

Social capital

Empirical meaning and measurement validity

Wendy Stone and Jody Hughes

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Contents

List of tables	vi
List of figures	vi
List of appendices	vi
Acknowledgements	vii
About the authors	vii
Abstract	viii
Introduction	1
Measurement issues at stake	2
A theoretically informed measurement framework	3
Network types and the norms that govern them	3
The structure of social relations: network characteristics	4
Norms, networks and network characteristics	5
Social capital, its determinants and outcomes	5
Data and methodology	6
Analytic strategy	7
Three analytic approaches to measuring social capital	11
Analytic technique 1: A network-based approach to measuring social capital	11
Informal realm	12
Generalised realm	14
Institutional realm	16
Summary	17
Analytic technique 2: An overall measure of social capital?	18
Analytic technique 3: A typology-based approach to measuring social capital	23
Validity and meaningfulness of measures	27
Validity of scales of social capital dimensions in separate network types	28
Informal realm	28
Generalised realm	32
Institutional realm	33
Validity of overall social capital scales	34
Validity of the social capital typology	35
Comparing the three approaches	37
Summary and conclusions	38
References	41

List of tables

Table	1.	Reliability testing of scales of social capital in the informal realm	13
	2.	Measures of social capital in the informal realm	14
	3.	Reliability testing of scales of social capital in the generalised realm	15
	4.	Measures of generalised social capital	16
	5.	Reliability testing of scales of social capital in the institutional realm	17
	6.	Correlation table for measures of social capital in the informal, generalised and institutional realms	19
	7.	Results of principal components analysis showing core dimensions of social capital	21
	8.	Reliability testing of overall measures of social capital	22
	9.	Profile of social capital clusters	25
	10a.	Norms, connections and density in the informal realm: the influence of expected predictors	29
	10b.	Diversity in the informal realm: the influence of expected predictors	31
	11.	Social capital in the generalised realm: the influence of expected predictors	33
	12.	Institutional social capital: the influence of expected predictors	34
	13.	Overall measures of social capital: the influence of expected predictors	35
	14.	Marginal effects on multinomial logit estimates of cluster group membership	36

List of figures

Figure	1.	Summary of core measures of social capital, and illustrative examples of its determinants and outcomes	2
Figure	2.	Survey items measuring the quality and structure of social relations, at informal, generalised and institutional scales	8

List of appendices

<i>Appendix A.</i>	<i>Imputing missing values for institutional confidence items</i>	42
<i>Appendix B.</i>	<i>Correlation tables</i>	43
	B1 Correlations among informal social capital items	43
	B2 Correlations among generalised social capital items	44
	B3 Correlations among institutional social capital items	45
<i>Appendix C.</i>	<i>Factor analysis</i>	48
	C1 Factor analysis using constructed scales of informal, generalised and institutional social capital	48
	C2 Factor analysis using original informal, generalised and institutional social capital items	50
<i>Appendix D.</i>	<i>Validity testing</i>	56
	D1 Coding scheme and summary statistics	56
	D2 Results of regression analyses for scales of social capital in separate network types	57
	D3 Results of regression analyses for overall social capital scales: across network dimensions	63
	D4 Results of regression analysis for social capital typology	64

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Abstract

Despite being described as an empirically elusive concept, “social capital” has attracted much policy and academic interest. However, little is known about social capital in practice, since measurement of the concept remains an emerging field. This paper aims to contribute to the development of theoretically based and empirically valid measures of social capital that can be applied in future work. The paper draws on data collected in a national random survey of 1,500 Australian households, to develop and test three competing approaches to measuring social capital, useful for application in different types of settings and for different research questions. The first develops network-based measures, the second explores the question of whether we can construct a single measure of social capital, and the third develops a cluster-based typology of social capital, useful for understanding the types of circumstances that are associated with people being “social capital rich” or “social capital poor”.

Social capital: Empirical meaning and measurement validity

Introduction

“Social capital” has been described as an empirically elusive concept, yet has also been heralded as the glue that holds communities together. While there has been much debate about its definition (see Winter 2000), social capital can be understood as networks of social relations which are characterised by norms of trust and reciprocity and which lead to outcomes of mutual benefit.

The essence of social capital is quality social relations. It is the quality of relationships, understood through the use of the concept “social capital”, which affects the capacity of people to come together to collectively resolve problems they face in common (Stewart-Weeks and Richardson 1998: 2), and achieve outcomes of mutual benefit (Lochner et al. 1999). Thus, social capital can be understood as a resource to collective action, which may lead to a broad range of outcomes, of varying social scale. For individuals, this can mean access to the reciprocal, trusting social connections that help the processes of getting by or getting ahead. For communities, social capital reflects the ability of community members to participate, cooperate, organise and interact (Cavaye 2001).

Currently, there is much policy and academic interest in the capacity of social capital to generate both micro level outcomes such as family wellbeing as well as macro level outcomes such as efficient economies, democratic polities and active communities (see, for example, the work of Bourdieu 1993; Coleman 1988, 1990; Putnam 1993, 1995; and Winter 2000 for a discussion of social capital in Australian public policy).

Social capital is often equated with notions of strong or prosperous communities. It is therefore not surprising that research suggesting that social capital, and community, are in decline (particularly the United States research by Putnam 1995, 1998) have reignited an interest in “community”, and in understanding more about the concept of social capital, in particular.

As well, the social capital concept has attracted criticism – both for its underlying assumptions and theoretical basis as well as for the rapidity of its uptake and usage (see, for example, Fine 2001). Much of this criticism is made on the basis of political position, limited theoretical critique and/or limited empirical scrutiny.

Indeed, much of both the popularity *and* criticism of the concept are based on relatively untested assumptions about the way social capital is manifested, generated and distributed empirically – and, ultimately, how it might lead to a host of other outcomes. Although several empirical studies have now been undertaken in Australia and elsewhere (see, for example, Onyx and Bullen 2000; Paxton 1999; Narayan and Cassidy 2001), relatively little is still known about social capital in practice – particularly as it features in the lives of different types of families in a range of communities. As a result, the true value of the concept

and how it might be facilitated in policy or service provision remain largely unknown. To a large degree, these gaps in our understanding result from the gulf that continues to exist between social capital theory and empirical work.

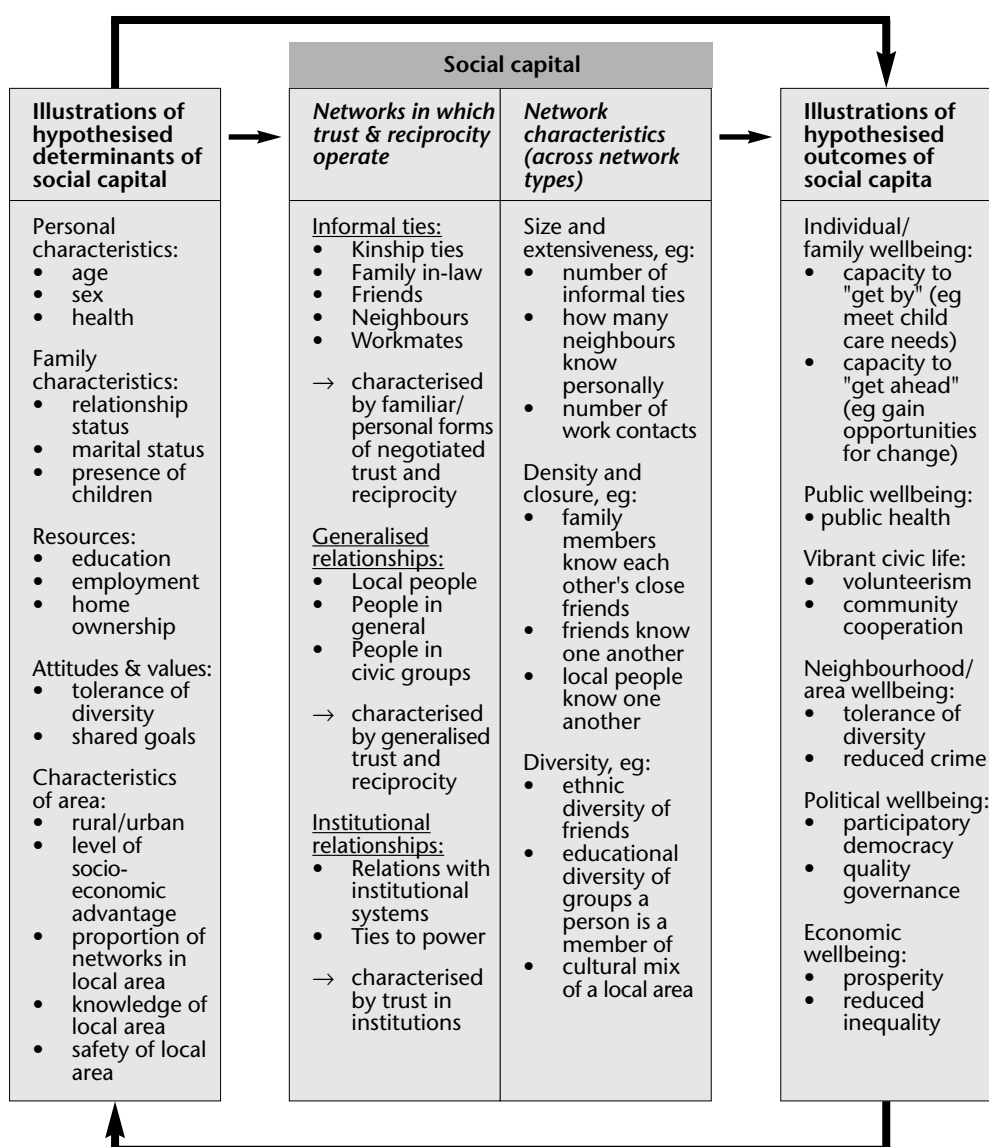
Measurement issues at stake

The gulf between theoretical understandings of social capital and the ways social capital has been measured in much empirical work to date has led to a host of problems (Paxton 1999; Portes 1998; Stone 2001; Stone and Hughes 2001). Principles for avoiding these problems can be summarised in four points (see Stone & Huges 2001 for discussion).

First, social capital measurement and “practice” needs to be theoretically informed. Otherwise, anything and everything is labelled as social capital, and old ideas and concepts are simply repackaged in a new guise.

Second, social capital should be understood as a resource to collective action. If we wish to determine whether social capital produces a range of other desirable

Figure 1. Summary of core measures of social capital, and illustrative examples of its determinants and outcomes



Source: Families, Social Capital & Citizenship project, Australian Institute of Family Studies, 2002.

social and economic outcomes, such as active communities, we must avoid the tautological trap of conflating social capital with social action or other outcomes.

Third, empirical work must recognise that social capital is a multidimensional concept. We must understand how the various dimensions of social capital inter-relate and relate to the concept as a whole before we can understand how they relate to other outcomes of interest.

And finally, we must recognise that social capital will vary by network type and social scale. A dimension of social capital in one network may not correspond with a different dimension of social capital in another network, or with outcomes which may or may not be measured on a different scale again.

For the concept of social capital to be a useful theoretical, empirical and policy tool, these four key principles should be borne in mind. It should also be recognised that measurement of the concept of social capital is still in the early stages of development. Some common themes are developing and some consensus about measurement is being achieved in more recent social capital research. However, social capital measurement remains an emerging field, in which it is important to test and validate numerous approaches to measurement, the refinement of which will happen over time, through retesting, re-use and ongoing development of both conceptual and empirical understandings of social capital.

The aim of this paper is to contribute to this process, by developing and testing theoretically based measures of social capital that can be applied and further refined in future work.

A theoretically informed measurement framework

A conceptual framework for measuring social capital was developed within the *Families, Social Capital and Citizenship* project (for detailed discussion of this framework see Stone 2000). The framework begins from the definition of social capital set out above, and conceptualises social capital as a multidimensional concept comprising networks, trust and reciprocity. The framework emphasises both the *quality* and *structure* of social relations. Key measures of social capital include norms and various network characteristics, in different network types. The framework is summarised at Figure 1, and is discussed below.

Network types and the “norms” that govern them

The first of the two middle columns of the diagram describes the network types in which social capital operates. By definition, social capital is not restricted to particular social networks of one type or another. The literature identifies social capital in local and other community networks (Putnam 1993; Kreuter 1999), at the level of nation states (Knack and Keefer 1997) and, albeit less commonly, within families and other networks of familiars (Coleman 1988; Amato 1998; Furstenberg and Hughes 1995).

In response, the conceptual framework used here distinguishes between social capital within different sorts of networks, which exist at different social scales. These range from household and family level ties, to community based and “societal” relations people have with people they do not know personally, to the ties individuals and families have with institutions. These three sets of social relations are described here as belonging to the “informal realm”, “generalised realm” and “institutional realm”, respectively.

The framework also highlights the fact that the norms governing these different types of network relationships will vary. While “norms” is a broad term, for the

purposes of this paper we are referring to social capital norms in particular – specifically, *norms of trust and reciprocity*. We expect these will take three forms. The first are the norms that exist among familiars. These exist within established relationships and social networks, referred to here as “informal networks”. The second type of norm is more generalised, and concerns the extent to which trust and reciprocity are extended to strangers, often on the basis of expectations of behaviour or a sense of shared values. We describe these as “generalised relations”. These generalised relations can also include relationships people have with civic life through such things as memberships of formal groups. Third are the norms governing people’s confidence (trust) in institutions. These basically concern trust in the formal institutions of governance and markets and include, for example, fairness of rules, official procedures, dispute resolution and resource allocation. We refer to these as “institutional relations”

The structure of social relations: network characteristics

Also in the centre of the diagram is a column which summarises measures of the structure of the social relations in which norms operate, or what we term “network characteristics”. The importance of measuring network characteristics stems from the idea that the nature of social capital varies according to certain characteristics of the structure of the networks in which trust and reciprocity inhere. These characteristics include the scope or extent of social networks (see, for example, Paxton 1999), the density of social ties (Coleman 1988; Krishna and Uphoff 1999), and the diversity of social relations (Krishna and Uphoff 1999).

On the basis of previous literature, we expect that different combinations of network characteristics will affect the overall capability of social capital. For example, various combinations of these network characteristics reflect in some ways the recent distinctions made in social capital theory and research between “bonding”, “bridging” and “linking” social capital (for discussion see Putnam 1998; Narayan 1999; Woolcock 2000). Bonding social capital refers to trust and reciprocity in dense or closed networks, and helps the process of “getting by” in life on a daily basis. In contrast, “getting ahead” tends to be facilitated through bridging social capital involving overlapping networks which may make accessible the resources and opportunities which exist in one network to a member of another. Heterogeneity or diversity of network members (in informal or formal groups) is argued to enhance the bridging capabilities of social capital. Finally, linking social capital involves social relations with those in authority, which might be used to garner resources or power.

Thus different “capabilities” of social capital relate to the range of network characteristics described at Figure 1.¹ The first of these is the size and capacity of a given network. Networks can be anything from limited to extensive in size and capacity, and may involve relations within the household, at the neighbourhood or local community scale, to global and virtual relations which operate at vast distance. The size and capacity of social networks may affect overall stocks of social capital. Individuals and families with large numbers of social ties *may* have access to a large stock of social capital, depending on the nature of those ties. Those with few social ties may thus have little access or opportunity to invest in social capital.

1 While there is not necessarily a neat match between the bonding, bridging and linking distinction and network characteristics, as the classifications developed for different purposes and at different times, we can nonetheless use various combinations of network characteristics to inform our measurement of the bonding, bridging and linking social capital.

The degree to which networks are dense or closed is also argued to have implications for the quality of the relationships they embody, and their productive output (Coleman 1988). A dense network is one in which network members overlap and know one another and a closed network is one in which social relations exist between all parties. As Coleman (1988: 107-108) explains: "Closure of social structure is important not only for the existence of effective norms but also for another form of social capital: the trustworthiness of social structures that allows the proliferation of obligations and expectations . . . closure creates trustworthiness in a social structure."

Heterogeneity of group or network membership is also said to influence the levels of trust within networks, the extent to which trust of familiars translates into generalised trust of strangers, and the extent to which norms within networks are shared. Heterogeneity of social ties may promote linkages with a diverse range of networks and hence access to a broad range of resources or opportunities *or* inhibit the development of trusting, reciprocal relations because of differences.

Norms, networks and network characteristics

As the discussion above shows, key measures of social capital are norms and networks. Each of these measures or "dimensions" are an important part of the social capital picture. In addition, the norms that operate in different network types are argued to be integrally related to particular characteristics of those networks. As discussed, the relationships between norms, networks and network characteristics is not straight forward or linear. For example, while one type of network characteristic may be thought to increase levels of trust and reciprocity, another may hinder these norms. Importantly, different combinations of network characteristics are argued to affect the capability of social capital and therefore the outcomes that are related to it.

Measures of norms, networks and network characteristics are presented throughout this paper as important aspects of the social capital picture and hence key parts of the measurement framework for understanding social capital as a whole. We may think of network characteristics as core *dimensions* of social capital, along with norms and networks, or as key parts of the social capital picture that *mediate* the relationship between the determinants and outcomes of trust and reciprocity in a range of network types.

In the following analyses, we examine how norms, networks and network characteristics interact. This helps inform upon the question of whether we ought to conceptualise network characteristics as core dimensions of social capital, along with norms and networks, but also the more immediate empirical question of whether a measurement framework must include all these elements of the social capital picture or whether measures of only some of the core elements (such as norms and networks) will suffice. These are questions we return to at the end of the paper.

Social capital, its determinants and outcomes

As stated above, in order to investigate social capital empirically it is critical to separate measures of social capital from measures of its determinants and outcomes.² As well as core measures of social capital, Figure 1 presents examples

2 Where a strong and demonstrated relationship exists between measures of social capital and various determinants or outcomes, measures of these determinants or outcomes might be able to be used as indicators of social capital. Note that while such measures are often used as indicators in the way described, to date there has been little empirical investigation of the actual relationship between social capital and those factors argued to facilitate or flow from it.

of hypothesised determinants and outcomes of social capital (in the far left and far right columns of the diagram). These include other “capitals” such as human capital (education and employment related experience) and financial capital (financial wellbeing, or economic growth), as well as other factors such as health and cultural diversity, which have been linked to social capital in previous research. Many of these determinants and outcomes reflect key concerns of researchers and policy makers.³

At a practical level in policy and measurement terms, we are sometimes concerned with social capital as a dependent variable (which policies might wish to enhance), and sometimes concerned with social capital not for its own sake but because we expect it to facilitate other outcomes. For example, while there is current policy interest in identifying and supporting the factors that facilitate social capital, this is often because enhancing social capital is anticipated to facilitate other outcomes, such as economic growth in a region, or public health.

The fact that some of the determinants listed at Figure 1 also feature as outcomes is no accident. Social capital, like other “capitals”, is argued to be both facilitated by certain factors, and in turn produce various outcomes. These outcomes may serve to further facilitate social capital. In the example of local area safety, a sense of safety in an area might facilitate residents becoming acquainted, which in turn might enable them to act together, and further facilitate reduced crime (either directly, through working on a joint project about crime reduction, or indirectly, by informally looking out for one another’s property, and the like).

This is an example of a cumulative causal cycle, something which is pervasive in the social sciences but is seldom discussed because of the analytical complexities it poses. Narayan and Cassidy (2001), whose model of social capital is similar to ours in this respect, describe the resulting conceptual and empirical complexity as “psychometrically vexing” (Narayan and Cassidy 2001: 66). While this is true, good social capital measurement must recognise that social capital is separate from its outcomes, and that sometimes the key determinants of social capital may also be the outcomes we are most interested in.

Data and methodology

The paper draws on survey data collected in 2000–2001 as part of the *Families, Social Capital and Citizenship* project being undertaken by the Australian Institute of Family Studies. A total of 1506 respondents participated in the survey. These were drawn from a national random sample of households (with at least one person aged 18 years or older).⁴

The data contain a number of biases. First, as the data were collected via the telephone, those who are highly mobile, or who do not have a telephone or have a silent number, as well as those who “vet” calls via answering machine, are under-represented in this study. As well, the survey was only conducted in English due to limited resources. Where householders were unable to undertake the survey in English, these households were excluded from the study.

3 Understanding the links between many of these determinants, social capital, and other outcomes is also the core concern of the Families, Social Capital & Citizenship project. In particular, the project focuses upon the relationship between social capital and family, community, economic and political outcomes.

4 Interviews were conducted via the telephone using the Institute’s Computer Assisted Telephone Interviewing system (CATI), and were 32 minutes duration on average. For more information on survey methodology and fieldwork outcomes see the Families Social Capital and Citizenship Fieldwork Report (Hughes and Stone 2002) available on the Australian Institute of Family Studies website at <http://www.aifs.org.au>.

Another bias relates to those who chose to participate in the survey. The survey over-represents women (69.2 per cent compared with 31.8 per cent men) and those who are tertiary educated (both because they are more likely to be contacted via the telephone and/or more likely to agree to be interviewed). The survey data have been weighted by sex and education for the purposes of analysis, such that men and women as well as people with all levels of educational qualifications are represented in the data in proportions consistent with national statistics.

Finally, a further source of bias of specific relevance for analysis of social capital should be mentioned. It is possible that those people who responded to the telephone survey are those most likely either to be trusting of organisations and institutions, or to engage in civic or community life. The evidence is mixed. Some social capital research indicates there is a difference in the population of people who take part in social surveys and those who do not (see for example Bullen 2002). Conversely, other research indicates no difference in the social capital of people who do and don't respond to surveys (Keeter et al 2000). As a result, it is difficult to know whether the survey overstates the levels of trust and participation in Australian life, if results are generalised to the whole community. Differences in levels of trust and connectedness between those who agreed to participate in this survey and those who did not remains unknown.

The survey is based on (and designed to test) the conceptual and empirical framework presented above and collected information about respondents' social networks and the quality of relationships in those networks, a range of outcome measures, detailed demographic information, and factors argued to be key determinants of social capital. The survey includes both replications of items used in previous research (to allow for national and international comparisons and data validation) as well as original items, particularly around the social capital measures. Thus, the survey focuses on individuals and their reports of their family life, networks and communities.

Analytic strategy

Using survey items which reflect the conceptual framework presented above, the paper first constructs and tests the reliability of measures of the core elements of social capital within informal, generalised and institutional realms. The key question is whether we can construct with statistical reliability empirical measures of the norms, networks and network characteristics set out in the conceptual framework presented above. Next the paper takes two approaches to examining how these dimensions operate together, and indeed whether the respective dimensions of social capital can be summarised adequately in one scale or measure. The first of these is variable based, the second groups respondents on the basis of social capital characteristics and is therefore respondent based.

Hence, the paper develops three key analytical approaches to measuring social capital, before testing the statistical validity of each of these. There are two main reasons for developing and testing several measurement approaches in this paper, rather than only one.

The first is the fact that the development of measurement tools for understanding social capital is a process which is in its early stages. Only via the rigorous development and testing of theoretically informed measures and approaches of analysis will social capital measurement advance over time.

The second reason relates specifically to social capital theory and the tension between the multi-dimensional nature of social capital and the policy and practice need for simple, cost-effective, efficient measures or indicators of social

Figure 2. Survey items measuring the quality and structure of social relations, at informal, generalised and institutional scales

Network type or social scale	Dimensions of social capital				Diversity
	Trust	Reciprocity	Size	Density	
Informal networks					
Family/kin	To what extent do you trust your relatives to act in your best interests?	To what extent are your relatives willing to help each other out?	Number of relatives (count)	Extent to which family members know each other's close friends (11 point scale where 0 equals "not at all" and 10 equals "completely")	Do you or your family speak any language other than English at home? ("yes" or "no")
	To what extent do you trust your in-laws to act in your best interests?	To what extent are your in-laws willing to help each other out?	Number of in-laws (count)	-	Main language spoken at home (open ended)
Friends	To what extent do you trust your friends to act in your best interests?	To what extent are your friends willing to help each other out?	Number of friends (count)	Are your friends also friends with each other? ("yes", mostly, "some", "a few" or "no")	Does partner/3 closest friends or their family speak a language other than English at home? ("yes" or "no" for each person)
Workmates	To what extent do you trust your work mates or associates to act in your best interests?	To what extent are your workmates or associates willing to help each other out?	Number of previous work mates/associates keep in contact with (count)	-	Education level of partner and 3 closest friends (" $<$ yr12", "yr 12", "trade/ apprent.", " or "tertiary" for each person)
Neighbours	To what extent do you trust your neighbours to act in your best interests?	-	Number of neighbours known personally (count)	-	-

Continued opposite

Continued

Generalised relations					
Local people	Most people in my neighbourhood can be trusted.	People around here are really willing to help each other out	-	-	People around here share the same values (11 point scale where 0 equals "not at all" and 10 equals "completely")
People in general	Generally speaking, most people can be trusted.	Most of the time people try to be helpful.	-	-	-
Civic groups	-	-	Number of memberships in the following types of groups (count for each): Children or parenting groups Sporting, recreation or hobby groups Trade unions, professional or technical associations Political parties Environmental, human rights, community or welfare groups Arts, culture or educational groups Self help/support groups Other groups	-	Number of types of different group memberships (count) Do group members have mostly the same ethnic or cultural background or mostly mixed backgrounds? ("mostly mixed", "somewhat mixed" or "mostly same") Do group members have high, average or low levels of education, or are their educational backgrounds mostly mixed? ("high", "medium", "low" or "mixed")
Institutional relations¹					
	Level of confidence in: The legal system The churches The police force The media Trade unions Federal government State government Local government The Public service Major companies	-	Whether have personal ties to ("yes" or "no" for each): The legal system The churches The police The media Unions Government Political parties Universities Big business	-	-

Notes: 1. Reciprocity items were not included in relation to institutional relationships.

Source: Families, Social Capital & Citizenship survey, Australian Institute of Family Studies, 2001.

capital. On the one hand, social capital theory suggests we can expect different types of relationships and norms to operate among different network types. This implies the need for a relatively wide range of social capital measures. On the other hand, some types of policy or research question call for a single measure or at least a more simple framework for measuring social capital at micro and/or macro levels. Hence, the measurement approaches explored throughout this paper reflect different approaches to meeting each of these demands: the need for theoretical rigour in measurement, and the need for measurement efficiency.

Each of the three approaches is based upon a core set of survey questions, which measure norms of trust and reciprocity plus network characteristics within informal, generalised and institutional arenas, respectively. The survey items used in the paper are set out in Figure 2.

The measures of trust, reciprocity and density in different network types and social scales take the form of likert type scales, measured on a scale of zero to ten; and the measures of network size are all simple counts. These measures are used directly in the following analyses.

Measures of diversity were less straightforward to derive. The measures of diversity at the level of the community also take the form of likert type scales or simple counts and can be used directly in the following analyses. However, measures of the diversity of respondents' informal networks had to be constructed from a series of questions about individual network members, as described below.

In respect to the educational diversity of informal networks, respondents were asked to report their own level of education as well as the level of education of their partner (if in a relationship) and three of their closest friends. A scale of the educational diversity of informal networks was then constructed which represents the difference between the maximum and minimum level of education of these network members. As level of education was measured on a four-point scale (less than Year 12, Year 12, trade certificate or apprenticeship, or tertiary), the educational diversity measure takes one of four values: all the same level of education, one level difference, two levels of difference, or three levels of difference – in which case the network includes at least one person with the highest possible level of education (tertiary) and at least one person with the lowest possible level of education (less than Year 12).

In respect to the linguistic diversity of informal networks, respondents were asked whether they, their partner and their three close friends spoke a language other than English at home or with their family. A measure of the linguistic diversity of informal networks was constructed which represents the proportion of persons in respondents' informal network whose linguistic status is different from their own (the measure therefore ranges from zero to 100). Given the survey was conducted in English we may expect to find few respondents with highly diverse networks. However, a comparison of the characteristics of study participants with those of the Australian population indicated that the *Families, Social Capital and Citizenship* survey includes a large number of people from non-English-speaking backgrounds (see the *Families, Social Capital and Citizenship Fieldwork Report* (Hughes and Stone 2002)).

As can be seen from Figure 2, the survey items are measured from the perspective of the individual. That is, we ask respondents about their networks of informal ties, neighbourhood interactions, connections with institutions, and so on. Key advantages of the approach are that we are able to gather detailed maps of individual networks, as well as judgements about the quality of each of these network based relationships.

The individual-oriented approach does have some limitations, however. The main one is that the information gathered via this method is restricted to

respondents' own perceptions and experience – it does not include “objectively” measured data or information from other perspectives, which might provide a means for filling in some of the “gaps” in the table above. In particular, existing community data may also be useful for informing upon social capital questions in future research, as a compliment to these measures. For example, while this survey includes information about the extent of interaction between different ethnic groups in a community based on respondents' own behaviour and perceptions, it would be useful to make use of existing population based data to inform upon the existence of different ethnic groups per se – that is, the level of ethnic diversity within a local area. At a minimum, such information could be used to help interpret relationships found between core social capital measures (such as those from the survey data, above, on trust and reciprocity), and various other outcomes (such as public health within an area). This approach is often taken in community-centred methodologies – another method sometimes used for social capital research (see, for example, Kreuter et al. 1999; Onyx and Bullen 2000).⁵

Three analytic approaches to measuring social capital

Using the survey items described above, this section of the paper describes the rationale, development and results of each of the three respective approaches to measuring social capital in turn, before results about the statistical validity of each analytic technique are presented, near the end of this paper.

Analytic technique 1:

A network-based approach to measuring social capital

The first analytic approach examines the reliability of measures of the core elements of social capital (norms and network characteristics) *within particular types of networks* (or social realms), rather than combining all items, or any single dimension *across different types of networks*.

The rationales for this approach are twofold. First, we assume that there are differences between norms and network characteristics in different types of relationships and in different social realms. The second rationale stems from the acknowledgement that for some types of research question it is most appropriate to analyse social capital according to particular social realms, such as familiars, people in general, or at the level of institutions.

Based on the framework presented in Figure 1, we expect that the nature and levels of trust and reciprocity will differ in particular types of networks. Specifically, we have hypothesised that social capital will exist in informal networks, such as in family household groupings, kinship and in-law networks, and among friends. We further hypothesise that these ties will differ from linkages with strangers in the form of generalised trust and reciprocity, as well as from respondents' relationship with institutions.

Given this, we first examine measures of norms and network characteristics within *informal* types of networks, followed in turn by *generalised* and *institutional* relations.

5 In a community-centred approach, information is gathered from a variety of sources within one community (most often defined geographically). This mix of information typically includes survey data (enabling the individual-oriented perspective) as well as perceptions of key community informants and other available data. However, while this methodology is rich, the disadvantage of the approach is that results may be limited to specific communities. Patterns across many population groups and differences between populations residing in varied community settings are difficult to determine.

The aims of the analysis presented here are to construct measures of social capital within the respective network types, and determine how well these hold up empirically. To do this, for each of the network types, we first examine relationships between all individual items (norms and network measures) to gain an overview of the relationship between items. Next, we construct scales (where possible) of the respective measures of norms and network characteristics within each network type. The reliability of these scales is discussed here. As a further test of the measures, we examine the validity of each measure in relation to other factors we expect them to be related to (predictor variables) (this final test is presented near the end of this paper).

Informal realm

Within informal relationships, we distinguish between family based ties⁶, friendships, personal contact with neighbours, and relationships with colleagues or work contacts. The survey items provide information about the norms of trust and reciprocity governing these relationships, as well as the size of networks, the density and diversity of network memberships (all items are set out in Figure 2).

To gain an overview of the relationship between all items in the informal realm, we used Pearson's correlation coefficients to determine how strongly any one item was related to all other items. Specifically, we found that trust and reciprocity items were positively correlated (that, for example, the higher the levels of trust, the higher the levels of reported reciprocity in informal networks), and that some network characteristics were positively and significantly correlated (for example, having a large family was related to having a larger network of friends), but that there was little relationship between measures of the quality (norms) and structure of relationships (network characteristics) in the informal realm. In fact, most striking are the lack of relationships between most variables (see Appendix B.1 for results).

Next, we tested how well our measures of each dimension of social capital within informal relationships could be scaled together to form composite measures. Specifically, we examined alpha scores to test for scale reliability, and item-total correlations to examine scale unidimensionality. A reliable scale is one for which we can be confident that a person would have the same scale score on more than one occasion (de Vaus 1995: 255). In general, an Alpha score⁷ of .7 or more for any scale (on a range between 0 and 1) indicates a scale is reliable. As a rule, items included in a unidimensional scale should exhibit item-total correlation scores greater than .3 (on a range between 0 and 1) (de Vaus 1995: 255-256). The alpha scores and item-total correlation statistics for each scale are presented in Table 1.

6 'Family based ties' refer to networks of extended kin and family in-law beyond the respondents' household. The *Families, Social Capital & Citizenship* survey also asked about norms of trust and reciprocity among family in the household. These items are not included in the overall measures constructed here for several reasons. First, they were not asked of the entire population of survey respondents as not everyone lived in family based households. In addition, preliminary analysis indicated that where respondents had family members they lived with, the reported levels of trust and reciprocity for these networks was high (grand mean greater than 9 on a 0 to 10 scale), and that the measure therefore did not distinguish the sample in meaningful ways. Future analysis will explore the relationship between measures other aspects of family life and the measures of social capital developed here.

7 An alpha score is an index of the extent to which a person's response to one item in a scale is consistent with that person's responses to other items in the same scale (de Vaus 1995: 256).

First, in line with the positive correlation we saw earlier between the individual trust and reciprocity items, we found the items measuring norms governing informal ties could be combined into one scale with a high level of overall reliability ($\alpha = .72$, standardised $\alpha = .72$) and unidimensionality (see Table 1).

Pre-scale testing also indicated that combining measures of the *size* of various networks in the informal realm produced a relatively unidimensional scale (3 out of 4 items have item-total correlation statistics greater than .3), yet that this scale has less statistical reliability than the norm-based scale ($\alpha = .45$, standardised $\alpha = .52$). As a further test of the quality of this scale, the measure is subjected to validity testing near the end of this paper. The relatively low alpha scores are explained in part by the different realms the neighbours item and the other variables in the scale tap into. While the number of family, friends and work contacts respondents report are all individual based measures, the number of neighbours one knows is both a measure of a respondent's personal network, as well as an indicator of the area in which a respondent lives. Nonetheless, all are measures of the extent of informal ties.

The survey included two items measuring density of relationships in the informal realm. The first asked about the extent to which friends know one another (asked of all respondents), the second asked about the extent to which family members knew one another's close friends (only asked if respondents lived with other family members). While only the first of these items is included in analysis throughout this paper as it is a universal measure (not restricted to those living with family members), it is nonetheless interesting to see how well these items scale together, as a combined scale may be useful in future work or other studies.

The two density items exhibit a modest, positive correlation ($r = .2026$, $P = .000$), although do not combine together well to form a reliable scale. As shown at Table 1, both the alpha scores ($\alpha = .33$, standardised $\alpha = .34$) as well as item-total correlation statistics (.20 for each item) are low once these items are combined. The low alpha and item-total statistics suggest it makes sense to treat these items separately rather than combining them, where both are used in analysis.

<i>Scale and scale items</i>	Alpha (Standardised)	Item-total correlation
Informal social capital norms (4 items; n=1,430)	.72 (.72)	-
<i>Trust in kin</i>		.55
<i>Reciprocity among kin</i>		.49
<i>Trust in friends</i>		.53
<i>Reciprocity among friends</i>		.47
Informal social capital networks (4 items; n=1,486)	.45 (.52)	-
<i>Number of family</i>		.33
<i>Number of friends</i>		.39
<i>Number of work contacts</i>		.31
<i>Number of neighbours know personally</i>		.25
Informal social capital density (2 items; n=699)	.33 (.34)	-
<i>Friends are also friends with each other</i>		.20
<i>Family members know one another's close friends</i>		.20
Informal social capital diversity (2 items; n=1,461)	-.06 (-.07)	-
<i>Educational diversity of informal networks</i>		-.03
<i>Linguistic diversity of informal networks</i>		-.03

Source: Families, Social Capital & Citizenship survey, Australian Institute of Family Studies, 2001.

We examined two measures of diversity in the informal realm: the extent to which networks of friends and partner were mixed in terms of educational qualifications, and the extent to which this group was linguistically diverse. We found no statistically significant relationship between educational and linguistic diversity in the informal realm ($r=-.0323$, $P=.218$). Thus, while each item measures diversity of some kind, the low correlation suggests we cannot expect the items to form a cohesive scale of overall diversity. This is consistent with results of reliability testing, used to examine how well these two items could be combined to form one scale, which indicates that they cannot be combined to form an overall scale of diversity of informal networks with reliability or overall coherence. Rather, each item needs to be treated separately in analysis. This might not seem surprising, since education and language diversity are substantively different, yet is at odds with some previous social capital research which groups different types of measures of diversity into one measure (see, for example, Narayan and Cassidy 2001).

In sum, analysis of social capital within informal networks generally indicates support for our measures and framework. Specifically, examination of overall relationships between items using bivariate correlations, plus reliability testing of composite measures for norms and networks in the informal realm, indicate we can talk about informal social capital norms, as well as the size of informal networks (albeit with less statistical reliability), and that these two components differ from both the density and diversity of informal networks, respectively.

Reflecting these distinctions, Table 2 presents the final measures (5 items) to be used in analysis of social capital in informal life in analysis presented in the remainder of this paper.

<i>Measures of informal social capital</i>	Mean	Standard deviation
Informal social capital norms (4 items, on 0 to 10 scale) <i>Trust in family</i> <i>Reciprocity within family</i> <i>Trust in friends</i> <i>Reciprocity among friends</i>	8.26	1.39
Size of informal networks (4 items, actual number reported) (<i>family, friends, work, neighbours</i>)	62	43
Density of friendship networks ¹ (individual item, on 0 to 10 scale)	7.60	1.45
	Frequency	Valid Percent
Educational diversity		
<i>Same</i>	19.5	20.1
<i>Somewhat mixed</i>	58.7	60.5
<i>Very mixed</i>	18.8	19.4
Linguistic diversity		
<i>Same</i>	61.8	62.3
<i>Somewhat mixed</i>	16.7	16.8
<i>Very mixed</i>	20.7	20.8

Notes: 1. Where the focus of analysis is upon respondents with family in the household, this item can be supplemented by a measure of the extent to which family members know one another's close friends.
Source: Families, Social Capital & Citizenship survey, Australian Institute of Family Studies, 2001.

Generalised realm

Generalised social capital relates to the sense of trust and reciprocity that exists between people within a local area, and among people in general. We asked about these norms, as well as the extent to which respondents were connected with civic

groups – often argued to be a conduit to generalised trust. In addition, the survey measured diversity by asking about the different types of groups respondents belonged to, and about the educational and linguistic diversity of group members. While these three group-based diversity items are not included in analyses presented in the remainder of this paper, as they were only asked of those who were members of groups or organisations, here we examine the relationship between all items to see how they might be included in future analyses. One further – and universal – measure of diversity included throughout the paper is a measure of the extent to which people in respondents' local area share the same values.

The pattern we found among these elements of social capital within the generalised realm mirrored that for informal networks to a large extent. Initial analysis of bivariate correlations (Pearson's two-tailed test) indicated that the norms governing generalised social relations are positively correlated with one another (ranging between $r=.35$ and $r=.65$), but only one of these items had a statistically significant (although very weak) relationship with the number of civic/formal groups respondents were members of, and there was little relationship between measures of norms and measures of diversity (see Appendix B.2 for results). These results also indicated a strong positive correlation between the trust and reciprocity items (particularly reciprocity in the local area) and the extent to which local people share the same values.

As in the previous analysis of informal social capital, we used reliability testing to determine how well our measures of each aspect of social capital within the generalised realm (norms, network size, and diversity) formed scales. As in the case of informal norms of social capital, we found the trust and reciprocity items in the generalised realm scaled together with high overall reliability ($\alpha=.78$, standardised $\alpha=.79$) and unidimensionality, as shown in Table 3.

The survey included a measure of the number of different types of groups and organisations respondents were members of, two measures of the diversity of group members (useful for studies of civic engagement), as well as a measure of the extent to which people in respondents' local area share the same values. These can all be understood as measures of the level of diversity in respondents' communities. Although only the last of these measures will be included in analyses in the remainder of this paper, because the group based measures are not universal, it is still useful to consider how well all these items scale together. Interestingly, as Table 3 shows, we found that none of these items grouped together reliably to form an overall scale of diversity. Indeed, the lack of

Table 3. Reliability testing of scales of social capital in the generalised realm

<i>Scales and scale items</i>	Alpha (Standardised alpha)	Item-total correlation
Generalised social capital (4 items; n=1,394)	.78 (.79)	-
<i>Trust in people around here (local area)</i>		.62
<i>Reciprocity among people around here (local area)</i>		.60
<i>Trust in people in general</i>		.55
<i>Reciprocity among people in general</i>		.61
Diversity of generalised relations (3 items; n=1,0731 ¹)	.003 (-.07)	-
<i>Diversity of values in local area²</i>		.02
<i>Number of group types respondent belongs to</i>		.05
<i>Educational diversity of group members</i>		-.08
<i>Linguistic diversity of group members</i>		-.02

Notes: 1. sub-sample of respondents who belonged to at least one group or organisation. 2. This item is reverse coded, where 0 = high diversity and 10 = no diversity.

Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

underlying commonality between the diversity of groups/group membership measures found here is similar to that between measures of educational and linguistic diversity in the informal realm.

In sum, we found support for the idea that an overall scale of generalised norms can be formed reliably by combining four items measuring trust and reciprocity in the local area and broader community. We had only one measure of network size in this realm (number of associational ties), which is an item that stands alone as a measure of network size or connectedness in the civic realm. In contrast to the scale of generalised norms, when we attempted to form a scale of diversity in the generalised realm, we found our items could not be combined with any statistical reliability, and should be treated separately in analysis. We conclude on the basis of the above analysis that the items shown in Table 4 can be used in analysis of generalised social capital.

<i>Measures of generalised social capital</i>	Mean	Standard deviation
Generalised social capital norms (4 items, on 0 to 10 scale) <i>Trust in people around here (local area)</i> <i>Reciprocity among people around here (local area)</i> <i>Trust in people in general</i> <i>Reciprocity among people in general</i> <i>Number of group memberships (individual item, actual number)</i>	6.83	1.60
Diversity of values in local area ¹ (individual item, on 0 to 10 scale)	6.44	2.29

Notes: 1. This item is reverse coded, where 0 = high diversity and 10 = no diversity.
Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Institutional realm

Institutional ties include both the relationships people have with various institutions (such as with government, corporations, and the like), as well as the extent to which people know people within a range of institutional settings. The *Families, Social Capital and Citizenship* survey included ten items measuring trust (or confidence) in institutions. It also included nine items measuring whether or not respondents were connected personally to a range of institutions, which together inform on the extent, breadth and diversity of institutional ties.

Again, we first examined the bivariate correlations between individual items, before developing and testing scale-based measures of core elements of social capital in the institutional realm. Again, the overall pattern was similar as that found for both informal and generalised social capital. First, bivariate analysis indicated that for a few institutions there is a significant correlation between having personal ties to an institution, and levels of confidence in that particular institution (for example the church, unions, and to a lesser extent big business). However, the analysis also shows that while there are moderate, positive and significant relationships between many of the individual items on trust in institutions, there is not a strong relationship between ties to institutions (the nine institutional ties items), and levels of institutional confidence (the ten confidence items), when we consider “norms” and “ties” overall (see correlation table Appendix B.3).

When we considered the elements separately, reliability testing indicated the ten items measuring confidence, or trust, in institutions form a highly reliable and highly unidimensional scale, as indicated by the high overall alpha scores and item-total correlation statistics presented in Table 5.

Table 5. Reliability testing of scales of social capital in the institutional realm

<i>Scales and scale items</i>	Alpha (Standardised alpha)	Item-total correlation	Mean scale score (0 to 10)	Standard deviation
Institutional confidence (10 items; n=1,483)	.84 (.84)	-	5.10	1.56
<i>The legal system</i>		.55		
<i>The churches</i>		.44		
<i>The police</i>		.53		
<i>The media</i>		.52		
<i>Unions</i>		.34		
<i>Federal government</i>		.63		
<i>State government</i>		.68		
<i>Local government</i>		.63		
<i>The public service</i>		.59		
<i>Big business</i>		.50		
Institutional ties (9 items; n=1,503)	.65 (.64)	-	3.36	2.17
<i>The legal system</i>		.44		
<i>The churches</i>		.04		
<i>The police</i>		.31		
<i>The media</i>		.38		
<i>Unions</i>		.24		
<i>Government</i>		.49		
<i>Political parties</i>		.42		
<i>Universities</i>		.35		
<i>Big business</i>		.30		

Source: Families, Social Capital & Citizenship survey, Australian Institute of Family Studies, 2001.

Similarly, we found that the nine institutional ties items combined to form a reliable scale which can be thought of as measuring both the size of respondents' institutional networks, as well as the breadth or diversity of these ties. Interestingly, as can be seen in Table 5, the item on ties to the church is most different from the other items, although it is nonetheless included in the combined scale, as a realm in which people can form significant institutional ties.

In sum, analysis of measures of institutional social capital followed a similar pattern to those of informal and generalised social capital. Specifically, we found that while there are overall differences in the extent to which respondents trust in institutions and are tied to them, there is little relationship between levels of trust and the extent of personal ties to various institutions. We found that, in contrast, items measuring trust in institutions and ties to institutions could form reliable scales of institutional trust and institutional ties, respectively (presented above).

Summary

Examination and testing of measures of social capital within informal, generalised and institutional relations, respectively, has provided considerable support for our framework. In particular, reliability testing has generally confirmed the reliability of our approach. We have constructed reliable and unidimensional scales of norms of social capital within each of the social realms, and constructed reliable measures of the extent and density of network ties where possible.

The exception to this general pattern concerns our measures of diversity. We have explored the relationship between several measures of diversity of network membership within both informal and generalised (group based and neighbourhood) realms. At each social scale we have found that rather than forming a cohesive scale, statistical testing shows our items to be quite different variables, which cannot be combined in a statistically reliable way. Within the

generalised realm, we also found a difference between group based measures of diversity and our measure of diversity within the local area – pointing to a further difference between personal networks and area-based relationships, that is worthy of further investigation. Given diversity is theoretically significant, we argue these some measures of diversity should be retained in subsequent analyses throughout this paper, but treated as separate items in analysis.

***Analytic technique 2:
An overall measure of social capital?***

Although measures of core elements of social capital within different types of network provide rich information about how each set of relationships predicts certain outcomes or is affected by other variables, working with multiple items can be cumbersome analytically, and results can be difficult to interpret. Often we want a way of working with one variable or a simple set of items. This practical rationale relates to a conceptual one, which is the question of whether we can talk about the “total” stock of social capital available to an individual or community. Inherently, this idea leads to thinking about an overall, composite measure of social capital.

One way in which previous studies have approached this question is to simply use one type of measure or one item as a measure of overall social capital. Most commonly a single measure of trust is used (see, for example, the work of Knack and Keefer 1997). The problem with this approach is that it fails to recognise that social capital is multidimensional (see Stone and Hughes 2000 for discussion). Measuring a multidimensional concept using only one measure is inherently limited both in terms of explanatory power as well as reliability.

An approach taken in other studies is to see whether various elements of social capital can cohere to form an overall social capital index (see, for example, the work of Onyx and Bullen 2000). Measuring multiple aspects of the concept of social capital and then determining how well an overall index can be constructed is an improvement on using a single item, since each element of the concept is measured in some way. However, there are also limitations with this approach. Most importantly, combining measures of the separate elements of social capital into one index prevents analysis of how the various parts of the concept interact (many of the interesting questions relating to social capital in fact concern the interaction of trust, network size, and so on). However, depending on the research context, distinguishing between dimensions may not be important.

Bearing this limitation in mind, in this section of the paper we address the question of how the various elements of social capital within different network types operate together – and whether they can form a reliable and meaningful singular measure of social capital. We do so in response to the need for practical, simple measures of social capital; as an overall test of the approach taken in some previous research; and as a further means of exploring and understanding how the various dimensions of social capital across different types of social realms relate to one another.

As in the previous sections, we first examined the bivariate correlations between the various dimensions of social capital at different social scales that were developed above, to gain insight into the relationship between variables. Table 6 presents results of Pearson’s correlation procedures, and shows the extent to which each of the individual social capital scales are correlated.

Results indicate a moderate level of correlation exists among each of the individual norms scales. There is a moderate and significant positive correlation between informal norms and generalised norms, a weaker correlation between informal and institutional norms, and a moderate relationship between

Table 6. Correlation table for measures of social capital in the informal, generalised and institutional realms

	Informal norms	Generalised norms	Institutional norms	Informal network size	Number associational ties	Number institutional ties	Educational diversity of informal ties	Linguistic diversity of informal ties	Diversity of values in local area	Density of informal ties
Informal norms	1.00 P=.									
Generalised norms	0.31 P=.000	1.00 P=.								
Institutional norms	0.23 P=.000	0.34 P=.000	1.00 P=.							
Informal network size	0.03 P=.185	0.13 P=.000	0.05 P=.059	1.00 P=.						
Number associational ties	-0.01 P=.796	0.06 P=.021	-0.01 P=.722	0.18 P=.000	1.00 P=.					
Number institutional ties	0.03 P=.273	0.08 P=.002	0.10 P=.000	0.38 P=.000	0.29 P=.000	1.00 P=.				
Educational diversity of informal ties	0.00 P=.922	-0.01 P=.774	-0.02 P=.345	0.00 P=.892	0.02 P=.499	0.04 P=.173	1.00 P=.			
Linguistic diversity of informal ties	-0.07 P=.008	-0.10 P=.000	-0.03 P=.238	-0.01 P=.636	0.10 P=.000	0.06 P=.013	-0.03 P=.218	1.00 P=.		
Diversity of values in local area ¹	0.19 P=.000	0.64 P=.000	0.24 P=.000	0.05 P=.072	-0.02 P=.421	0.00 P=.912	0.03 P=.327	-0.13 P=.000	1.00 P=.	
Density of informal ties	0.09 P=.000	0.07 P=.007	0.07 P=.005	0.11 P=.000	0.09 P=.001	0.09 P=.000	-0.04 P=.135	-0.03 P=.266	0.05 P=.070	1.00 P=.

Notes: 1. This item is reverse coded, where 0 = high diversity and 10 = no diversity.
Source: *Families, Social Capital & Citizenship survey*, Australian Institute of Family Studies, 2001.

generalised norms and institutional confidence. Similarly, we find that the network size items are generally significantly and positively correlated with one another, but that these items are not generally well correlated with either the norms or other network measures (density and diversity).

Table 6 results also show some relationships between individual items measuring one dimension of social capital, with items measuring another social capital dimension. Most notably, we can see that the extent to which people in the local area share values (a measure of diversity at the generalised level) is strongly and positively related to levels and trust and reciprocity at the same level ($r=.64$, $P=.000$). This means, the more similar attitudes are, the higher are reported measures of trust and reciprocity.

To examine further the underlying structure of the data we used factor analysis, with principal components method of extraction. Principal components identifies groups of items that “go together” without making assumptions about correlations between individual items, and is suited to testing how well such items cohere. Using this method we found that rather than forming one cohesive component, the items grouped into three principal components. Using direct oblimin rotation (a method for making individual factors more clear), these groupings became interpretable. Most notably, rather than grouping according to type of network – for example, informal norms grouping with informal network size – we found that measures of the key elements or dimensions of social capital *generally* grouped together to form principal components which cut across network boundaries (where measures of one dimension were available across different social realms).

The first principal component was norms based, the second grouped together items measuring the size of social networks. Three items, measuring the density, educational and linguistic diversity of informal networks respectively, grouped together to form a third component, although this component was weak (eigenvalue = 1.09717). Together, these principal components accounted for 47.2 per cent of variance. A full statistical report is presented on Appendix C1, and is summarised in Table 7.

Two key points emerge from these findings. First, results of factor analysis provide support for the notion of separate dimensions of social capital, as set out in the conceptual framework at Figure 1. Most notably, norms of trust and reciprocity group together across separate spheres (informal, generalised and institutional) and are included in one principal component. Similarly, measures of network size clearly group together indicating this is a conceptually distinct dimension of social capital. Measures of diversity within informal networks also group together within the third principal component (although these are negatively related).

The second point that emerges from this analysis, however, is that there are “exceptions” to this general pattern. Table 7 results indicate, for example, that the measure of diversity of values within a local area groups together with trust and reciprocity items (reflecting the strong, positive correlation between similarity of local values with trust and reciprocity in the local area, noted earlier). Density of informal ties groups together with measures of informal network diversity, reflecting a correlation between the extent to which friendship networks are dense, and the extent to which they are linguistically diverse (although not educationally diverse).

Interestingly, each of these examples represent types of relationships between separate social capital dimensions we might expect to find, based on social capital theory. For example, within a local area, heightened levels of trust and reciprocity are those aspects of relationships argued to enable cooperative action for mutual benefit, and it is equally likely that the identification of shared values facilitates

the formation of trusting, reciprocal relationships. With regard to density and linguistic diversity, it is also likely that within homogenous language groupings, dense ties form (representing the “bonding” form of social capital).

In this way, we argue the coherence of items across dimensions of social capital (as defined at Figure 1) in these factor analysis results lends support to some of the hypothesised relationships between dimensions of social capital⁸. However, it is important to acknowledge that an alternative interpretation of these findings might be that an overall measure of social capital could be constructed that includes norms and values, combining trust and reciprocity as well as homogeneity of values within networks (as is sometimes the case in social capital measurement). Similarly, one could conclude that diversity and density items could be combined in some way.

Having identified these principal components, we next used pre-scale testing to examine the overall reliability of each of the components as a scale, as well as their underlying unidimensionality. This analysis allows us to better understand the relationship between items within each component identified in the previous analysis.

As discussed above, while results of factor analysis indicate the generalised diversity item about shared norms coheres with trust and reciprocity items across social spheres, for the purposes of scale testing, this item is treated as a measure of diversity and is not included in the overall trust and reciprocity scale. Similarly, given our argument that network density is conceptually distinct from network diversity, we do not scale these items together. Hence, Table 8 presents the results of scale construction and reliability testing of network norms and network size (reflecting principal components 1 and 2, above).

As in the previous section, the alpha scores are used to test whether the groupings of individual social capital items found in factor analysis form reliable scales, first

Table 7. Results of principal components analysis showing core dimensions of social capital

<i>Principal Component</i>	<i>Factor loading</i>	<i>Eigenvalue</i>	<i>Pct. of Variance</i>	<i>Cumulative Pct.</i>
1 "Norms" <i>Informal trust & reciprocity</i> <i>Generalised trust & reciprocity</i> <i>Institutional trust & reciprocity</i> <i>Diversity of values in local area</i> ¹	.54799 .82474 .57854 .75989	2.05721	20.6	20.6
2 "Network size" <i>Number informal ties</i> <i>Number group memberships</i> <i>Number institutional ties</i>	.70122 .62807 .78659	1.56947	15.7	36.3
3 "Density and diversity" <i>Friends know one another</i> <i>Educational diversity of informal networks</i> <i>Linguistic diversity of informal networks</i>	.45355 -.71751 .49106	1.09717	11.0	47.2

Notes: 1. This item is reverse coded, where 0 = high diversity and 10 = no diversity.
Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

⁸ As a further check on the underlying relationships between variables in the data, a separate factor analysis was also performed which included all items in their original form, rather than being based on the scales and items developed in the previous sections. Results are similar to those for the factor analysis based on scale items reported here, although also highlight a difference between trust and reciprocity within family and friendship groups, as well as a relationship between the density and size of friendship networks. Results are reported at Appendix C2.

Table 8. Reliability testing of overall measures of social capital

<i>Scales and scale items</i>	Alpha (Standardised alpha)	Item-total correlation	Mean scale score (0 to 10)	Standard deviation
<i>First principal component: Norms of trust and reciprocity (3 items; n=1,405)</i>	.52 (.52)	-	6.78	1.11
<i>Informal social capital</i>		.28		
<i>Generalised social capital</i>		.38		
<i>Institutional social capital</i>		.22		
<i>Second principal component: Network size (3 items; n=1,476)</i>	.11 (.55)	-	2.88	1.63
<i>Number informal ties</i>		.32		
<i>Number group memberships</i>		.38		
<i>Number institutional ties</i>		.22		

Source: Families, Social Capital & Citizenship survey, Australian Institute of Family Studies, 2001.

of social capital norms and next of network size. The item-total correlation statistics are used to determine the unidimensionality of the scales, and the mean and standard deviation are useful for assessing the likely usefulness of each scale (a scale which distinguishes well between different people is best).

The test scores presented in Table 8 indicate that the measures of norms of trust and reciprocity at each of these network types cohere, with a moderate level of statistical reliability. Similarly, results indicate that individual survey items relating to the extent of network ties at each of these network types cohere, again with moderate statistical reliability. One of the items, institutional ties, exhibits lower item-total correlation than the other items, indicating moderate scale unidimensionality.

In summary, this section of the paper has explored the question of whether we can combine the measures of various elements of social capital, across different types of social realms, to form one reliable and robust measure of social capital. As can be seen in the conceptual framework set out at the beginning of this paper, social capital is a multidimensional concept that features in a variety of ways within the different realms of people's lives. Given this, our expectation before exploring whether we could construct a single social capital index was that it does not make conceptual or statistical sense to do so (although note this does not mean that particular items will not be more useful than others – and might therefore be able to be used as indicators of social capital, an issue discussed in the conclusion of this paper).

Despite this, we investigated empirically how well our items of the core elements of social capital group together to form an overall measure. In doing so, we found through principal components analysis that rather than forming a cohesive measure, our items grouped into several principal components. While in part this confirms our expectation that all items might not cohere to form one index of social capital, it also indicated two other scales may be useful when considering "overall" social capital measures. Specifically, we found that measures of norms of trust and reciprocity from different spheres cohere into one principal component and form a relatively reliable measure of overall social capital norms. Analysis also identified a measure of the overall extent or size of respondents' networks *across* many spheres of life.

Additionally, the analysis highlighted other relationships between various items used to measure specific dimensions of social capital. As discussed above, in relation to generalised social capital, the extent to which values are shared or diverse in a local area appears positively correlated with levels of trust and reciprocity in those areas. In the informal realm, the density of friendship networks is related to the extent of linguistic diversity in those networks such that the higher the level of linguistic diversity, the more dense networks are likely to be.

Most importantly, we do not find support for the idea that we can readily measure social capital using *one* index. Rather, if anything, results of analysis suggest we can think about *composite measures of key dimensions of social capital*, that cross-cut the many spheres of informal, general and institutional life. To further test the quality of these measures, the composite measure of overall network norms, and network size, respectively, are subjected to validity testing later in this paper.

Analytic technique 3: A typology-based approach to measuring social capital

The measures of social capital developed thus far are based on scaling methods that group variables according to the level of correlation between them. We found in the first section that trust and reciprocity, for example, can be grouped together *within* any given network type to form a range of social capital scales in different arenas. In the second section we found that these scales can subsequently be grouped to represent overall dimensions of social capital *across* network types (albeit with varying degrees of reliability).

A third, and different, approach to measuring social capital is now explored. This approach is based on grouping cases, or respondents, rather than variables. It focuses upon finding a natural structure among observations, or respondents, within a survey, based on a multivariate profile. The most useful technique for this approach is cluster analysis. Cluster analysis groups individuals or objects into the same cluster so that objects (respondents) in the same cluster are more like one another than they are like objects in other clusters (Hair et al. 1995: 421). Thus drawing on our network based measures of social capital, we use cluster analysis to attempt to identify sub-groups in the sample with a distinctive social capital profile.

This approach is driven by the expectation that we will find clusters of people with different network characteristics and whose levels of trust and reciprocity will vary by network type. In other words, they will have different strengths and weaknesses in respect to the different elements of social capital and the networks in which social capital can exist. For example, while we are interested in people who are high on all measures of social capital, and likewise those that are low on all measures of social capital, we are also interested in whether we can identify a cluster characterised by high informal social capital and low generalised social capital, or a cluster characterised by high levels of connectedness to particular social networks but low levels of trust and reciprocity within those networks. The advantage of this approach is that we can produce a single measure of social capital, which takes into account (and indeed highlights) the multidimensional nature of the concept.

When using cluster analysis one has to choose between several different measures of respondent similarity and several different methods for forming clusters. The similarity between profiles can be decomposed into three parts: shape – the pattern of dips and rises across the variables, scatter – the dispersion of scores around their average, and elevation (level or size) – the mean score of the case over all of the variables (Alderderfer and Blashfield 1984:23). Methods of cluster formation, which vary in the rules they use for forming clusters, should take into account the choice of measure of similarity used, among other things (Alderderfer and Blashfield 1984: 59-60).

Our approach was to conduct a series of hierarchical cluster analyses using different measures of respondent similarity and different methods of cluster formation.⁹ Because cluster analysis is sensitive to differing scales or magnitude among the variables we converted the variables into standardised z scores for the purposes of analysis (Hair et al. 1995: 434). Also, because cluster analysis is sensitive to outliers, cases with z scores in excess of + or – 3.3 on any of the variables were recoded on the variables so that their impact was reduced.

Given that, to our knowledge, this is the first time this analytic approach has been taken in social capital measurement, we had no hypotheses regarding the precise number of cluster groups that would emerge. However, it was expected that the number of clusters would exceed two or three given the many possible networks and arenas in which social capital can exist and the multi-dimensional nature of social capital.

After comparing results using different measures of respondent similarity and different methods of cluster formation we chose a four cluster solution using the Squared Euclidean distance measure of respondent similarity and the Within Group Average method of cluster formation. While it is difficult to choose between different cluster solutions since more than one method can derive meaningful yet different results, there were several reasons for our choice. First, the solution appeared to capture differences in patterns across the variables – the shape – as well as the magnitude of the values themselves. This seemed important in respect to capturing what a social capital typology can achieve above and beyond a scale based approach to social capital measurement.

Second, the solution fit some of our theoretical expectations about the types or “mixes” of social capital that would exist in the population, described further below. Third, in comparing results from several cluster solutions we found considerable overlap between the clusters formed in this solution and the clusters formed using other similarity measures and clustering methods. This reflects some degree of stability in the solution.

And finally, in respect to the number of clusters chosen, examination of the agglomeration schedule showed that a four cluster solution produced good differentiation between groups. While solutions from two to six clusters were possibilities, four clusters is also a manageable number for the purposes of analysis and illustration.

Table 9 presents, for each of the four cluster groups, the mean value on each of the ten social capital measures included in the cluster analysis. Beside the means are listed the univariate F ratios and levels of significance comparing the differences between the group means. As the table shows, all ten of the variables exhibit significantly different patterns across the clusters and thus each assist in interpreting and labelling the clusters.

Based on the cluster means, the four clusters were labelled as follows.

(1) Strong Norms, Civic Connections

The first cluster of respondents are characterised by high levels of trust and reciprocity across the board, a high level of civic and community group membership, but a relatively small informal network of family, friends, neighbours and work-mates. It is also notable that these respondents report

9 At least four different combinations of measure and method produced reasonable solutions with two to five clusters: (1) Squared Euclidean Distance measure with the Within Group Average method of cluster formation, (2) Squared Euclidean Distance measure with the Ward Linkage method of cluster formation, (3) Squared Euclidean Distance measure with the Complete Linkage method of cluster formation and (4) Cosine measure (a correlation based measure) with the Within Group Average method of cluster formation.

Table 9. Profile of social capital clusters

	Cluster				F Ratio	Overall Mean
	1 Strong norms, civic connections	2 Extensive connections, generalised norms	3 Informal only - social capital limited	4 Socially excluded - social capital poor		
Trust & recip in informal networks	8.7	8.5	8.2	7.6	25.9***	8.5
Generalised trust & reciprocity	7.4	7.2	5.7	5.5	141.7***	6.9
Institutional confidence	5.4	5.3	4.7	3.8	44.2***	5.2
Number of informal ties	52.3	131.0	45.7	39.9	480.2***	64.7
Number of group memberships	4.1	5.5	2.4	1.9	39.1***	3.9
Breadth of institutional ties	3.3	4.9	3.3	1.7	66.0***	5.7
Density of friendship network	5.3	6.1	7.6	1.8	110.1***	3.3
Educational diversity of friendship network	5.0	4.8	5.2	7.4	14.6***	5.2
Linguistic diversity friendship networkk	2.1	1.1	1.3	1.1	12.3***	1.7
Diversity of values in neighbourhood ²	2.8	3.5	5.0	5.3	88.9***	3.5
Number of cases	707	237	248	90		1284
Percent of cases	55	18	19	7		100

Notes: 1.*** indicates that the underlying coefficient is significant at the 1 per cent confidence level. 2. This item is reverse coded, where 0 = high diversity and 10 = no diversity.
Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

that their informal networks are ethnically diverse, but that people in their neighbourhood share the same values.

(2) Extensive Connections, Generalised Norms

The second cluster is characterised by high levels of connectedness across the board – to informal networks, organisations and institutions, as well as high levels of generalised trust and reciprocity. Indeed, these people appear to be “social capital rich” – they have extensive and quality relationships across the board. This cluster of respondents is also characterised by an informal network which is relatively homogenous in terms of both the ethnicity and level of education of its members.

(3) Informal Only – Social Capital Limited

The third cluster is characterised by a small, dense informal network governed by high levels of trust and reciprocity, but low levels of connectedness, trust and reciprocity beyond this in the neighbourhood and with community groups, organisations and institutions. Thus, trust and reciprocity in informal networks of familiars is not extended to people generally in the community, including strangers. This group of respondents also report that people in their neighbourhood do not share the same values.

(4) Socially Excluded – Social Capital Poor

This fourth and final cluster is characterised by low levels of connectedness, trust and reciprocity across the board- in informal networks, the wider community and with institutions. For this group of respondents informal networks are also sparse – that is, friends do not connect up or know each other. As with the social capital limited group, this group of respondents report that people in their neighbourhood do not share the same values.

Of the four clusters, at least two can be directly linked to theoretical expectations about the sorts of social capital profiles we might find in the population– the “socially excluded” cluster and the “social capital limited” cluster. The social capital literature suggests that sometimes strong ties and norms of trust and reciprocity may be limited to informal networks of friends and family which may potentially crowd out broader ties and obligations beyond that in the community; and in social capital terms, social exclusion can be defined as a dearth of all forms of capital – social, economic and human (a link which is tested in the following section which examines the predictors of cluster group membership).

What we can conclude from interpretation of the preceding four clusters is that the overall level and nature of social capital a person has can differ across different network types. That is, to understand the complexity of social capital, it is important to understand the various types of relationships people have in different spheres of their lives. We can draw this conclusion regardless of the difficulty of choosing between several possible cluster solutions, each somewhat different but potentially meaningful.¹⁰

To explain this point further, consider the fact that in comparing several different cluster solutions we consistently found a cluster of respondents whose social capital appeared to be limited to informal networks only, as well as a

10 In relation to this point, it is interesting to note that although we have used cluster analysis to explore the structure of our data, a cluster based approach may be most useful where researchers have some expectations regarding the nature of the clusters that will emerge, based on theory or previous research. This is because of the under-developed nature of the statistical theory surrounding clustering techniques and the need for the researcher to decide between several different but potentially meaningful cluster solutions. In an essentially deductive research process, where the cluster analysis is theoretically informed, it is a straightforward process to test the external validity of a cluster typology.

“socially excluded” social capital group – with few and low quality relationships across the board. For the socially excluded group of people social capital may adequately be described by single variables such as those developed in the previous section, where a person may score low on the composite norms scale as well as the overall connectedness scale. In contrast, a simple description of overall levels of connectedness, trust and reciprocity cannot properly represent people with high quality relationships within a tight informal network of friends and family but little connection beyond this to community groups, organisations and institutions. Nor can it represent other persons in our survey who report having high quality relationships in one sphere of life and weaker relationships in another.

People with high social capital in one arena and low social capital in another would be attributed with an “average” social capital score in a combined measure (such as in the previous section). While in some way an average based measure is useful (and in some cases might be sufficient), it provides us with limited analytical power. Where real differences in the nature of a person’s relationships in informal, formal and general realms are “averaged”, we are unable to identify which aspects of the social world are most influential for particular outcomes. For example, say we wanted to understand the relationship between child development and social capital, using a cluster based solution, we would be able to examine how different combinations and levels of social capital in a person’s life contribute to this outcome, whereas a score on a simple high–low continuum would tell us relatively little.

Validity and meaningfulness of the measures

We have developed three analytical approaches to measuring social capital and have explored the reliability of our measures above. The aim of this section is to examine how valid and meaningful they are. The true test of the validity of our measures will be in applying them to different types of detailed analyses in future papers. However, at this point we want to be as confident of their validity as possible.

One way of assessing the validity of our measures of social capital is by testing their relationship with other variables and assessing how well these relationships conform with theoretical expectations (Christakapoulou et al. 2001: 339-340). This is referred to as their external validity, predictive validity or, in the case of composite measures, their construct validity (de Vaus 1995: 56).

The literature suggests that social capital relates to a host of variables at the micro and macro level, as illustrated earlier (see Figure 1). For example, social capital is said to relate to individual and family wellbeing, including the access individuals and families have to other resources such as human and financial capital. At the macro level, social capital is said to be related to democracy, economic growth and social cohesion. In order to test the validity of our social capital measures, here we examine how our measures of social capital relate to just a few of the variables that are prominent in the social capital literature.

Although social capital can occupy different positions in any research design or conceptual model, depending upon the questions at stake, we treat social capital as the dependent variable for the purposes of validity analysis. For each of our social capital scales in separate network types as well as the overall measures, we identify which variables predict social capital levels. For our social capital typology, we use the same set of variables to predict membership in each of the four social capital cluster groups. This approach allows us at the end of this paper to further compare the three approaches to social capital measurement and assess, for example, how much power may be lost when a single measure of

social capital is relied on, and whether a typology based approach to social capital measurement manages to capture the meaningful differences between groups that can be found when using the set of social capital measures that produced it.

In order to do this we conduct a series of multivariate regression models. Ordinary least Squares Regression is used to predict social capital level for most of our social capital scales. Multinomial Logit Regression is used to predict the linguistic and educational diversity of informal networks, as well as membership in each of the four social capital cluster groups. The choice of statistical technique is based on the type of measurement of the particular social capital variable – that is, whether it has the qualities of categorical or interval level data.¹¹ The appropriateness of statistical techniques is also dependent on the linearity or non-linearity of the relationships between variables in the analysis. While we may include in our linear regression models a few variables which have non-linear relationships with social capital, in this paper we are not concerned with revealing or doing justice to the precise relationship each particular explanatory or predictor variable has with each of our social capital measures (we are not aiming to test specific theoretical models or specific hypotheses about the relationship each predictor variable has with social capital).

In each of the regression models we include explanatory or predictor variables which the literature suggests will be related to social capital or which previous empirical studies have shown to be important determinants of social capital. Summary statistics for these variables can be found in Appendix D, along with coding details.

Because we are not interested in testing specific hypotheses about the order or relative importance of the explanatory or predictor variables, all the predictor variables were entered in to the regression models simultaneously. This allows evaluation of the unique contribution of each predictor variable, controlling for the effects of the other variables in the model (Tabachnik and Fidell 1996: 591).

The remainder of this section provides a brief summary of results. The full results of the regression analyses can be found in Appendix D. The tables presented in this section simply specify the direction and the significance level of the regression co-efficients for each of the predictor variables. That is, in order to assess the validity of our social capital measures, the results presented below are limited to identifying *significant* predictors of social capital, and identifying the *nature* of the relationship between social capital and the predictor variables.

Validity of scales of social capital dimensions in separate realms

This section tests the validity of the scales of social capital within the three separate realms – informal, generalised, and institutional.

Informal realm

We have five social capital measures in the informal realm: the overall size or extensiveness of informal networks, the level of trust and reciprocity in informal networks, the density of informal networks, the educational diversity of informal networks and the linguistic diversity of informal networks. Tables 10a and 10b show that each of these measures is significantly related to several predictor variables. The tables also specify the nature of each of these relationships in terms of whether they are positively or negatively related.

11 Linear regression is appropriate for interval level or continuous outcome variables and Multinomial logit regression is appropriate for categorical outcome variables with more than two groups.

To summarise the results, we found that the level of trust and reciprocity in informal networks is predicted by sex, marital status, whether one has children living at home, ethnicity, health, voluntary activity, tolerance of ethnic diversity and knowledge of local affairs. For an example, at the individual level, those who have divorced or separated report lower levels of trust and reciprocity than do other people, and for an example at the neighbourhood level, being informed about local affairs is positively associated with trust and reciprocity in informal networks.

Moving on to other network characteristics, the extensiveness of informal connections is predicted by age, relationship status, the extent to which networks are made up of family, the extent to which networks are locally based, health, voluntary activity, satisfaction with the safety of one's neighbourhood and level of knowledge about local affairs. To take some examples at the individual and family level, those who are in a relationship (married or defacto) report having larger informal networks than those who are single, and those in excellent health report having larger informal networks than those who are not in good health. To take a few examples at the neighbourhood level, being satisfied with the safety of your neighbourhood and being informed about local affairs are both positively correlated with having large informal networks (and in particular, with knowing lots of your neighbours).

Table 10a. Norms, connections and density in the informal realm — the influence of expected predictors			
Variable	Trust and reciprocity	Ties or connections	Density
age ⁱ	+	–**	–**
male	–**	–	+
married	–*	+**	+
defacto	+	+**	+
separated or divorced	–**	–	–*
live with kid/s	–**	–	–
% network made up of family ⁱ	–	–**	–
% network within 30 minutes ⁱ	+	–**	+**
less than yr 12 qualifications	+	–	+
trade or apprenticeship qualified	+	+	+
tertiary qualified	–	–	–
in paid work	+	+	–*
unemployed	–	–	–*
retired	–	+	+*
home owner	+	+	–
language other than English	–**	–	+
excellent health	+*	+**	+**
poor health	–**	–	–
voluntary work in past year	–**	+**	+**
politically active in past year	–	+	–
tolerance of ethnic diversity ⁱ	+**	–*	–
live in a rural or remote area	+	+	+
safety of neighbourhood ⁱ	+	+**	+
knowledge of local affairs ⁱ	+**	+**	–
level of advantage of area ⁱ	+	–	+
N	1394	1408	1382
R Square	.1013	.1721	.0448
Adjusted R Square	.0847	.1570	.0272
Multiple R	.3183	.4148	.2117
F	6.1123	11.4185	2.5390

Notes: 1. + indicates that there is a positive relationship between the predictor variable and the social capital measure and – indicates that there is a negative relationship between the predictor variable and the social capital measure. 2. * indicates that the underlying coefficient is significant at the 10 per cent confidence level and ** indicates that underlying coefficient is significant at the 5 per cent confidence level. 3. i=interval (or continuous) variable. 4. Categorical explanatory variables with three or more categories were transformed into binary variables in order to estimate the model. See Appendix D for details.

Source: Families, Social Capital & Citizenship survey, Australian Institute of Family Studies, 2001.

The density of friendship networks – the extent to which friends overlap and know each other– is predicted by age, the extent to which networks are locally based, health and voluntary activity. Age is negatively associated with network density, while health, voluntary activity and the extent to which networks are locally based are all positively related to network density.

Multinomial Logit Regression was used to predict the linguistic and educational diversity of respondents' informal networks.¹² As multinomial logit model results are not straightforward to interpret, Table 10b presents the estimated marginal effects (full results of the regression analyses are provided in Appendix D).¹³ The marginal effect for an explanatory or predictor variable shows the effect of a change in the explanatory variable on the probability of being in each group. For continuous or interval level variables, the marginal effects show the change in the probability of being in a group arising from a one unit increase in the characteristic – holding all other variables at their average value. Alternatively, if the explanatory variable is a binary variable, the coefficient should be interpreted as the change in the probability of being in a group that results from an individual having a particular characteristic. The marginal effects for each binary variable sum to zero across the groups since each respondent is in one, and only one, group.

Considering first the effect of respondents' own linguistic background on the linguistic diversity of their informal networks, Table 10b shows those who speak a language other than English at home or with their family are 45 percentage points more likely than those from non-English-speaking backgrounds to have informal networks that are very linguistically diverse, and 39 percentage points less likely to have informal networks that are linguistically homogenous. This is not a surprising finding. However, it is also interesting that those of non-English-speaking backgrounds are no more likely than those of English-speaking backgrounds to have informal networks that are only somewhat diverse linguistically (see multinomial logit estimates in Appendix D.4 for details).

Table 10b also shows that the linguistic diversity of informal networks is related to age, relationship and marital status, the extent to which networks are made up of family, the extent to which networks are locally based, political activity and satisfaction with the safety of ones neighbourhood.

Finally, the extent to which respondents' informal networks are diverse educationally is also influenced by respondents' own level of education, but not in a straightforward or linear way. Those with the highest level of education are most likely to have educationally homogenous networks (that is, their partners and close friends also tend to be highly educated), and those with very low levels of education are the second most likely group to have educationally homogenous networks (that is, their partners and close friends also tend to be poorly educated). Results show that the educational diversity of informal networks is also related to age, labour force status, health, and, at the 10 per cent confidence level, whether the respondent speaks a language other than English at home or with their family. Although only significant at the 10 per cent confidence level, it is interesting to note that those who speak a language other than English report having more educationally homogenous networks than those who do not.

12 Multinomial Logit Regression is more appropriate than Ordinary Least Squares Regression when using categorical rather than continuous outcome variables. This is also the case when using ordered categorical outcome variables if the distribution of responses seriously departs from normality (Tabachnik and Fidell 1996:599).

13 The multinomial logit coefficients for a particular category are a function of the 'log odds ratio'.

Table 10b. Diversity in the informal realm — the influence of expected predictors (Marginal effects on multinomial logit estimates)

Variable	Linguistic diversity			Educational diversity		
	All the same Per cent	Somewhat mixed Per cent	Very mixed Per cent	All the same Per cent	Somewhat mixed Per cent	Very mixed Per cent
age ¹	0.3**	-0.2**	-0.04**	0.3**	-0.4**	0.1**
male	-0.4	0.2	0.1	0.4	2.0	-2.0
married	-2.0**	18.0**	-16.0**	-5.0	3.0	1.0
defacto	-15.0**	26.0**	-10.0**	-3.0	5.0	-2.0
separated or divorced	-1.0	-3.0	4.1	0.03	1.0	-1.0
live with kid/s	1.0	1.5	-2.9	-4.0	1.0	3.0
% network made up of family ¹	0.2**	-0.2**	-0.03**	0.1	-0.02	-0.03
% network within 30 minutes ¹	0.3**	-0.1**	-0.2**	-0.1	-0.02	0.1
less than yr 12 qualifications	-0.03	-4.0	4.0	13.0**	-30.0**	17.0**
trade or apprenticeship qualified	-3.0	-3.0	5.0	-8.0*	3.0*	6.0*
tertiary qualified	-4.0	-3.0	7.0	25.0**	-24.0**	-0.2**
in paid work	-3.0	0.4	2.0	-5.0**	-1.0**	6.0**
unemployed	-10.0	6.0	4.0	-1.0	-2.0	4.0
retired	-5.0	0.5	5.0	-5.0	6.0	-1.0
home owner	-2.0	2.0	0.3	-1.0	3.0	-2.0
language other than English	-39.0**	-6.0**	45.0**	7.0*	-2.0*	-5.0*
excellent health	-0.4	-1.0	2.0	7.0**	-4.0**	-3.0**
poor health	-8.0	2.0	6.0	0.0	-5.0	5.0
voluntary work in past year	-3.0	-1.0	3.0	2.0	-3.0	1.0
politically active in past year	-10.0**	4.0**	6.0**	-2.0	1.0	1.0
tolerance of ethnic diversity ¹	-2.0**	2.0**	1.0**	-0.1	-1.0	1.0
live in a rural or remote area	6.0	-2.0	-4.0	4.0	-3.0	-1.0
safety of neighbourhood ¹	3.0**	-1.0**	-2.0**	-0.2	0.1	0.1
knowledge of local affairs ¹	-1.0	1.0	0.5	0.1	0.5	-1.0
level of advantage of area ¹	-0.01	0.01	-0.004	0.01	-0.02	0.01

Notes: 1. * indicates that the underlying coefficient is significant at the 10 per cent confidence level and ** indicates that underlying coefficient is significant at the 5 per cent confidence level. 2. i=intercept (or continuous) variable. 3. For variables with more than two categories, omitted categories are: yr 12 qualification, not in the labour force, good health.

In sum, our measures of connectedness, trust and reciprocity in the informal realm appear to be related to other variables in a way that is consistent with the literature and with common sense.

These analyses also give support to the validity of our measures of the diversity of informal networks. However, it is important to note that our diversity measures are based on the characteristics of close network members which include each respondent's family, respondent's partner's family, and respondent's three closest friends. These close network members may not be representative of the respondent's wider informal network. It is also important to note that, because the measures of the diversity of the respondent's informal networks are related to respondent's own linguistic background and level of education (as we would expect), it would be best in future analyses if the diversity measures were used in conjunction with information on the respondent's own characteristics.

Generalised realm

We have three social capital measures in the generalised or civic realm: the number of group and associational memberships, the level of generalised trust and reciprocity, and the diversity of community values. Table 11 shows that each of these measures is also significantly related to several of our predictor variables.

Group and associational membership is predicted by the extent to which networks are made up of family, education, home ownership, health, voluntary activity, political activity and level of socio-economic dis/advantage of the area in which you live. To take some examples at the individual and family level, having tertiary qualifications and being a home owner are both positively associated with group and associational membership, as is voluntary activity and political activity. And to take an example at the neighbourhood level, the level of socio-economic advantage of the area is also positively associated with group and associational membership.

Moving on to norms of trust and reciprocity, level of generalised trust and reciprocity is predicted by age, relationship status, the extent to which networks are locally based, ethnicity, health, voluntary activity, tolerance of ethnic diversity, whether live in an urban or rural area, satisfaction with the safety of one's neighbourhood and level of knowledge of local affairs. To take some examples at the individual level, health and tolerance of diversity are positively associated with levels of trust and reciprocity; and for some examples at the neighbourhood level, living in a rural or remote area, being satisfied with the safety of one's neighbourhood or local area and being informed about local affairs are positively associated with generalised trust and reciprocity.

And finally, the diversity of values among people in one's neighbourhood or local area is predicted by relationship status, the extent to which networks are locally based, education, employment status, home ownership, ethnicity, voluntary activity, satisfaction with the safety of one's neighbourhood, level of knowledge of local affairs and level of dis/advantage of one's neighbourhood or local area.¹⁴

In sum, our measures of generalised social capital also appear to be related to other variables in a way that is consistent with the literature. This provides additional support for the validity of our measures of social capital in the broader community.

14 These relationships provide an example of the different types of approaches taken in social capital measurement. For example, sometimes voluntary activity and neighbourhood safety are used as measures of social capital, which might then be examined in relation to the extent of shared norms as either another measure of social capital, or as a desired outcome.

Table 11. Social capital in the generalised realm – the influence of expected predictors			
Variable	Trust and reciprocity	Group and associational memberships	Diversity of values in local area ⁵
age ⁱ	+	-	-
male	-	-	+
married	-	+	-
de facto	-	+	+
separated or divorced	-	+	+
live with kid/s	-	+	-
% network made up of family ⁱ	-	-	-
% network within 30 minutes ⁱ	+	-	-
less than yr 12 qualifications	+	+	-
trade or apprenticeship qualified	+	+	-
tertiary qualified	-	+	+
in paid work	-	-	+
unemployed	+	-	+
retired	-	-	+
home owner	+	+	-
language other than English	-	+	+
excellent health	+	+	-
poor health	-	-	+
voluntary work in past year	-	+	+
politically active in past year	-	+	+
tolerance of ethnic diversity ⁱ	+	+	-
live in a rural or remote area	+	-	-
safety of neighbourhood ⁱ	+	-	-
knowledge of local affairs ⁱ	+	+	-
level of advantage of area ⁱ	+	+	-
N	1403	1405	1313
R Square	.46090	.21242	.32431
Adjusted R Square	.45107	.19811	.31109
Multiple R	.67890	.46089	.56948
F	46.88773	14.8456	24.52788

Notes: 1. + indicates that there is a positive relationship between the predictor variable and the social capital measure and - indicates that there is a negative relationship between the predictor variable and the social capital measure. 1. i=interval (or continuous) variable. 2. * indicates that the underlying coefficient is significant at the 10 per cent confidence level and ** indicates that underlying coefficient is significant at the 5 per cent confidence level. 3. i=interval (or continuous) variable. 4. Categorical explanatory variables with three or more categories were transformed into binary variables in order to estimate the model. See Appendix D for details. 5. This item is reverse coded, where 0 = high diversity and 10 = no diversity.

Institutional realm

We have two measures of social capital in the realm of institutions: the level of respondents' institutional confidence and the breadth of institutional ties. Table 12 shows that each of these measures is significantly related to several predictor variables.

Institutional confidence is predicted by relationship status, the extent to which networks are locally based, ethnicity, health, voluntary activity, tolerance of diversity, whether live in an urban or rural area, satisfaction with neighbourhood safety and level of knowledge of local affairs. For examples at the individual level, health and tolerance of diversity are positively associated with institutional confidence; and for examples at the neighbourhood level, living in a rural or remote area, being satisfied with neighbourhood or local area safety and being informed about local affairs are positively associated with institutional confidence.

The breadth of institutional ties is predicted by relationship status, whether live with children, the extent to which networks are made up of family members, the extent to which networks are locally based, education, employment status, health, voluntary activity, political activity, tolerance of diversity and level of knowledge of local affairs. For some examples at the individual and family level, the breadth of institutional ties is positively related to health, level of education

Table 12. Institutional social capital – the influence of expected predictors

<i>Variable</i>	Institutional confidence	Institutional ties
age ⁱ	_*	-
male	-	+
married	-	+**
de facto	_*	+
separated or divorced	-	+
live with kid/s	+	_*
% network made up of family ⁱ	+	_*
% network within 30 minutes ⁱ	-	_*
less than yr 12 qualifications	-	_*
trade or apprenticeship qualified	+	+
tertiary qualified	-	+**
in paid work	-	+**
unemployed	-	-
retired	+	-
home owner	+	+
language other than English	-	-
excellent health	-	+*
poor health	_*	+**
voluntary work in past year	-	+**
politically active in past year	_*	+**
tolerance of ethnic diversity ⁱ	+**	+**
live in a rural or remote area	_*	+
safety of neighbourhood ⁱ	+**	-
knowledge of local affairs ⁱ	+**	+**
level of advantage of area ⁱ	+	+
N	1399	1405
R Square	.20151	.24733
Adjusted R Square	.18694	.23368
Multiple R	.4890	.49733
F	13.83234	18.12118

Notes: 1. + indicates that there is a positive relationship between the predictor variable and the social capital measure and – indicates that there is a negative relationship between the predictor variable and the social capital measure. 2. * indicates that the underlying coefficient is significant at the 10 per cent confidence level and ** indicates that underlying coefficient is significant at the 5 per cent confidence level. 3. i=interval (or continuous) variable. 4. Categorical explanatory variables with three or more categories were transformed into binary variables in order to estimate the model. See Appendix D for details.

and being in paid work, and also to voluntary activity, political activity and tolerance of diversity. For an example at the neighbourhood level, the breadth of institutional ties is positively related to level of knowledge of local affairs.

Thus our measures of social capital in the institutional realm appear also to be related to other variables in a way that is consistent with the literature, providing support for their validity.

Validity of overall social capital scales

We have two composite measures of social capital which cross-cut network types: overall level of trust and reciprocity and overall level of connectedness. The former combines our measure of trust and reciprocity in informal networks, our measure of generalised trust and reciprocity, and our measure of institutional confidence. The latter combines our measure of the size of informal networks, the extent of group and associational membership and the breadth of institutional ties (the measures of density and diversity at the informal and neighbourhood level were not formed into composite measures and thus validity testing is not duplicated here).

Table 13 shows that each of these combined measures is also significantly related to several of our predictor variables. Overall level of connectedness is predicted by age, relationship status, the extent to which networks are made up of family members, the extent to which networks are locally based, education, health, voluntary activity, political activity, satisfaction with the safety of your

Table 13. Overall measures of social capital—the influence of expected predictors

<i>Variable</i>	Trust and reciprocity	Ties or connections
age ⁱ	+	**
male	**	-
married	-	***
defacto	**	***
separated or divorced	**	-
live with kid/s	-	-
% network made up of family ⁱ	-	**
% network within 30 minutes ⁱ	+	**
less than yr 12 qualifications	+	-
trade or apprenticeship qualified	+	+
tertiary qualified	+	***
in paid work	-	+
unemployed	-	-
retired	+	-
home owner	**	+
language other than English	**	+
excellent health	+	***
poor health	**	-
voluntary work in past year	*	***
politically active in past year	**	***
tolerance of ethnic diversity ⁱ	**	+
live in a rural or remote area	+	+
safety of neighbourhood ⁱ	**	+
knowledge of local affairs ⁱ	**	***
level of advantage of area ⁱ	+	***
N	1382	1402
R Square	.36484	.31169
Adjusted R Square	.35302	.29917
Multiple R	.60402	.55829
F	30.87624	24.88070

Notes: 1. + indicates that there is a positive relationship between the predictor variable and the social capital measure and - indicates that there is a negative relationship between the predictor variable and the social capital measure. 2. * indicates that the underlying coefficient is significant at the 10 per cent confidence level and ** indicates that underlying coefficient is significant at the 5 per cent confidence level. 3. i=interval (or continuous) variable. 4. Categorical explanatory variables with three or more categories were transformed into binary variables in order to estimate the model. See Appendix D for details.

neighbourhood and level of knowledge of local affairs. To take some examples at the individual and family level, overall connectedness is positively related to being in a relationship (married or defacto), health, voluntary activity and political activity. For some examples at the neighbourhood level, overall connectedness is positively related to level of satisfaction with the safety of your neighbourhood or local area and level of knowledge about local affairs.

Overall levels of trust and reciprocity are predicted by sex, relationship status, marital status, home ownership, ethnicity, health, political activity, tolerance of diversity, satisfaction with the safety of your neighbourhood and level of knowledge of local affairs. At the individual level, health, home ownership and tolerance of diversity are positively associated with levels of trust and reciprocity; and at the neighbourhood level, being satisfied with the safety of your neighbourhood and being informed about local affairs are both positively associated with trust and reciprocity.

These patterns again appear to be consistent with the literature, providing support for their validity.

Validity of the social capital typology

In order to assess the validity of the social capital typology we identify which variables predict membership in each of the four social capital cluster groups: (1) “strong norms, civic connections”; (2) “extensive connections and generalised norms”; (3) “social capital limited – informal only”; and (4) “social capital poor

and socially excluded". We use multinomial logit regression to predict group membership, the appropriate statistical technique when there are more than two membership groups, and when there is a mix of categorical and interval level explanatory or predictor variables.

Again, Multinomial logit estimates of group membership are provided in Appendix D, and Table 14 simply presents the estimated marginal effects. Without discussing each of the various determinants of group membership in detail, the results presented in Table 14 provide support for the external or construct validity of our social capital typology. While it is not possible to compare our findings with previous empirical work as there is as yet no example of the cluster analytic approach being undertaken in social capital research, the findings make theoretical as well as intuitive sense.

For example, Table 14 shows that having poor health has a strong impact upon cluster group membership. Those who have poor health are estimated to be 2.9 percentage points more likely to be in the "social capital poor – socially excluded" cluster than those who do not have poor health, and 12.7 percentage points more likely to be in the "social capital limited" cluster. That is, those whose health are poor are more likely to either have social capital limited to a small informal network of friends and family, or to have low levels of connectedness, trust and reciprocity across the board – in the informal realm, in the wider community and in respect to relationships with institutions.

Table 14. Marginal effects on multinomial logit estimates of cluster group membership

Variable	Cluster			
	1 Strong norms, civic connections Per cent	2 Extensive connections, generalised norms Per cent	3 Sk limited – informal only Per cent	4 Sk poor – socially excluded Per cent
age ⁱ	0.1	0.02	-0.1	0.1
male	-6.1*	1.5*	4.3*	0.2*
married	-12.6**	8.1**	3.0**	1.4**
de facto	-16.5**	3.4**	11.2**	1.9**
separated or divorced	-9.3**	-1.7**	12.0**	-1.0**
live with kid/s	5.7	0.1	-3.3	-2.5
tertiary qualified	4.0	0.6	-4.1	-0.4
less than yr 12 qualifications	6.8*	-6.6*	-2.0*	1.8*
trade or apprenticeship qualified	3.1**	2.3**	-7.9**	2.6**
retired	10.5	-3.6	-3.4	-3.4
in paid work	-1.9	2.0	-1.5	1.4
unemployed	7.2	-4.1	-9.2	6.1
excellent health	-5.9**	7.9**	-0.1**	-2.0**
poor health	-13.0*	-2.5*	12.7*	2.9*
language other than English	9.1*	-4.7*	-4.4*	0.04*
home owner	12.8**	-0.7**	-8.6**	-3.5**
voluntary work in past year	-8.6**	11.2**	0.4**	-3.0**
politically active in past year	3.0	2.5	-4.1	-1.5
% network made up of family ⁱ	0.1**	-0.2**	0.1**	0.1**
% network within 30 minutes ⁱ	0.1**	-0.3**	0.2**	-0.004**
tolerance of ethnic/cult diversity ⁱ	2.7**	-0.4**	-2.1**	-0.2**
live in a rural or remote area	2.8	2.8	-4.9	-0.8
live in an outer metropolitan area	-3.8	7.9	-5.3	1.2
safety of neighbourhood ⁱ	4.0**	0.3**	-3.4**	-1.0**
knowledge of local affairs ⁱ	2.0**	0.4**	-1.5**	-1.0**
level of advantage of area ⁱ	0.02*	0.002*	-0.01*	-0.01*

Notes: 1. *indicates that the underlying coefficient is significant at the 10 per cent confidence level and ** indicates that underlying coefficient is significant at the 5 per cent confidence level. 2. i=interval (or continuous) variable. 3. For variables with more than two categories, omitted categories are: yr 12 qualification, not in the labour force, good health, lives in a capital city.

Source: *Families, Social Capital & Citizenship survey*, Australian Institute of Family Studies, 2001.

For a few examples at the neighbourhood or local community level, those who live in socio-economically disadvantaged neighbourhoods, those who perceive their neighbourhoods to be unsafe places to live, and those who are not well informed about local affairs are more likely to be social capital poor or to have social capital that is limited to a small dense informal network of friends and family. These findings are not surprising – in particular, a lack of neighbourhood safety is unlikely to encourage social or community engagement or high levels of trust and reciprocity among strangers and among people in general.

While only two of our four social capital clusters have been specifically linked to theoretical expectations about the sorts of social capital profiles we would find in the population – the “socially excluded” and the “social capital limited” clusters – the variables that predict membership in these two cluster groups do so in a way that is consistent with theoretical expectations. For example, if we use the predictor variables to create a profile of these clusters we find that the cluster of respondents we have labelled “socially excluded” appear to be not only poor in social capital, but also poor in economic capital and neighbourhood resources, as theory would suggest.

For the remaining two cluster groups – “strong norms, civic connections” and “extensive connections, generalised norms” – the variables found to predict membership in these groups make intuitive if not theoretical sense. For example, it makes sense that those in the “strong norms, civic connections” tend to be single and never married while those in the “high connections, generalised norms” cluster tend to be partnered (married or defacto).

In sum, these results provide considerable support for the external or construct validity of our social capital typology. A substantial number of the variables included in the estimation model have a significant impact upon cluster group membership, and the nature of these effects is generally consistent with our expectations based on theory and common sense.¹⁵

Comparing the three approaches

The validity analyses presented in this section have revealed that each of our three approaches to social capital measurement will produce social capital measures that are valid and meaningful. Our social capital scales – for informal, generalised and institutional realms and across these three realms – and our social capital typology, all appear to be related to other variables that are prominent in the social capital literature; and these relationships appear generally consistent in nature with theory and previous empirical work. However, a comparison of regression results across the three approaches indicates that social capital measures that collapse differences between the informal, general and institutional realms, and social capital typologies, will be most useful in some circumstances only.

In respect to our overall social capital measures that collapse differences between the informal, civic and institutional realms, these may be most useful when the key focus of interest is on a particular determinant or outcome of social capital that has a consistent relationship with social capital across all networks and social scales. For example, tolerance of diversity is positively related to levels of connectedness, trust and reciprocity across all network types and social scales.

But some of the variables identified above are positively related to social capital in one realm but unrelated or negatively related to social capital in another. For

15 Even those predictor or explanatory variables which were not significant in estimation models were mostly found to be significantly associated with the cluster typology in bivariate analyses.

example, living in an urban or rural area is positively related to trust and reciprocity in informal networks and negatively related to confidence in institutions. When the overall measure of trust and reciprocity is examined, there appears to be no urban/rural differences in social capital, as the relationships counter-act each other. Thus in such cases (for example, where one is interested in urban and rural differences) it is not appropriate to rely on social capital measures that collapse differences between the informal, general and institutional realms.

Also, validity testing has shown that a few of our social capital measures (specifically, the measures of the ethnic and educational diversity of informal networks) are closely related to the socio-demographic characteristics of the respondents (specifically, the respondents' own ethnicity and level of education). Including these measures in the cluster analysis may have resulted in a typology that has been unduly influenced by the socio-demographic characteristics of respondents.

However, regardless of these points, validity testing has shown that our social capital typology captures most of the meaningful differences between groups that are evident from analyses using the individual scales of social capital dimensions in the informal, civic and institutional realms. For example, membership in the cluster group which is low in social capital overall – the “socially excluded” cluster – is predicted by the same variables which predict low social capital on the scale based measures. And membership of the “social capital limited” cluster is predicted by the same variables which predict high levels of trust and reciprocity in the informal realm but low levels of trust and reciprocity beyond to the wider community, and low levels of connectedness overall. Thus while clustering based techniques are in their infancy, we feel they hold promise for future social capital research.

Summary and conclusions

The overarching aim of this paper has been to contribute to the process of developing and testing reliable, valid and meaningful measures of social capital. To this end, we have presented a theoretically informed conceptual framework which has guided our construction of social capital measures. The framework recognises social capital as being multidimensional, and existing within a range of networks and social scales.

We have developed three approaches to measuring social capital in this paper. First, we examined how well and to what extent we could produce reliable measures of the core dimensions of social capital in separate network types or realms – informal, generalised and institutional. Second, we examined to what extent these items could be “boiled down” into an overall social capital index. Third, we produced social capital typologies which group people according to similarities in their responses to our social capital measures, across various realms of their lives. In the final part of this paper we subjected each of these approaches to external validity testing, focusing on the question of whether the range of variables we identified as being likely predictors of social capital actually relate to our social capital measures in ways we might expect.

We have reached a number of conclusions which, collectively, provide early support for our conceptual and measurement framework, as well as the techniques used to construct measures of social capital in this paper. Yet at the same time the results of these analyses have raised questions about the empirical nature of the concept itself.

The first conclusion we can draw is that the measures of network norms and network characteristics that are presented in this paper are generally reliable and

valid. In respect to the network based measures we developed, we found that while the various measures of social capital within informal, generalised and institutional realms have varying degrees of reliability, most of these measures appear robust, and all have a good level of construct validity. The exceptions are measures of network diversity – an area of research we suggest needs greater attention in future work.

In respect to creating a single measure of social capital, we found that creating an overall index of social capital made no statistical (or substantive) sense, but that in some cases we could form measures of core elements of social capital which cut across network boundaries, and might be used as composite measures in future work, most notably of norms of trust and reciprocity and network size, respectively. We suggest these may form useful summary measures of social capital and be used in ways similar to that which a single, overall index of social capital might be used. Exploring the adequacy of an overall social capital index also served to highlight relationships between dimensions.

Finally, we also confirmed that using a cluster based approach to measuring social capital provides a way of summarising the elements of social capital in meaningful ways, while still creating a single measure which shows strong statistical validity.

A second conclusion we can draw is about the validity of our overall approach and the items and ideas we have included in our framework. Other recent and comprehensive frameworks for measuring social capital report similar types of relationships between items as those we have found here. A key example is the work of Narayan and Cassidy (2001), researchers who have also undertaken substantial conceptual work on measurement approaches to social capital. While different in some respects, the similarities between our own work and the work of Narayan and Cassidy (and some other researchers) is positive for the area of social capital measurement as a whole. It provides some evidence that a degree of measurement consensus is developing within social capital research.

Third, we have found confirmation of the usefulness and validity of constructing different types of measures of social capital, useful for application in different situations and with regard to different types of analytic questions. The measures we have constructed of aspects of social capital within respective network types provide the most detail and are most useful for analysis of particular phenomenon which are more relevant to one social realm or another. However, they are cumbersome in instances where we wish to include all dimensions of social capital across all types of social realms in a single analysis. In such instances, an overall, composite measure of a person's sense of trust and reciprocity, or of level of connectedness, might prove more useful as well as more practicable. On the other hand, using combined measures of dimensions of social capital such as norms or network size might be limited for some research questions, as these measures do not discriminate between different levels of social capital in respective realms or spheres. Where we wish to explore variation across aspects of social life in different realms within the lives of individuals, yet still work with a manageable measure, a social capital typology may be most valuable and informative.

Given each of these approaches to measuring social capital appears to have statistical validity (and are more or less statistically reliable), the question of which type of measure to employ in any given analysis will depend upon the nature of the research question at hand, and upon the detail and comprehensiveness of available data.

While we have found statistical support for particular social capital measures and support for the idea that social capital can exist in a range of network types,

the analysis presented in this paper also raises fundamental questions about the cohesiveness of the social capital concept itself. Specifically, we have found evidence throughout this paper that measures of norms, networks and network characteristics do not cohere readily to form an overall measure of social capital, but rather that differences exist between these core elements. This raises the question of whether we should think about social capital as a multidimensional concept, or whether we should think about the different dimensions or elements as conceptually distinct. For example, it may be that norms of trust and reciprocity account for some types of outcomes, but that having limited or extensive networks accounts for others. Dense networks in which many members of a network know one another may result in different types of outcomes again.

This point relates to a question raised at the outset of this paper, which is whether, in conceptualising and measuring social capital, it is sufficient to include only norms and networks, or whether other network characteristics must also be taken into account. In this paper we have developed measures of each of these.

This leads to a final, concluding comment, which is that in order to answer these questions, and in order to properly assess the validity and usefulness of each of the measurement approaches developed in this paper, the measures need to be used. Only via application to research questions in future work will we be able to more fully evaluate the quality of the measures presented here – as well as the overall empirical worth of the concept of social capital itself, for providing understandings of the complex interaction between social processes, social structures and other aspects of life.

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Appendix A. Imputing missing values for institutional confidence items

Linear Regression was used to impute missing values for the institutional confidence items before constructing the summative scale of institutional confidence. There were several reasons for imputing missing values in this way. First, there was a large number of missing values on the individual items – ranging from 1.7 per cent for confidence in the police force to 15.7 per cent for confidence in trade unions. If we used listwise deletion of missing values to construct a summative scale of institutional confidence it would result in a substantial proportion of missing values on the composite measure (24 per cent).

It would be inappropriate to exclude these cases from analysis not only because of the reduction in sample size that would result but also because these cases differ systematically from the other cases in the sample. Analysis showed that the probability of data being missing on these variables is a function of other variables in the data set – a pattern of missing values referred to as “missing at random” (King et al. 2001). For example, the probability that a case is missing on the item relating to confidence in trade unions depends on whether one is a member of a trade union. In these circumstances – where the probability of data being missing on these variables is a function of other variables in the data set – listwise deletion of missing values may produce biased parameter estimates.

According to King et al. (2001: 51), the best solution for dealing with missing values in these circumstances is to impute them using the other information in the data set. In order to do this we used STEPWISE Multiple Linear Regression to statistically choose which of a large set ($n=30$) of independent or predictor variables produce the best regression equation (using listwise deletion of missing values). We then used the predicted values to impute missing values. In deciding which predictors should remain in the final regression equation we used a liberal criteria for inclusion of predictors in the model – including variables with a probability level less than .15 for entry and .20 for exit (Bendel and Affi 1977; Tabachnik and Fidell 1996: 150).

The drawback of using linear regression for imputing missing values is that it tends to under-estimate the variance in the predicted values and produces standard errors that are too small, which can lead to biased estimates of quantities of interest (King et al. 2001). While this can be avoided by using Multiple Imputation methods, linear regression is satisfactory for the purposes of this paper, particularly as in our circumstances we only have missing data on the dependent variable. Multiple Imputation methods may be preferable in future analyses where the resulting variables are to be used as predictors.

Appendix B. Correlation tables for informal, generalised and institutional realms

Appendix B.1: Correlations among informal social capital items

Table B.1. Correlation table for informal social capital items											
	Trust in family	Trust in friends	Reciprocity in family	Reciprocity in friends	Number of family	Number of friends	Number workmates	Number neighbours	Density of friendships	Educ. Diversity	Linguistic diversity
Trust in family	1.00 P=.										
Trust in friends	0.33 P=.000	1.00 P=.									
Reciprocity in family	0.64 P=.000	0.25 P=.000	1.00 P=.								
Reciprocity in friends	0.25 P=.000	0.57 P=.000	0.31 P=.000	1.00 P=.							
Number of family	0.06 P=.019	-0.03 P=.300	0.05 P=.053	0.01 P=.710	1.00 P=.						
Number of friends	0.01 P=.811	-0.02 P=.410	0.01 P=.573	0.02 P=.481	0.30 P=.000	1.00 P=.					
Number workmates	0.01 P=.712	-0.01 P=.677	-0.01 P=.706	0.01 P=.765	0.13 P=.000	0.34 P=.000	1.00 P=.				
Number neighbours	0.05 P=.073	0.02 P=.538	0.04 P=.126	0.03 P=.323	0.20 P=.000	0.20 P=.000	0.10 P=.000	1.00 P=.			
Density of friendships	0.03 P=.215	0.12 P=.000	0.03 P=.187	0.13 P=.000	0.03 P=.193	0.15 P=.000	0.00 P=.851	0.01 P=.848	1.00 P=.		
Educ. Diversity	-0.04 P=.137	0.05 P=.041	-0.02 P=.463	0.03 P=.261	-0.02 P=.454	0.01 P=.768	-0.01 P=.761	0.06 P=.015	-0.04 P=.135	1.00 P=.	
Linguistic diversity	-0.06 P=.022	-0.05 P=.036	-0.04 P=.168	-0.05 P=.053	-0.03 P=.240	0.01 P=.718	0.06 P=.028	-0.09 P=.000	-0.03 P=.266	-0.03 P=.218	1.00 P=.

Source: *Families, Social Capital & Citizenship survey*, Australian Institute of Family Studies, 2001.

Appendix B.2: Correlations among generalised social capital items

Table B.2. Correlation table for generalised social capital items

	Trust in local people	Reciprocity among local people	Trust in people in general	Reciprocity among people in general	Number group memberships	Diversity values in local area ¹
Trust in local people	1.00 P=.					
Reciprocity among local people	0.65 P=.000	1.00 P=.				
Trust in people in general	0.42 P=.000	0.35 P=.000	1.00 P=.			
Reciprocity among people in general	0.39 P=.000	0.44 P=.000	0.65 P=.000	1.00 P=.		
Number group memberships	0.04 P=.098	0.05 P=.083	0.07 P=.008	0.03 P=.263	1.00 P=.	
Diversity values in local area ¹	0.56 P=.000	0.64 P=.000	0.38 P=.000	0.40 P=.000	-0.02 P=.421	1.00 P=.

Notes: 1. This item is reverse coded, where 0 = high diversity and 10 = no diversity.
Source: *Families, Social Capital & Citizenship survey*, Australian Institute of Family Studies, 2001.

Appendix B.3: Correlations among institutional social capital items

Table B.3. Correlation table for institutional social capital items (Part 1 of 3)

	Trust legal system	Trust churches	Trust police	Trust media	Trust unions	Trust fed. government	Trust state government	Trust local government	Trust public service	Trust big business
Trust legal system	1.0000 P=.									
Trust churches	.3082 P=.000	1.0000 P=.								
Trust police	.4349 P=.000	.3717 P=.000	1.0000 P=.							
Trust media	.3680 P=.000	.2713 P=.000	.3619 P=.000	1.0000 P=.						
Trust unions	.2410 P=.000	.1857 P=.000	.1824 P=.000	.2618 P=.000	1.0000 P=.					
Trust fed. government	.3854 P=.000	.3037 P=.000	.3562 P=.000	.3124 P=.000	.17901 P=.000	.0000 P=.				
Trust state government	.3699 P=.000	.2920 P=.000	.3561 P=.000	.3832 P=.000	.2986 P=.000	.6721 P=.000	1.0000 P=.			
Trust local government	.3564 P=.000	.3303 P=.000	.3504 P=.000	.3722 P=.000	.2353 P=.000	.5197 P=.000	.6568 P=.000	1.0000 P=.		
Trust public service	.3947 P=.000	.2948 P=.000	.3824 P=.000	.3607 P=.000	.3411 P=.000	.4177 P=.000	.4582 P=.000	.4667 P=.000	1.0000 P=.	
Trust big business	.3456 P=.000	.2515 P=.000	.3249 P=.000	.3564 P=.000	.1448 P=.000	.4609 P=.000	.3763 P=.000	.3354 P=.000	.3483 P=.000	1.0000 P=.

Table B.3. Correlation table for institutional social capital items (Part 2 of 3)

	Trust legal system	Trust churches	Trust police	Trust media	Trust unions	Trust fed. government	Trust state government	Trust local government	Trust public service	Trust big business
Ties to legal system	.0812 P=.002	.0027 P=.916	-.0289 P=.262	-.0108 P=.675	-.0070 P=.787	.0777 P=.003	.0754 P=.003	.0257 P=.319	.0045 P=.862	.0358 P=.165
Ties to the church	.0683 P=.008	.3795 P=.000	.0712 P=.006	.0120 P=.642	.0581 P=.025	.1211 P=.000	.1276 P=.000	.0998 P=.000	.0911 P=.000	.0578 P=.025
Ties to police	-.0102 P=.691	.0241 P=.350	.1026 P=.000	-.0302 P=.242	-.0045 P=.863	-.0261 P=.312	-.0439 P=.089	-.0156 P=.546	-.0320 P=.215	.0601 P=.020
Ties to media	.0805 P=.002	-.0053 P=.837	-.0300 P=.245	.0279 P=.280	.0220 P=.395	-.0152 P=.555	.0231 P=.370	.0079 P=.761	-.0033 P=.899	.0050 P=.848
Ties to unions	.0164 P=.525	-.0061 P=.812	-.0230 P=.372	.0192 P=.456	.3093 P=.000	-.0296 P=.251	.0290 P=.261	.0118 P=.648	.0575 P=.026	-.0308 P=.233
Ties to government	.0719 P=.005	.0136 P=.599	.0143 P=.579	-.0245 P=.343	.0389 P=.133	-.0024 P=.925	.0518 P=.044	.0624 P=.016	.0375 P=.147	.0483 P=.061
Ties to political parties	.0357 P=.166	.0481 P=.062	-.0615 P=.017	.0027 P=.916	.0288 P=.265	.0328 P=.204	.0661 P=.010	.0422 P=.102	.0319 P=.216	.0045 P=.860
Ties to university	.0427 P=.098	.0172 P=.506	-.0023 P=.930	.0033 P=.898	.0495 P=.056	.0271 P=.293	.0215 P=.405	.0134 P=.603	.0470 P=.069	.0162 P=.530
Ties to business	.1025 P=.000	.0207 P=.424	.0324 P=.210	.0296 P=.251	-.0169 P=.514	.0677 P=.009	.0506 P=.050	-.0079 P=.759	-.0077 P=.766	.1129 P=.000

Table B.3. Correlation table for institutional social capital items (Part 3 of 3)

	Ties to legal system	Ties to the church	Ties to police	Ties to media	Ties to unions	Ties to government	Ties to political parties	Ties to university	Ties to business
Ties to legal system	1.0000 P=.								
Ties to the church	.0696 P=.007	1.0000 P=.							
Ties to police	.2472 P=.000	-.0001 P=.997	1.0000 P=.						
Ties to media	.2755 P=.000	.0141 P=.584	.2346 P=.000	1.0000 P=.					
Ties to unions	.1195 P=.000	-.0185 P=.474	.1397 P=.000	.1238 P=.000	1.0000 P=.				
Ties to government	.3231 P=.000	.0383 P=.138	.2073 P=.000	.2227 P=.000	.2120 P=.000	1.0000 P=.			
Ties to political parties	.2799 P=.000	.0564 P=.029	.1779 P=.000	.2530 P=.000	.1927 P=.000	.4325 P=.000	1.0000 P=.		
Ties to university	.2295 P=.000	.0384 P=.136	.1021 P=.000	.2534 P=.000	.1471 P=.000	.2197 P=.000	.1933 P=.000	1.0000 P=.	
Ties to business	.2225 P=.000	-.0317 P=.219	.1640 P=.000	.1795 P=.000	.0905 P=.000	.2068 P=.000	.1421 P=.000	.2727 P=.000	1.0000 P=.

Source: *Families, Social Capital & Citizenship survey*, Australian Institute of Family Studies, 2001.

Appendix C: Principal components factor analysis for overall measures of social capital

Appendix C.1: Factor analysis using constructed scales of informal, generalised and institutional social capital

Table C.1.1. Initial Statistics from factor analysis using constructed scales of informal, generalised and institutional social capital

Variable	Communality	Factor	Eigenvalue	Pct of Var	Cum Pct
Informal social capital norms	1.00000 *	1	2.05721	20.6	20.6
Generalised social capital norms	1.00000 *	2	1.56947	15.7	36.3
Institutional confidence	1.00000 *	3	1.09717	11.0	47.2
Size of informal networks	1.00000 *	4	0.98556	9.9	57.1
Number group memberships	1.00000 *	5	0.92297	9.2	66.3
Institutional ties	1.00000 *	6	0.88196	8.8	75.1
Educational diversity of informal networks	1.00000 *	7	0.80381	8.0	83.2
Linguistic diversity of informal networks	1.00000 *	8	0.76001	7.6	90.8
Diversity of values in local area ⁵	1.00000 *	9	0.58869	5.9	96.7
Density informal networks	1.00000 *	10	0.33315	3.3	100.0

Notes: 1. Principal Components Analysis (PC). 2. Listwise deletion of cases with missing values. 3. Kaiser-Meyer-Olkin Measure of Sampling Adequacy=.604. 4. Bartlett Test of Sphericity=1379.23, Significance=.00. 5. This item is reverse coded, where 0 = high diversity and 10 = no diversity.
Source: Families, Social Capital & Citizenship survey, Australian Institute of Family Studies, 2001.

Table C.1.2. Factor Matrix from factor analysis using constructed scales of informal, generalised and institutional social capital

	Factor 1	Factor 2	Factor 3
Informal social capital norms	0.48415	-0.18524	0.25343
Generalised social capital norms	0.84112	-0.11529	-0.06137
Institutional confidence	0.55065	-0.06723	0.24244
Size of informal networks	0.26339	0.63923	-0.14237
Number group memberships	0.09408	0.62512	-0.04295
Institutional ties	0.21593	0.75316	-0.07876
Educational diversity of informal networks	0.03057	-0.0076	-0.7251
Linguistic diversity of informal networks	-0.25845	0.18436	0.43944
Diversity of values in local area ¹	0.75383	-0.23212	-0.14838
Density informal networks	0.22643	0.25055	0.44855

Notes: 1. This item is reverse coded, where 0 = high diversity and 10 = no diversity.
Source: Families, Social Capital & Citizenship survey, Australian Institute of Family Studies, 2001.

Table C.1.3. Final Statistics from factor analysis using constructed scales of informal, generalised and institutional social capital

Variable	Communality	Factor	Eigenvalue	Pct of Var	Cum Pct
Informal social capital norms	.33294 *	1	2.05721	20.6	20.6
Generalised social capital norms	.72453 *	2	1.56947	15.7	36.3
Institutional confidence	.36651 *	3	1.09717	11.0	47.2
Size of informal networks	.49826 *				
Number group memberships	.40147 *				
Institutional ties	.62009 *				
Educational diversity of informal networks	.52676 *				
Linguistic diversity of informal networks	.29389 *				
Diversity of values in local area ¹	.64416 *				
Density informal networks	.31524 *				

Notes: 1. This item is reverse coded, where 0 = high diversity and 10 = no diversity.
Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Table C.1.4. Pattern Matrix from factor analysis using constructed scales of informal, generalised and institutional social capital

	Factor 1	Factor 2	Factor 3
Informal social capital norms	0.54799	-0.10812	0.16342
Generalised social capital norms	0.82474	0.1044	-0.17691
Institutional confidence	0.57854	0.02275	0.16328
Size of informal networks	0.06111	0.70122	-0.07085
Number group memberships	-0.08243	0.62807	0.04451
Institutional ties	-0.00529	0.78659	0.01505
Educational diversity informal networks	-0.07348	0.1373	-0.71751
Linguistic diversity informal networks	-0.23226	0.03064	0.49106
Diversity of values in local area ³	0.75989	-0.01182	-0.27047
Density informal networks	0.21437	0.20914	0.45355

Notes: 1. OBLIMIN rotation 1 for extraction 1 in analysis 1 - Kaiser Normalization. 2. OBLIMIN converged in 7 iterations. 3. This item is reverse coded, where 0 = high diversity and 10 = no diversity.
Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Table C.1.5. Structure Matrix from factor analysis using constructed scales of informal, generalised and institutional social capital

	Factor 1	Factor 2	Factor 3
Informal social capital norms	0.54485	-0.06933	0.16445
Generalised social capital norms	0.8275	0.13524	-0.15795
Institutional confidence	0.58212	0.06311	0.17329
Size of informal networks	0.09608	0.69974	-0.02427
Number group memberships	-0.04952	0.62674	0.08421
Institutional ties	0.03533	0.7873	0.06622
Educational diversity informal networks	-0.07701	0.08678	-0.70965
Linguistic diversity informal networks	-0.22345	0.0507	0.48963
Diversity of values in local area ¹	0.7553	0.00959	-0.26004
Density informal networks	0.2318	0.2497	0.47034

Notes: 1. This item is reverse coded, where 0 = high diversity and 10 = no diversity.
Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Table C.1.6. Factor Correlation Matrix from factor analysis using constructed scales of informal, generalised and institutional social capital

	Factor 1	Factor 2	Factor 3
Factor 1	1		
Factor 2	0.05136	1	
Factor 3	0.01474	0.06515	1

Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Appendix C.2: Factor analysis using original informal, generalised and institutional social capital items

Table C.2.1. Initial Statistics for factor analysis using original informal, generalised and institutional social capital items

<i>Variable</i>	<i>Communality*</i>	<i>Factor</i>	<i>Eigenvalue</i>	<i>Pct of Var</i>	<i>Cum Pct</i>
Trust in family	1.00000 *	1	5.23938	21.0	21.0
Trust in friends	1.00000 *	2	2.5473	10.2	31.1
Reciprocity in family	1.00000 *	3	1.83859	7.4	38.5
Reciprocity in friends	1.00000 *	4	1.59546	6.4	44.9
Trust in local people	1.00000 *	5	1.15732	4.6	49.5
Reciprocity among local people	1.00000 *	6	1.10803	4.4	53.9
Trust in people in general	1.00000 *	7	1.05098	4.2	58.1
Reciprocity in people in general	1.00000 *	8	0.95428	3.8	62.0
Trust churches	1.00000 *	9	0.89142	3.6	65.5
Trust legal system	1.00000 *	10	0.86017	3.4	69.0
Trust police	1.00000 *	11	0.82748	3.3	72.3
Trust media	1.00000 *	12	0.81214	3.2	75.5
Trust Unions	1.00000 *	13	0.76617	3.1	78.6
Trust fed. government	1.00000 *	14	0.67486	2.7	81.3
Trust state government	1.00000 *	15	0.62473	2.5	83.8
Trust local government	1.00000 *	16	0.56869	2.3	86.1
Trust public service	1.00000 *	17	0.54227	2.2	88.2
Trust big business	1.00000 *	18	0.49824	2.0	90.2
Number of informal ties	1.00000 *	19	0.46027	1.8	92.1
Number group memberships	1.00000 *	20	0.44341	1.8	93.8
Number of institutional ties	1.00000 *	21	0.40333	1.6	95.5
Diversity values in local area ⁵	1.00000 *	22	0.32761	1.3	96.8
Educational Diversity	1.00000 *	23	0.29865	1.2	98.0
Linguistic diversity	1.00000 *	24	0.26618	1.1	99.0
Density of friendships	1.00000 *	25	0.24303	1.0	100.0

Notes: 1. Principal Components Analysis. 2. Listwise deletion of cases with missing values. 3. Kaiser-Meyer-Olkin Measure of Sampling Adequacy=.809. 4. Bartlett Test of Sphericity=8817.94, Significance=.00. 5. This item is reverse coded, where 0 = high diversity and 10 = no diversity.
Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Table C.2.2. Factor Matrix for factor analysis using original informal, generalised and institutional social capital items

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Trust in family	0.37213	0.17715	0.61685	0.12413	-0.44575	0.0887	-0.07247
Trust in friends	0.3364	0.374	0.51568	0.14086	0.43236	0.08981	0.06286
Reciprocity in family	0.31507	0.17258	0.62199	0.12584	-0.45901	0.0506	-0.04417
Reciprocity in friends	0.3024	0.33994	0.50663	0.20829	0.46106	0.0625	0.09923
Trust in local people	0.45809	0.58472	-0.29414	-0.1618	-0.05371	0.07423	0.06918
Reciprocity among local people	0.49206	0.62101	-0.22997	-0.12616	-0.00847	-0.0093	0.03459
Trust in people in general	0.55146	0.37552	-0.24324	0.00735	-0.09932	-0.08021	0.07589
Reciprocity in people in general	0.58458	0.39493	-0.16753	-0.04666	-0.14287	-0.07673	0.11132
Trust churches	0.51632	-0.17238	-0.00436	0.15421	0.06864	-0.09151	-0.06088
Trust legal system	0.56671	-0.32867	-0.03509	0.06965	-0.02508	-0.19289	-0.10859
Trust police	0.61747	-0.16478	0.07212	0.01506	0.12052	-0.24509	0.00571
Trust media	0.55279	-0.32878	0.02133	-0.01109	0.02632	-0.08716	0.06607
Trust Unions	0.38288	-0.25594	0.01219	0.14214	-0.20348	0.3448	0.19058
Trust fed. government	0.64173	-0.37357	0.011594	-0.07336	0.08434	0.0362	-0.12491
Trust state government	0.69307	-0.34094	-0.05618	-0.07765	0.07485	0.15966	0.01999
Trust local government	0.66892	-0.26886	-0.05079	-0.15112	0.01902	0.14	0.06203
Trust public service	0.61175	-0.30105	-0.04821	-0.01631	-0.07994	0.10286	0.13703
Trust big business	0.52913	-0.31281	-0.08509	-0.07186	0.0992	-0.06359	-0.19832
Number of informal ties	0.07736	0.1024	-0.25686	0.61712	-0.20915	-0.00295	-0.37553
Number group memberships	-0.01348	0.06774	-0.27564	0.53813	-0.02323	0.15402	0.26421
Number of institutional ties	0.09116	0.00959	-0.29173	0.70648	0.04916	0.1386	-0.0473
Diversity values in local area ¹	0.48478	0.54524	-0.25364	-0.22484	0.01238	-0.00687	-0.0343
Educational Diversity	-0.02911	0.02117	-0.06847	-0.07383	0.26992	0.75561	-0.18816
Linguistic diversity	-0.10834	-0.18153	-0.02281	0.13041	-0.03336	-0.03007	0.78741
Density of friendships	0.14865	0.07242	0.05263	0.35389	0.32108	-0.39965	-0.04472

Notes: 1. This item is reverse coded, where 0 = high diversity and 10 = no diversity.

Source: Families, Social Capital & Citizenship survey, Australian Institute of Family Studies, 2001.

Table C.2.3. Final Statistics for factor analysis using original informal, generalised and institutional social capital items

<i>Variable</i>	<i>Communality*</i>	<i>Factor</i>	<i>Eigenvalue</i>	<i>Pct of Var</i>	<i>Cum Pct</i>
Trust in family	.77759 *	1	5.23938	21	21
Trust in friends	.73776 *	2	2.5473	10.2	31.1
Reciprocity in family	.74696 *	3	1.83859	7.4	38.5
Reciprocity in friends	.73340 *	4	1.59546	6.4	44.9
Trust in local people	.67763 *	5	1.15732	4.6	49.5
Reciprocity among local people	.69793 *	6	1.10803	4.4	53.9
Trust in people in general	.52641 *	7	1.05098	4.2	58.1
Reciprocity in people in general	.56664 *				
Trust churches	.33690 *				
Trust legal system	.48490 *				
Trust police	.48847 *				
Trust media	.42691 *				
Trust Unions	.42906 *				
Trust fed. government	.58104 *				
Trust state government	.63727 *				
Trust local government	.56897 *				
Trust public service	.50321 *				
Trust big business	.44345 *				
Number of informal ties	.64806 *				
Number group memberships	.46441 *				
Number of institutional ties	.61649 *				
Diversity values in local area ²	.64856 *				
Educational Diversity	.69064 *				
Linguistic diversity	.68425 *				
Density of friendships	.42017 *				

Notes: 1.OBLIMIN rotation 1 for extraction 1 in analysis 1 - Kaiser Normalization. 2.OBLIMIN converged in 11 iterations. 2. This item is reverse coded, where 0 = high diversity and 10 = no diversity.
Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Table C.2.4. Pattern Matrix for factor analysis using original informal, generalised and institutional social capital items

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Trust in family	0.00393	0.01361	0.85664	-0.00584	0.11785	-0.03991	-0.07098
Trust in friends	-0.0061	0.08502	0.1642	-0.06938	0.80631	0.12713	0.00667
Reciprocity in family	-0.03863	-0.00859	0.85248	-0.01755	0.10419	-0.08416	-0.04418
Reciprocity in friends	-0.00721	0.0331	0.13168	-0.02143	0.83034	0.0938	0.05045
Trust in local people	-0.07582	0.83993	-0.03279	-0.00307	-0.01166	0.08108	0.00307
Reciprocity among local people	-0.06984	0.83323	-0.01607	-0.00264	0.07579	0.00659	-0.04193
Trust in people in general	0.12404	0.66087	0.02701	0.10583	-0.02346	-0.10104	0.03811
Reciprocity in people in general	0.11954	0.67959	0.10576	0.03144	-0.01593	-0.10829	0.06578
Trust churches	0.51124	0.0245	0.02382	0.13718	0.10275	-0.08276	-0.0392
Trust legal system	0.65979	-0.02705	0.0345	0.06835	-0.05201	-0.18131	-0.08095
Trust police	0.59066	0.08179	0.00388	-0.05484	0.16731	-0.21631	-0.0043
Trust media	0.63837	-0.02371	0.02073	-0.04463	0.01749	-0.08406	0.08865
Trust Unions	0.38127	-0.03959	0.24114	0.16879	-0.10226	0.25148	0.26397
Trust fed. government	0.76824	-0.02931	-0.01435	-0.04019	0.00713	0.08413	-0.09588
Trust state government	0.76418	0.0555	-0.01684	-0.03235	0.01191	0.1846	0.05477
Trust local government	0.68498	0.1339	0.01424	-0.10313	-0.02631	0.15633	0.08252
Trust public service	0.63275	0.07519	0.0849	0.00706	-0.07514	0.07249	0.17633
Trust big business	0.6623	-0.00529	-0.08975	-0.02018	-0.02769	0.00231	-0.18081
Number of informal ties	-0.0387	0.04148	0.13575	0.74511	-0.14405	-0.06129	-0.30616
Number group memberships	-0.10931	0.06959	-0.07294	0.56648	0.02159	0.0535	0.33027
Number of institutional ties	0.04478	-0.02684	-0.07611	0.77054	0.075	0.07674	0.03893
Diversity values in local area ¹	-0.00102	0.79617	-0.06789	-0.07709	0.02399	0.03658	-0.11236
Educational Diversity	0.01607	-0.04213	-0.12962	0.08223	0.15122	0.82926	-0.15147
Linguistic diversity	-0.04021	-0.08498	-0.07934	-0.02596	0.01811	-0.158	0.81688
Density of friendships	0.10733	-0.04145	-0.16133	0.21858	0.39163	-0.36197	-0.0633

Notes: 1. This item is reverse coded, where 0 = high diversity and 10 = no diversity.

Source: Families, Social Capital & Citizenship survey, Australian Institute of Family Studies, 2001.

Table C.2.5. Structure Matrix for factor analysis using original informal, generalised and institutional social capital items

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Trust in family	0.18451	0.17288	0.86821	-0.01819	0.22782	-0.02447	-0.04001
Trust in friends	0.11197	0.24879	0.27629	-0.03601	0.8222	0.05255	-0.03099
Reciprocity in family	0.13576	0.13455	0.85041	-0.03043	0.20855	-0.06361	-0.01773
Reciprocity in friends	0.09899	0.1966	0.23794	0.01479	0.83647	0.01553	0.01135
Trust in local people	0.12638	0.81432	0.0874	0.04032	0.11689	0.09457	-0.02576
Reciprocity among local people	0.14202	0.82795	0.10917	0.04669	0.21645	0.00718	-0.08114
Trust in people in general	0.30463	0.69617	0.14911	0.1614	0.12098	-0.09507	0.0175
Reciprocity in people in general	0.31762	0.72174	0.23343	0.08854	0.13597	-0.09282	0.04314
Trust churches	0.54045	0.18436	0.13216	0.17786	0.17326	-0.11752	-0.02585
Trust legal system	0.66107	0.14064	0.14155	0.111	0.03372	-0.20291	-0.06212
Trust police	0.62901	0.25478	0.14483	0.0078	0.25565	-0.24561	-0.01667
Trust media	0.64077	0.13643	0.14667	0.00372	0.07392	-0.09185	0.1039
Trust Unions	0.42349	0.08066	0.31757	0.1789	-0.08269	0.27391	0.32835
Trust fed. government	0.75037	0.1657	0.13251	-0.00382	0.06344	0.05662	-0.06208
Trust state government	0.77115	0.24604	0.15444	0.01132	0.06282	0.17008	0.09378
Trust local government	0.71184	0.29678	0.17966	-0.05878	0.03289	0.15688	0.1133
Trust public service	0.66691	0.22972	0.22413	0.05067	-0.01414	0.08305	0.21255
Trust big business	0.63274	0.1483	0.0282	0.0114	0.02975	-0.02978	-0.15938
Number of informal ties	0.02209	0.08536	0.08507	0.72292	-0.06295	-0.10976	-0.25929
Number group memberships	-0.05803	0.05801	-0.0743	0.58095	0.01718	0.04612	0.35326
Number of institutional ties	0.077	0.03352	-0.07395	0.77431	0.09219	0.02106	0.08074
Diversity values in local area ¹	0.17864	0.7893	0.0583	-0.03279	0.15571	0.03692	-0.14837
Educational Diversity	-0.02884	0.01009	-0.09217	0.03266	0.05398	0.78898	-0.0899
Linguistic diversity	-0.04252	-0.13917	-0.06401	0.02164	-0.04392	-0.09197	0.79872
Density of friendships	0.12057	0.04048	-0.12352	0.26342	0.42883	-0.43253	-0.10893

Notes: 1. This item is reverse coded, where 0 = high diversity and 10 = no diversity.

Source: *Families, Social Capital & Citizenship survey*, Australian Institute of Family Studies, 2001.

Table C.2.6. Factor Correlation Matrix for factor analysis using original informal, generalised and institutional social capital items

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Factor 1	1						
Factor 2	0.25226	1					
Factor 3	0.19688	0.15841	1				
Factor 4	0.06211	0.06275	-0.02078	1			
Factor 5	0.08889	0.1764	0.11538	0.04853	1		
Factor 6	-0.02607	0.01321	0.03944	-0.06018	-0.108	1	
Factor 7	0.03749	-0.03789	0.04935	0.05313	-0.06135	0.08524	1

Source: *Families, Social Capital & Citizenship survey, Australian Institute of Family Studies, 2001.*

Appendix D: Coding scheme, summary statistics and results of regression analyses for validity testing

Appendix D.1: Coding scheme and summary statistics

Table D.1.1. Coding scheme and summary statistics (percentages) for categorical variables		
	n	%
Sex		
Male	707	47
Female	799	53
	1506	100
Relationship status		
In a married relationship	852	57
In a defacto relationship	134	9
Other	518	34
	1504	100
<i>Divorced or separated</i>		
Divorced or separated	220	15
Not divorced or separated	1285	85
	1505	100
<i>Presence of children</i>		
At least one child in household	506	33
No children in household	1000	66
	1506	100
Geographical location		
Capital and other metro	1142	77
Rural and remote	348	23
	1490	100
Education		
Less than yr 12 qualifications	528	35
Yr 12 qualifications	283	19
Trade certificate or apprenticeship	423	28
Tertiary	270	18
	1504	100
Employment status		
In paid work (or on leave)	920	61
Unemployed (or work for the dole)	63	4
Retired	337	22
Not in the labour force	186	12
	1506	100
Home ownership		
Own or purchasing home	1107	74
Do not own and not purchasing home	396	26
	1506	100
Ethnicity		
Speak language other than English (at home or with family)	219	15
Do not speak language other than English	1287	85
	1506	100
Self reported health		
Excellent health	334	22
Good health	1084	72
Poor health	84	6
	1502	100
Voluntary work		
Did voluntary work in the past year	898	61
Did not do any voluntary work in past year	593	41
	1492	100
Political activism		
Politically active in the past year ³	1130	75
Was not politically active in the past year	376	25
	1506	100

Notes: 1. Data weighted by sex and education. 2. Sub-totals may not sum to N because of missing information. 3. Respondents were classified as having been politically active in the past year if they had done one or more of the following: participated in an election (beyond compulsory voting), taken part in a demonstration or march, signed a petition, contacted the media regarding a problem, contacted a government official regarding a problem, attended a public meeting, joined with people to resolve a local or neighbourhood problem, and taken steps to improve the environment (beyond household recycling).

Source: Families, Social Capital & Citizenship survey, Australian Institute of Family Studies, 2001.

	Median	Mean	SD	n
Age (years)	47	48	16	1502
% informal network made up of family	37	39	19	1483
% informal network within 30 minutes	50	49	21	1467
Tolerance of diversity	8	7	2	1489
Satisfaction with safety of area	7	6	2	1501
Knowledge of local area	7	6	3	1497
Index of socio-economic advantage of area	1015	1015	76	1491

Notes: 1. 11 point scale measuring agreement with the following statement: "Having people from many different ethnic and cultural backgrounds makes Australia a better place." 2. 11 point scale where 0=not at all satisfied and 10= completely satisfied. 3. 11 point scale asking respondents how well informed they are about local affairs. 4. SEIFA Index attached to postcode data.
Source: Families, Social Capital & Citizenship survey, Australian Institute of Family Studies, 2001.

Appendix D.2: Results from regression analyses for scales of social capital in separate network types

Variable	B	T
age	0.003	0.835
male	-0.304	-4.374***
married	-0.170	-1.796*
de facto	0.056	0.427
separated or divorced	-0.393	-3.435***
live with kid/s	-0.236	-2.732***
% network made up of family	-0.002	-1.242
% network within 30 minutes	0.001	0.453
less than yr12 qualifications	0.040	0.405
trade or apprenticeship qualified	0.144	1.447
tertiary qualified	-0.063	-0.564
in paid work	0.020	0.180
unemployed	-0.259	-1.325
retired	-0.009	-0.059
home owner	0.145	1.575
language other than English	-0.358	-3.692***
excellent health	0.146	1.808*
poor health	-0.377	-2.456***
voluntary work in past year	-0.161	-2.261**
politically active in past year	-0.104	-1.280
tolerance of ethnic diversity	0.052	3.407***
live in a rural or remote area	0.055	0.632
safety of neighbourhood	0.019	1.235
knowledge of local affairs	0.051	3.461***
level of advantage of area	0.000	0.936
(Constant)	7.533	13.636***

Notes: 1. Adjusted R Square=0.085, F= 6.11, p<.0001, n=1394. 2. T is calculated by dividing B by seB. 3. * indicates that the underlying coefficient is significant at the 10 per cent confidence level, ** indicates that underlying coefficient is significant at the 5 per cent confidence level, and *** indicates that the underlying coefficient is significant at the 1 per cent confidence level. 4. Excludes 8 multivariate outliers. Includes 4 cases which are univariate outliers on dependent variable (with z scores in excess of + or - 3.3).
Source: Families, Social Capital & Citizenship survey, Australian Institute of Family Studies, 2001.

Table D.2.2. Results of OLS Regression model showing variables which significantly predict the size or extensiveness of informal networks

<i>Variable</i>	B	T
age	-0.008	-2.950***
male	-0.028	-0.547
married	0.321	4.714***
de facto	0.265	2.812***
separated or divorced	-0.103	-1.250
live with kid/s	-0.102	-1.634
% network made up of family	-0.011	-7.819***
% network within 30 minutes	-0.010	-8.037***
less than yr12 qualifications	-0.068	-0.966
trade or apprenticeship qualified	0.061	0.853
tertiary qualified	-0.008	-0.097
in paid work	0.091	1.149
unemployed	-0.047	-0.333
retired	0.105	0.952
home owner	0.035	0.534
language other than English	-0.031	-0.438
excellent health	0.149	2.545***
poor health	-0.056	-0.500
voluntary work in past year	0.365	7.107***
politically active in past year	0.037	0.633
tolerance of ethnic diversity	-0.021	-1.903**
live in a rural or remote area	0.067	1.066
safety of neighbourhood	0.030	2.672***
knowledge of local affairs	0.024	2.237**
level of advantage of area	0.000	-0.438
(Constant)	0.680	1.703*

Notes: 1. Adjusted R Square=.157, F=11.42, p<.0001, n=1408. 2. T is calculated by dividing B by seB. 3. * indicates that the underlying coefficient is significant at the 10 per cent confidence level, ** indicates that underlying coefficient is significant at the 5 per cent confidence level, and *** indicates that the underlying coefficient is significant at the 1 per cent confidence level. 4. Excludes 6 multivariate outliers. Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Table D.2.3. Results of OLS Regression model showing variables which significantly predict the density of friendship networks

<i>Variable</i>	B	T
age	-0.011	-3.150***
male	0.045	0.658
married	0.070	0.755
de facto	0.158	1.223
separated or divorced	-0.206	-1.844*
live with kid/s	-0.100	-1.191
% network made up of family	-0.003	-1.470
% network within 30 minutes	0.005	3.012***
less than yr12 qualifications	0.087	0.917
trade or apprenticeship qualified	0.126	1.308
tertiary qualified	-0.010	-0.093
in paid work	-0.174	-1.632
unemployed	-0.327	-1.665*
retired	0.242	1.633
home owner	-0.015	-0.168
language other than English	0.113	1.206
excellent health	0.169	2.143**
poor health	-0.115	-0.751
voluntary work in past year	0.134	1.932**
politically active in past year	-0.026	-0.324
tolerance of ethnic diversity	-0.013	-0.838
live in a rural or remote area	0.024	0.284
safety of neighbourhood	0.003	0.226
knowledge of local affairs	-0.014	-0.946
level of advantage of area	0.000	0.275
(Constant)	3.527	6.563

Notes: 1. Adjusted R Square=.027, F=2.539, p<.0001, n=1382. 2. T is calculated by dividing B by seB. 3. * indicates that the underlying coefficient is significant at the 10 per cent confidence level, ** indicates that underlying coefficient is significant at the 5 per cent confidence level, and *** indicates that the underlying coefficient is significant at the 1 per cent confidence level. 4. No multivariate outliers. Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Table D.2.4 Multinomial logit estimates of the level of linguistic diversity of informal network

	Somewhat mixed		Very mixed	
	Coef.	z	Coef.	z
age ⁱ	-0.021	-2.09	-0.007	-0.68
male	0.020	0.1	0.014	0.07
married	1.374	4.96	-0.901	-3.64
de facto	1.358	3.8	-0.647	-1.84
separated or divorced	-0.215	-0.57	0.242	0.87
live with kid/s	0.082	0.4	-0.201	-0.87
% network made up of family ⁱ	-0.014	-2.5	-0.005	-0.81
% network within 30 minutes ⁱ	-0.013	-2.66	-0.014	-3.11
less than yr 12 qualifications	-0.289	-1.1	0.234	0.8
trade or apprenticeship qualified	-0.149	-0.54	0.335	1.12
tertiary qualified	-0.142	-0.59	0.419	1.47
in paid work	0.067	0.26	0.193	0.61
unemployed	0.502	1.09	0.395	0.74
retired	0.105	0.26	0.328	0.79
home owner	0.166	0.71	0.047	0.18
language other than English	0.239	0.78	2.300	9.7
excellent health	-0.095	-0.49	0.115	0.54
poor health	0.272	0.63	0.423	1.06
voluntary work in past year	-0.011	-0.05	0.253	1.26
politically active in past year	0.415	1.78	0.560	2.52
tolerance of ethnic diversity ⁱ	0.150	3.13	0.071	1.62
live in a rural or remote area	-0.219	-0.9	-0.382	-1.49
safety of neighbourhood ⁱ	-0.122	-2.59	-0.137	-3.51
knowledge of local affairs ⁱ	0.073	1.54	0.046	1.21
level of advantage of area ⁱ	0.001	0.86	0.000	-0.06
constant	-2.597	-1.8	-0.811	-0.53

Notes: 1. Comparison group = Not mixed (homogenous). 2. Pseudo R2= 0.1589, Prob > chi2=0.00, n=1406. 3. For variables with more than two categories, omitted categories are: yr 12 qualification, not in the labour force, good health.

Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Table D.2.5 Multinomial logit estimates of the level of educational diversity of informal network

	Somewhat mixed		Very mixed	
	Coef.	z	Coef.	z
age ⁱ	-0.023	-2.49	-0.009	-0.82
male	0.002	0.01	-0.144	-0.65
married	0.324	1.38	0.331	1.16
de facto	0.259	0.82	0.045	0.11
separated or divorced	0.021	0.07	-0.081	-0.22
live with kid/s	0.257	1.2	0.401	1.54
% network made up of family ⁱ	-0.003	-0.66	-0.005	-0.75
% network within 30 minutes ⁱ	0.003	0.74	0.007	1.39
less than yr 12 qualifications	-1.247	-4.6	0.095	0.28
trade or apprenticeship qualified	0.625	1.81	0.854	2.05
tertiary qualified	-1.503	-5.74	-1.072	-3.11
in paid work	0.310	1.15	0.663	2.04
unemployed	0.056	0.1	0.258	0.43
retired	0.461	1.15	0.337	0.72
home owner	0.076	0.32	-0.067	-0.23
language other than English	-0.415	-1.69	-0.674	-2.16
excellent health	-0.422	-2.18	-0.500	-2.04
poor health	-0.105	-0.26	0.199	0.41
voluntary work in past year	-0.142	-0.76	-0.056	-0.24
politically active in past year	0.105	0.49	0.130	0.51
tolerance of ethnic diversity ⁱ	-0.007	-0.17	0.052	0.97
live in a rural or remote area	-0.272	-1.2	-0.292	-1.07
safety of neighbourhood ⁱ	0.017	0.38	0.021	0.37
knowledge of local affairs ⁱ	-0.001	-0.02	-0.039	-0.7
level of advantage of area ⁱ	-0.001	-0.89	-0.001	-0.32
constant	3.538	2.57	0.086	0.05

Notes: 1. Comparison group = Not mixed (homogenous). 2. Pseudo R2= 0.0887, Prob > chi2=0.00, n=1385. 3. For variables with more than two categories, omitted categories are: yr 12 qualification, not in the labour force, good health.

Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Table D.2.6. Results of OLS Regression model showing variables which significantly predict generalised norms of trust and reciprocity

<i>Variable</i>	B	T
age	0.015	4.244***
male	-0.027	-0.410
married	-0.088	-0.978
de facto	-0.295	-2.366***
separated or divorced	-0.574	-5.306***
live with kid/s	-0.161	-1.970**
% network made up of family	0.000	-0.130
% network within 30 minutes	0.003	2.084**
less than yr12 qualifications	0.175	1.884*
trade or apprenticeship qualified	0.078	0.832
tertiary qualified	-0.102	-0.965
in paid work	-0.012	-0.119
unemployed	0.017	0.092
retired	-0.112	-0.777
home owner	0.252	2.885***
language other than English	-0.222	-2.429***
excellent health	0.167	2.163**
poor health	-0.192	-1.315
voluntary work in past year	-0.133	-1.970**
politically active in past year	-0.036	-0.465
tolerance of ethnic diversity	0.135	9.358***
live in a rural or remote area	0.259	3.151***
safety of neighbourhood	0.291	19.384***
knowledge of local affairs	0.091	6.417***
level of advantage of area	0.001	1.513
(Constant)	1.841	3.499***

Notes: 1. Adjusted R Square= .451, F=46.88, p<.0001, n=1403. 2. T is calculated by dividing B by seB. 3. * indicates that the underlying coefficient is significant at the 10 per cent confidence level, ** indicates that underlying coefficient is significant at the 5 per cent confidence level, and *** indicates that the underlying coefficient is significant at the 1 per cent confidence level. 4. Excludes x multivariate outliers. Eight univariate outliers on dependent variable ignored for purposes of analysis.

Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Table D.2.7. Results of OLS Regression model showing variables which significantly predict number of group memberships

<i>Variable</i>	B	T
age	-0.002	-0.184
male	-0.067	-0.413
married	0.118	0.535
de facto	0.319	1.038
separated or divorced	0.099	0.373
live with kid/s	0.221	1.091
% network made up of family	-0.016	-3.399***
% network within 30 minutes	-0.004	-1.013
less than yr12 qualifications	0.152	0.666
trade or apprenticeship qualified	0.270	1.160
tertiary qualified	1.058	4.078***
in paid work	-0.175	-0.684
unemployed	-0.205	-0.452
retired	-0.297	-0.838
home owner	0.437	2.025**
language other than English	0.294	1.299
excellent health	0.330	1.737*
poor health	-0.500	-1.395
voluntary work in past year	1.879	11.271***
politically active in past year	1.304	6.890***
tolerance of ethnic diversity	0.045	1.280
live in a rural or remote area	-0.067	-0.328
safety of neighbourhood	-0.023	-0.612
knowledge of local affairs	0.025	0.731
level of advantage of area	0.003	2.652***
(Constant)	-1.693	-1.311

Notes: 1. Adjusted R Square= 0.198, F=14.85, p<.0001, n=1405. 2. T is calculated by dividing B by seB. 3. * indicates that the underlying coefficient is significant at the 10 per cent confidence level, ** indicates that underlying coefficient is significant at the 5 per cent confidence level, and *** indicates that the underlying coefficient is significant at the 1 per cent confidence level. 4. Excludes 4 multivariate outliers.

Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Table D.2.8. Results of OLS Regression model showing variables which significantly predict diversity of values in neighbourhood or local area

<i>Variable</i>	B	T
age	-0.005	-0.947
male	0.087	0.780
married	-0.101	-0.659
de facto	0.414	1.978**
separated or divorced	0.182	1.003
live with kid/s	-0.029	-0.215
% network made up of family	-0.002	-0.731
% network within 30 minutes	-0.007	-2.542***
less than yr12 qualifications	-0.144	-0.931
trade or apprenticeship qualified	-0.028	-0.180
tertiary qualified	0.423	2.393***
in paid work	0.382	2.196**
unemployed	0.864	2.821***
retired	0.314	1.295
home owner	-0.431	-2.932***
language other than English	0.345	2.246**
excellent health	-0.013	-0.102
poor health	0.004	0.018
voluntary work in past year	0.328	2.908***
politically active in past year	0.020	0.153
tolerance of ethnic diversity	-0.045	-1.898**
live in a rural or remote area	-0.211	-1.543
safety of neighbourhood	-0.380	-14.975***
knowledge of local affairs	-0.120	-5.057***
level of advantage of area	-0.003	-4.596***
(Constant)	11.160	12.770***

Notes: 1. Adjusted R Square=.31109, F=24.53, p<.0001, n=1313. 2. T is calculated by dividing B by seB. 3. * indicates that the underlying coefficient is significant at the 10 per cent confidence level, ** indicates that underlying coefficient is significant at the 5 per cent confidence level, and *** indicates that the underlying coefficient is significant at the 1 per cent confidence level. 4. Excludes 5 multivariate outliers. Source: *Families, Social Capital & Citizenship survey*, Australian Institute of Family Studies, 2001.

Table D.2.9. Results of OLS Regression model showing variables which significantly predict institutional confidence

<i>Variable</i>	B	T
age	-0.007	-1.814*
male	-0.064	-0.818
married	-0.174	-1.640
de facto	-0.502	-3.392***
separated or divorced	-0.184	-1.438
live with kid/s	0.038	0.387
% network made up of family	0.002	1.071
% network within 30 minutes	0.000	-0.030
less than yr12 qualifications	-0.071	-0.642
trade or apprenticeship qualified	0.060	0.533
tertiary qualified	-0.005	-0.036
in paid work	-0.177	-1.434
unemployed	-0.138	-0.637
retired	0.137	0.799
home owner	0.096	0.921
language other than English	-0.033	-0.302
excellent health	-0.042	-0.456
poor health	-0.893	-5.184***
voluntary work in past year	-0.015	-0.182
politically active in past year	-0.238	-2.617***
tolerance of ethnic diversity	0.146	8.677***
live in a rural or remote area	-0.185	-1.898**
safety of neighbourhood	0.118	6.673***
knowledge of local affairs	0.112	6.719***
level of advantage of area	1.5E-05	0.029
(Constant)	3.295	5.305***

Notes: 1. Adjusted R Square=0.187, F=13.83, p<.0001, n=1399. 2. T is calculated by dividing B by seB. 3. * indicates that the underlying coefficient is significant at the 10 per cent confidence level, ** indicates that underlying coefficient is significant at the 5 per cent confidence level, and *** indicates that the underlying coefficient is significant at the 1 per cent confidence level. 4. Excludes 3 multivariate outliers. Source: *Families, Social Capital & Citizenship survey*, Australian Institute of Family Studies, 2001.

Table D.2.10. Results of OLS Regression model showing variables which significantly predict breadth of institutional ties

<i>Variable</i>	B	T
age	-0.008	-1.410
male	0.078	0.724
married	0.476	3.266***
de facto	0.150	0.743
separated or divorced	0.241	1.375
live with kid/s	-0.301	-2.262**
% network made up of family	-0.018	-5.882***
% network within 30 minutes	-0.006	-2.296**
less than yr12 qualifications	-0.349	-2.315**
trade or apprenticeship qualified	0.025	0.160
tertiary qualified	0.594	3.475***
in paid work	0.642	3.812***
unemployed	-0.441	-1.480
retired	-0.109	-0.464
home owner	0.036	0.253
language other than English	-0.207	-1.389
excellent health	0.215	1.715*
poor health	0.472	1.972**
voluntary work in past year	0.901	8.202***
politically active in past year	0.763	6.120***
tolerance of ethnic diversity	0.061	2.626***
live in a rural or remote area	0.216	1.613
safety of neighbourhood	-0.003	-0.107
knowledge of local affairs	0.085	3.707***
level of advantage of area	0.001	1.629
(Constant)	0.709	0.834

Notes: 1. R Square=.24733, Adjusted R Square=0.23368, Multiple R=0.49733, F=18.12118, p<.0001, n=1405. 2. T is calculated by dividing B by seB. 3. * indicates that the underlying coefficient is significant at the 10 per cent confidence level, ** indicates that underlying coefficient is significant at the 5 per cent confidence level, and *** indicates that the underlying coefficient is significant at the 1 per cent confidence level.

Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Appendix D.3: Results from regression analyses for overall social capital scales - across network dimensions

Table D.3.1. Results of OLS Regression model showing variables which significantly predict overall norms of trust and reciprocity

Variable	B	T
age	0.003	1.109
male	-0.122	-2.576***
married	-0.103	-1.595
defacto	-0.209	-2.329**
separated or divorced	-0.364	-4.672***
live with kid/s	-0.089	-1.510
% network made up of family	0.000	-0.142
% network within 30 minutes	0.002	1.348
less than yr12 qualifications	0.098	1.465
trade or apprenticeship qualified	0.125	1.850**
tertiary qualified	0.001	0.017
in paid work	-0.025	-0.343
unemployed	-0.076	-0.562
retired	0.073	0.706
home owner	0.157	2.508***
language other than English	-0.217	-3.297***
excellent health	0.097	1.752*
poor health	-0.391	-3.711***
voluntary work in past year	-0.088	-1.801*
politically active in past year	-0.127	-2.309**
tolerance of ethnic diversity	0.101	9.779***
live in a rural or remote area	0.052	0.882
safety of neighbourhood	0.133	12.380***
knowledge of local affairs	0.088	8.668***
level of advantage of area	0.000	1.010
(Constant)	4.291	11.356***

Notes: 1. Adjusted R Square=.353, F=30.88, p<.0001, n=1382. 2. T is calculated by dividing B by seB. 3. * indicates that the underlying coefficient is significant at the 10 per cent confidence level, ** indicates that underlying coefficient is significant at the 5 per cent confidence level, and *** indicates that the underlying coefficient is significant at the 1 per cent confidence level.

Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Table D.3.2. Results of OLS Regression model showing variables which significantly predict overall level of connectedness

Variable	B	T
age	-0.008	-2.042**
male	-0.006	-0.085
married	0.390	3.869***
defacto	0.360	2.573***
separated or divorced	-0.010	-0.082
live with kid/s	-0.062	-0.667
% network made up of family	-0.018	-8.367***
% network within 30 minutes	-0.010	-5.625***
less than yr12 qualifications	-0.145	-1.392
trade or apprenticeship qualified	0.070	0.666
tertiary qualified	0.396	3.346***
in paid work	0.222	1.904**
unemployed	-0.272	-1.319
retired	-0.051	-0.316
home owner	0.137	1.392
language other than English	0.044	0.428
excellent health	0.267	3.084***
poor health	-0.006	-0.035
voluntary work in past year	0.926	12.161***
politically active in past year	0.543	6.295***
tolerance of ethnic diversity	0.019	1.209
live in a rural or remote area	0.060	0.649
safety of neighbourhood	0.016	0.975
knowledge of local affairs	0.059	3.728***
level of advantage of area	0.001	1.957**
(Constant)	1.081	1.838*

Notes: 1. Adjusted R Square=.299, F=24.88, p<.0001, n=1402. 2. T is calculated by dividing B by seB. 3. * indicates that the underlying coefficient is significant at the 10 per cent confidence level, ** indicates that underlying coefficient is significant at the 5 per cent confidence level, and *** indicates that the underlying coefficient is significant at the 1 per cent confidence level.

Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.

Appendix D.4: Results from regression analysis for social capital typology

Table D.4.1. Multinomial logit estimates of social capital cluster group membership					
	hi connections	sk limited	sk low:excluded		
	Coef.	Coef.	Coef.	z	z
age	0.00001	-0.010	0.011	-0.89	0.65
male	0.190	0.361	0.146	1.74	0.48
married	0.695	0.394	0.473	1.38	1.18
defacto	0.494	0.849	0.606	2.36	1.15
separated or divorced	0.061	0.751	-0.042	2.35	-0.09
live with kid/s	-0.085	-0.301	-0.570	-1.24	-1.56
tertiary qualified	-0.029	-0.339	-0.147	-1.27	-0.3
less than yr 12 qualifications	-0.519	-0.232	0.195	-0.82	0.4
trade or apprenticeship qualified	0.083	-0.585	0.378	-2	0.79
retired	-0.392	-0.385	-0.931	-0.89	-1.32
in paid work	0.150	-0.061	0.291	-0.22	0.56
unemployed	-0.379	-0.900	0.651	-1.38	0.89
excellent health	0.511	0.096	-0.295	0.43	-0.83
poor health	0.080	0.824	0.669	1.8	1.25
language other than English	-0.449	-0.441	-0.136	-1.66	-0.34
home owner	-0.265	-0.690	-0.782	-2.76	-2.14
voluntary work in past year	0.843	0.163	-0.370	0.81	-1.13
politically active in past year	0.104	-0.282	-0.297	-1.3	-0.91
% network made up of family	-0.015	0.007	0.009	1.19	0.96
% network within 30 minutes	-0.019	0.008	-0.003	1.48	-0.4
tolerance of ethnic/cult diversity	-0.067	-0.173	-0.082	-3.74	-1.08
live in a rural or remote area	0.111	-0.371	-0.190	-1.3	-0.48
live in an outer metropolitan area	0.448	-0.322	0.263	-0.65	0.31
safety of neighbourhood	-0.047	-0.273	-0.241	-6.24	-3.21
knowledge of local affairs	-0.009	-0.124	-0.209	-3.07	-2.95
level of advantage of area	0.000	-0.001	-0.003	-0.61	-1.67
constant	0.510	4.105	4.331	2.41	1.97

Notes: 1. Comparison group =strong norms, civic connections. 2. Pseudo R2=0.1486, Prob > chi2=0.00, n=1249. 3. For variables with more than two categories, omitted categories are: less than yr 12 qualification, not in the labour force, good health, lives in a capital city.
Source: *Families, Social Capital & Citizenship* survey, Australian Institute of Family Studies, 2001.