntary or charity work for local not-for-profit groups	0.04	0.49	0.70
	I join organising committees for voluntary or not-for-profit groups	0.21	0.87	0.93
	I do casual unpaid voluntary work or I help out for free locally	0.04	0.58	0.76
	If I'm in a group doing voluntary work or helping out for free, I take responsibility for getting things done	0.01	0.42	0.65
	I regularly renew my membership with a voluntary or not-for-profit group	0.04	0.37	0.61
	If I do voluntary work or help out for free, I take on jobs like secretary, coordinator or treasurer	0.00	0.61	0.78
	When it comes to voluntary work or helping out for free I'm one of the leaders or organisers	0.07	0.65	0.80

Domain of participation	Items retained in models	Item weighting	Squared multiple correlation	Standardised regression weight
Giving money to charity	I sign petitions if I agree with the cause	0.06	0.11	0.32
	If I'm asked, I buy products sold by charities (for example, Blind Society Christmas cards)	0.23	0.48	0.70
	I give money to charity if I'm asked	0.42	0.66	0.82
Active interest in current affairs	I listen to the radio for news about national and international affairs	0.10	0.42	0.65
	I read articles in magazines about current affairs all over Australia and overseas	0.05	0.32	0.56
	I follow current affairs about my community on a local or commercial radio station	0.03	0.26	0.51
	I watch national and international news and current affairs on television	0.16	0.51	0.71
	I read articles in the paper about national and international affairs	0.17	0.56	0.75
Expressing opinions publicly	I talk about current affairs with my friends or family	0.18	0.57	0.75
	I watch current affairs or news programs about local events on TV	0.03	0.27	0.52
	I have opinions on issues in current affairs or the news	0.06	0.28	0.53
	I write a letter to the newspaper or contact a radio station if I want to say what I think about current affairs	0.14	0.47	0.68
	If necessary I talk to a local politician about issues in current affairs	0.19	0.57	0.86
Community activism	I write to local politicians to tell them what I think about things	0.38	0.75	0.75
	I contact other members of my current affairs group to remind them to come to meetings, pay their dues, etc	0.15	0.56	0.75
	I encourage others to join a group involved in current affairs	0.18	0.62	0.79
	I hand out leaflets for a group involved in current affairs	0.13	0.50	0.71
	I go to meetings of a group involved in current affairs in my community	0.10	0.44	0.67
	I arrange meetings, send out information or help with other administrative tasks for a group involved in current affairs	0.13	0.48	0.69
	I get involved in organising a current affairs group	0.14	0.51	0.71

Domain of participation	Items retained in models	Item weighting	Squared multiple correlation	Standardised regression weight
Political action	I join unions, political parties, or groups that are for or against something	0.42	0.66	0.81
	I go to meetings of a union, political party, or group that's for or against something	0.22	0.45	0.67
	I go on demonstrations or marches	0.16	0.35	0.59
	I do things like wear badges or display bumper stickers to do with issues in current affairs	0.10	0.20	0.44

# Appendix F: Descriptive data for participation perceptions indices

## Too much participation

Table F1 presents mean scores and standard deviations of scores calculated when perception variables for participating too much were split and recoded to 0, 1, 2.

**Table F1: Mean (and standard deviation) of too much participation in the original (prior to model fitting) 15 domains of participation<sup>(a)</sup>**

	All	Sex	
		Female	Male
Household	0.14 (0.42)	0.17 (0.46)	0.10 (0.35)*
Extended family	0.02 (0.18)	0.03 (0.02)	0.02 (0.17)
Friends	0.01 (0.11)	0.01 (0.08)	0.01 (0.13)
Neighbours	0.01 (0.14)	0.01 (0.08)	0.02 (0.18)*
Workmates	0.02 (0.17)	0.01 (0.14)	0.02 (0.19)
Religious services	0.04 (0.27)	0.02 (0.20)	0.06 (0.33)*
Education	0.03 (0.21)	0.03 (0.23)	0.03 (0.19)
Community activities	0.04 (0.21)	0.04 (0.20)	0.04 (0.22)
Voluntary work	0.06 (0.28)	0.06 (0.29)	0.06 (0.26)
Running voluntary groups	0.06 (0.27)	0.06 (0.28)	0.05 (0.26)
Local news	0.03 (0.19)	0.01 (0.08)	0.05 (0.25)**
Inter/national news	0.06 (0.26)	0.03 (0.19)	0.08 (0.31)**
Discussing news	0.04 (0.21)	0.02 (0.16)	0.05 (0.24)*
Current affairs groups	0.01 (0.13)	0.02 (0.15)	0.01 (0.10)
Running current affairs groups	0.02 (0.17)	0.02 (0.15)	0.03 (0.18)

(a) See Berry, Rodgers & Dear 2007.

Note: \* $p < 0.05$ ; \*\* $p < 0.001$ .  
Scores range from 0 to 2.

Participants scoring on or above the mean were given a score of 1 (too much participation) and those below the mean were given a score of 0 (not too much participation).

## Too little participation

Table F2 presents mean scores and standard deviations of scores calculated when perception variables for participating too little were split and recoded to 0, 1, 2.

**Table F2: Mean (and standard deviation) of too little participation in the 15 domains of participation**

	All	Sex	
		Female	Male
Household	0.22 (0.51)	0.19 (0.47)	0.26 (0.56)*
Extended family	0.75 (0.74)	0.78 (0.75)	0.72 (0.73)
Friends	0.53 (0.69)	0.57 (0.71)	0.49 (0.68)
Neighbours	0.32 (0.62)	0.34 (0.66)	0.29 (0.58)
Workmates	0.38 (0.70)	0.40 (0.72)	0.36 (0.69)
Religious services	0.61 (0.83)	0.65 (0.82)	0.57 (0.83)
Education	0.67 (0.77)	0.68 (0.77)	0.66 (0.77)
Community activities	0.52 (0.74)	0.53 (0.76)	0.51 (0.74)
Voluntary work	0.70 (0.80)	0.73 (0.80)	0.67 (0.79)
Running voluntary groups	0.72 (0.84)	0.72 (0.85)	0.73 (0.83)
Local news	0.21 (0.48)	0.25 (0.52)	0.17 (0.44)*
Inter/national news	0.14 (0.39)	0.18 (0.44)	0.10 (0.33)**
Discussing news	0.19 (0.46)	0.22 (0.49)	0.17 (0.43)
Current affairs groups	0.59 (0.82)	0.58 (0.82)	0.59 (0.83)
Running current affairs groups	0.60 (0.84)	0.62 (0.85)	0.58 (0.83)

Note: \* $p < 0.05$ ; \*\* $p < 0.001$ .  
Scores range from 0 to 2.



## Enjoying participation

Table F3 presents mean scores and standard deviations of scores calculated when perception variables for enjoying participating were split and recoded to 0, 1, 2.

**Table F3: Mean (and standard deviation) of enjoyable participation in the 15 domains of participation**

	All	Sex	
		Female	Male
Household	1.08 (0.80)	1.08 (0.78)	1.08 (0.82)
Extended family	1.12 (0.75)	1.19 (0.73)	1.04 (0.77)**
Friends	1.19 (0.70)	1.25 (0.68)	1.13 (0.71)*
Neighbours	0.45 (0.61)	0.46 (0.62)	0.43 (0.61)
Workmates	0.34 (0.59)	0.33 (0.59)	0.34 (0.60)
Religious services	0.27 (0.60)	0.32 (0.65)	0.21 (0.54)*
Education	0.30 (0.57)	0.31 (0.57)	0.29 (0.56)
Community activities	0.57 (0.73)	0.61 (0.74)	0.52 (0.71)*
Voluntary work	0.41 (0.66)	0.47 (0.69)	0.35 (0.61)**
Running voluntary groups	0.19 (0.47)	0.20 (0.47)	0.18 (0.48)
Local news	0.40 (0.58)	0.38 (0.56)	0.41 (0.60)
Inter/national news	0.46 (0.64)	0.42 (0.62)	0.51 (0.65)*
Discussing news	0.42 (0.60)	0.39 (0.58)	0.44 (0.62)
Current affairs groups	0.05 (0.24)	0.05 (0.24)	0.06 (0.24)
Running current affairs groups	0.04 (0.22)	0.03 (0.19)	0.06 (0.26)

Note: \* $p < 0.05$ ; \*\* $p < 0.001$ .  
Scores range from 0 to 2.

## Not enjoying participation

Table F4 presents mean scores and standard deviations of scores calculated when perception variables for enjoying participating were split and recoded to 0, 1, 2.

**Table F4: Mean (and standard deviation) of unenjoyable participation in the 15 domains of participation**

	All	Sex	
		Female	Male
Household	0.03 (0.20)	0.03 (0.22)	0.02 (0.18)
Extended family	0.03 (0.22)	0.03 (0.24)	0.03 (0.21)
Friends	0.01 (0.12)	0.01 (0.15)	0.00 (0.07)
Neighbours	0.02 (0.18)	0.02 (0.20)	0.02 (0.15)
Workmates	0.01 (0.12)	0.02 (0.16)	0.00 (0.07)
Religious services	0.07 (0.33)	0.06 (0.31)	0.09 (0.36)
Education	0.03 (0.23)	0.04 (0.23)	0.03 (0.23)
Community activities	0.03 (0.22)	0.04 (0.23)	0.03 (0.21)
Voluntary work	0.03 (0.21)	0.02 (0.15)	0.05 (0.26)*
Running voluntary groups	0.04 (0.24)	0.04 (0.25)	0.04 (0.22)
Local news	0.02 (0.17)	0.02 (0.17)	0.02 (0.16)**
Inter/national news	0.02 (0.19)	0.04 (0.24)	0.01 (0.10)
Discussing news	0.02 (0.18)	0.02 (0.18)	0.02 (0.17)
Current affairs groups	0.05 (0.29)	0.06 (0.31)	0.05 (0.27)
Running current affairs groups	0.04 (0.27)	0.06 (0.32)	0.03 (0.20)*

Note: \* $p < 0.05$ ; \*\* $p < 0.001$ .  
Scores range from 0 to 2.

## List of shortened forms

ACPQ	Australian Community Participation Questionnaire
AGFI	Adjusted goodness-of-fit indicator
AIC	Akaike information criterion
CAIC	Consistent Akaike information criterion
CFI	Comparative fit index
CMIN	Chi-squared
CMIN/DF	Normed Chi-squared
GFI	Goodness-of-fit indicator
HILDA	Household, Income and Labour Dynamics in Australia
NFI	Normed fit index
OTI	Organizational Trust Inventory
RMR	Root mean square residual
RMSEA	Root mean square error of approximation
TLI	Rho2/Tucker Lewis Index
WVS	World Values Survey



# Endnotes

- 1 'Australia at a turning point', speech for National Archives of Australia series 'Where to now, Australia?', 2001.
- 2 <[http://www.communitybuilders.nsw.gov.au/building\\_stronger/safer/comm\\_bldg.html](http://www.communitybuilders.nsw.gov.au/building_stronger/safer/comm_bldg.html)>.
- 3 In this study, mental health problems are defined as including specific mental disorders that meet clinical diagnostic criteria and also mental health problems at sub-clinical levels.
- 4 For a recent empirical review of the decline in social capital in America, see Costa and Kahn 2003.
- 5 For detailed information about, and examples of, the use of multi-level modelling in health research, see the seminal work of Blakely and Subramanian (2006).
- 6 For a review of the relationship between income inequality and social capital, see Macinko and Starfield (2001).
- 7 The Household, Income and Labour Dynamics of Australia (HILDA) survey (2006, 2002) is a large, nationally representative panel survey of Australian adults aged 15 years and over, in which participants report on a large range of health and social factors. Data are collected annually and, in each wave, respondents complete four separate survey questionnaires.
- 8 This finding is consistent with previous research in another Australian sample, in which higher levels of harmony (universalistic) values were associated with higher levels of distress (Berry & Rickwood 2000).
- 9 More extroverted and sociable people have fewer mental health problems than do more introverted, less sociable people (for a review, see Berry et al. 2007).



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