



**Australian Government**

**Department of Families, Housing,  
Community Services and Indigenous Affairs**

---

Social Policy Research Paper No. 32

# **Contemporary Australian archetypes: different people, different needs**

HELEN L BERRY

PETER BUTTERWORTH

TANYA M CALDWELL

BRYAN RODGERS

FAMILY AND COMMUNITY HEALTH RESEARCH UNIT  
THE AUSTRALIAN NATIONAL UNIVERSITY

**Improving the lives of Australians**

© Commonwealth of Australia 2008

ISSN 1833-4369

ISBN 978-1-921130-55-7

This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced by any process without prior written permission from the Commonwealth available from the Commonwealth Copyright Administration, Attorney-General's Department. Requests and inquiries concerning reproduction and rights should be addressed to the Commonwealth Copyright Administration, Attorney-General's Department, Robert Garran Offices, National Circuit, Barton, ACT 2600 or posted at <http://www.ag.gov.au/cca>.

The opinions, comments and/or analysis expressed in this document are those of the authors and do not necessarily represent the views of the Minister for Families, Housing, Community Services and Indigenous Affairs or the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs, and cannot be taken in any way as expressions of Government policy.

The study uses the confidentialised unit record file from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA project was initiated and is funded by FaHCSIA and is managed by the Melbourne Institute of Applied Economic and Social Research (MIAESR). The findings and views reported in this paper are exclusively those of the authors and should not be attributed to the MIAESR.

### **Refereed publication**

Submissions to the department's *Social Policy Research Paper* series are subject to a blind peer review.

### **Acknowledgements**

The research reported in this paper was completed under FaHCSIA's Social Policy Research Services contract (2005–08) with the Family and Community Health Research Unit, The Australian National University. We are grateful to FaHCSIA for the opportunity to conduct this research.

### **Administrative Arrangements Orders changes**

In December 2007, Administrative Arrangements Orders were announced that created a new Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) to replace the former Department of Families, Community Services and Indigenous Affairs (FaCSIA). The former acronym (FaCSIA) has been used where appropriate to refer to activities of the previous department.

### **For more information**

Research Publications Unit

Research and Analysis Branch

Australian Government Department of Families, Housing, Community Services and Indigenous Affairs

Box 7788

Canberra Mail Centre ACT 2610

Phone: (02) 6244 5458

Fax: (02) 6244 6589

Email: [publications.research@facsia.gov.au](mailto:publications.research@facsia.gov.au)

# Contents

|   |           |
|---|-----------|
| <b>Executive summary</b>  | <b>v</b>  |
| <b>1. Introduction</b>  | <b>1</b>  |
| 1.1 Scientific objective  | 1         |
| 1.2 Policy relevance: policy for whom?  | 1         |
| 1.3 Project outcomes  | 3         |
| 1.4 Research questions and aims   | 3         |
| 1.5 Project approach  | 4         |
| <b>2. Data and methods</b>  | <b>7</b>  |
| 2.1 Introducing cluster analysis  | 7         |
| 2.2 Use of cluster analytic methods in social policy-applied research         | 7         |
| 2.3 Studies that have used cluster analysis                                   | 8         |
| 2.4 Statistical methods   | 10        |
| 2.5 Technical issues in cluster analysis                                      | 11        |
| 2.6 Software  | 13        |
| 2.7 Data source: HILDA Wave 1   | 13        |
| 2.8 Sample and sampling   | 14        |
| <b>3. Selection of key concepts</b>   | <b>17</b> |
| 3.1 Technical issues in selection of concepts                                 | 17        |
| 3.2 Sources of evidence for concept selection                                 | 19        |
| 3.3 Psychosocial concepts relevant to health and welfare outcomes             | 19        |
| 3.4 Summary of key concepts   | 28        |
| 3.5 Operationalising the concepts   | 28        |
| <b>4. Measures and measurement</b>  | <b>29</b> |
| 4.1 Age, sex, Indigenous status and ethnicity                                 | 30        |
| 4.2 Summary of selection of primary and secondary variables                   | 43        |
| <b>5. Major groupings of Australians</b>                                      | <b>45</b> |
| 5.1 Overview of results: a five-cluster solution                              | 45        |
| 5.2 Five major groupings of Australians: interpreting a five-cluster solution | 46        |
| 5.3 Interim summary   | 49        |
| 5.4 Five clusters in terms of secondary variables                             | 50        |
| 5.5 Preliminary conclusion  | 64        |
| <b>6. Contemporary Australian archetypes</b>                                  | <b>65</b> |
| 6.1 Contemporary Australian archetypes: a five-cluster solution               | 65        |
| 6.2 Evaluation of cluster analysis  | 75        |
| 6.3 Conclusion  | 76        |
| <b>7. Summary and review of findings</b>                                      | <b>77</b> |
| 7.1 Project summary and main findings   | 77        |
| 7.2 Limitations of the study  | 78        |
| 7.3 Implications for policy and practice                                      | 79        |
| 7.4 Future research   | 81        |
| 7.5 Conclusion  | 82        |
| <b>Endnotes</b>   | <b>83</b> |
| <b>References</b>   | <b>85</b> |

## List of tables

|  |     |
|--|-----|
| Table 1: Contemporary Australian archetypes—a summary of key characteristics   | vii |
| Table 2: Sex and age group of study sub-sample respondents   | 15  |
| Table 3: Primary and secondary variables, and evaluation of measures   | 31  |
| Table 4: Proportions of women and men for categorical variables for study sub-sample   | 36  |
| Table 5: Mean scores for continuous variables for whole study sub-sample   | 37  |
| Table 6: Agglomeration schedules and ratios of change for a cluster analysis of HILDA participants using Schwarz’s Bayesian Criterion and Akaike’s Information Criterion | 46  |
| Table 7: Distributions of primary variables by cluster   | 48  |
| Table 8: One-way analyses of variance showing main effects for continuous secondary variables  | 51  |
| Table 9: Summary of chi-squared models for secondary categorical variables for five major groupings of Australians   | 52  |
| Table 10: Mean scores and standard deviations for continuous secondary variables   | 53  |
| Table 11: Obtained compared with whole of sample expected values for secondary categorical variables   | 54  |
| Table 12: Contemporary Australian archetypes—a summary of key characteristics  | 73  |

## List of figures

|  |    |
|--|----|
| Figure 1: Contemporary Australian archetypes   | 65 |
| Figure 2: Proportion actively involved in community groups and mean scores for social support for contemporary Australian archetypes   | 66 |
| Figure 3: Mean equivalised disposable annual income and mean satisfaction with financial situation for contemporary Australian archetypes  | 67 |
| Figure 4: Mean scores for physical functioning and mental health for contemporary Australian archetypes  | 68 |
| Figure 5: Proportion always rushed and proportion with too much spare time for contemporary Australian archetypes  | 69 |
| Figure 6: Mean satisfaction with current relationship, relationship with most recent former partner, job, and financial situation comparing the Dissatisfied Working Age Singles with the sample grand mean  | 70 |
| Figure 7: Proportion of Marginalised Australians compared to sample grand mean usually paying credit card debts fully each month, reliant on income support for more than 30 per cent of their income, and renting rather than owning or buying their home | 71 |
| Figure 8: Proportion of Marginalised Australians compared to sample grand mean experiencing childhood adversity (parents divorced, father unemployed) and pseudomaturity (left home and school prematurely)  | 72 |

# Executive summary

One of the most demanding challenges in social policy is to achieve broad consensus about who will be the recipients of policy interventions, how any common interests will be defined, and what priority different groups will have relative to competing interests. This consensus, to the degree that consensus can be achieved, is the end result of a political process (Edwards 2004). Robust bureaucratic processes can, if successful, assist in making the political process more rational, objective and focused on achieving the best possible outcome for the greatest proportion of Australians. Yet even in the best circumstances, information about stakeholder groupings comes primarily from the stakeholders themselves, or from those who represent them. Their influence on the process is sensitive to their lobbying skills, resources, and social status (Lewis et al. 2006). With few means of operating outside this paradigm, groupings tend to default to being issues-based. A group with a particular interest is then compared to every one else without the interest, with myriad such groups compared bilaterally with each other.

To the extent that the policy-making process is informed by research, evidence is delivered in the form of information about discrete factors that might be relevant to specific issues. One concern about this is that such evidence can itself be sensitive to ideological perspectives and influence (Brownson et al. 2006). This report addresses another concern, about the capacity of research findings to help inform the identification of stakeholder groupings. To be able to do this, an analysis must attempt to describe how all relevant characteristics combine, and how they find expression in the lives of individuals. This study describes and evaluates a method for analysing a wide array of established and innovative policy-relevant factors in terms of groupings of all Australians. No characteristics or groupings of people are excluded a priori but, instead, all are incorporated into the same analysis. In doing this, the study offers a perspective on overarching stakeholder groupings that has considerable objectivity, a sound evidence base, a blending of a wide array of relevant factors, and is presented from a perspective that is inclusive of all Australians.

## Overview of study

This report presents the results of the first of a two-phase program of research being conducted from 2005 to 2007 investigating types of people living in Australian communities. This is the first Australian study to use cluster analytic techniques to explore how a wide variety of sociodemographic, psychosocial and health factors combine and find expression in the lives of Australians. The analysis has been based on a large, nationally representative dataset with a social policy focus. As a result, the findings are broadly applicable to all Australians, and are directly relevant for social policy purposes.

The construction of five contemporary Australian archetypes is a unique, pragmatic and intellectually sound way of making sense of the enormous heterogeneity of Australians. In this first phase of our program of research, we have tested the appropriateness of the use of a particular analytic technique—cluster analysis—to address an overarching scientific objective. The objective is to provide an innovative perspective on the question: from a social policy perspective, are there new ways of thinking about what kinds of Australians there are and what they need?

Psychosocial profiling methodologies (cluster analysis) were successfully piloted on an Australian community sample using data from the *Eurobodalla Study* (Berry, Rodgers & Dear 2007; Berry & Shipley 2007). The current project has applied these profiling techniques to Wave 1 of the Household, Income and Labour Dynamics in Australia (HILDA) data set. We have proposed that there are five ‘contemporary Australian archetypes’ identified in terms of sociodemographic, psychosocial and health characteristics. They are:

1. Connected Retirees
2. Financially Secure Working Couples
3. Time-pressured Couples with Children

4. Dissatisfied Working Age Singles

5. Marginalised Australians.

A summary of the characteristics of the archetypes appears in Table 1, with full profiles given in Section 6.

## Aims of the study

There were five aims for this project, and all have been fully met:

- ▶ To demonstrate that it is possible, in a statistically sound, meaningful and scientifically useful way, to locate members of the general population into groupings based on sociodemographic, psychosocial and health factors.
- ▶ To identify the characteristics that best describe each category and that best discriminate between groupings.
- ▶ To prepare profiles that synthesise findings about the characteristics of each category in terms of primary and secondary variables.
- ▶ To evaluate the usefulness of employing cluster analytic and associated techniques using large, nationally representative datasets.
- ▶ To demonstrate that profiling techniques can be deployed using large, nationally representative samples for directly social policy-applicable research.

The cluster solution fully met all scientific evaluation criteria (Sections 5 and 6). Its intuitive appeal and internal coherence are particularly strong indicators of its underlying validity. Further, the successful completion of the study has demonstrated the value of investing in experimental research. In addition, its findings have the potential to contribute to the difficult task of defining and understanding key stakeholder groupings accurately, sensitively and meaningfully.

## Implications for policy and practice

Research findings based on cluster analysis have direct policy and program applicability (Section 2). The common goal of this analytic approach, to generate profiles for the express purpose of improving the design and delivery of services and interventions (Adlaf & Zdanowicz 1999), is particularly relevant when service recipients have multiple needs or complicated characteristics (Beitchman et al. 2001). Such is commonly the case for recipients of social policy interventions. The archetypes presented in this study may assist in understanding and defining the targets of policy and interventions within the bigger picture of all Australians.

While this study focuses on social policy needs, the archetypes could have other applications too, for example, in terms of helping inform decisions about taxation reform, neighbourhood renewal, or health care. Of particular value, the insights that we have generated into prototypical groupings of Australians are independent of vested interests. They have been produced as a result of the use of an analytic approach that helps the data (and, as this is a nationally representative database, all Australians) to speak for themselves.

Table 1: Contemporary Australian archetypes — a summary of key characteristics

| Connected Retirees   | Financially Secure Working Age Couples  | Time-pressured Couples with Children  | Dissatisfied Working Age Singles   | Marginalised Australians   |
|--|---|---|--|--|
| All over 55 years, average age 70 years, 60% women   | Most aged 45–55, average age 45 years, evenly men & women   | All aged 26–55, average age 39 years, evenly men & women  | Aged 15–55, average age 33 years, slightly more men  | Most aged 26–55, average age 38 years, 70% women   |
| More than 80% retired  | More than 70% in full-time paid work  | Full-time paid work, or many part-time and/or home duties   | Majority full-time paid work   | Home duties, students, not in paid employment, disabilities  |
| Low equivalised income and high reliance on income support, but high home ownership, credit card usually repaid, low financial hardship, high financial satisfaction | Very high equivalised income, no income support, own or buying home, credit card usually repaid, no financial hardship, high financial & highest job satisfaction | Equivalised income slightly below average, minimal use of income support, buying home, credit card sometimes paid, little financial hardship, fair to good job and financial satisfaction | Equivalised income above average, little use of income support, renting home, credit card rarely paid, some financial hardship; levels of satisfaction — job fair, financial low | Extremely low equivalised income, job & financial satisfaction, majority income support (80% for > one-third income), renting, credit card rarely paid, extreme financial hardship |
| Very low educational attainment, left school at 15 years   | Very highly educated — more than one-quarter tertiary or higher degree  | Highly educated — two-thirds diploma or tertiary degree   | Either highly educated or secondary education only   | Extremely low education; half do not complete secondary education  |
| Early socioeconomic hardship (Great Depression, WWII), but few other childhood adversities; no elevated pseudomaturity   | No early socioeconomic hardship, other childhood adversity rates not elevated; no elevated pseudomaturity   | Low levels of early socioeconomic hardship, and of other childhood adversity; low rates of pseudomaturity   | Low levels of early socioeconomic hardship, very low rates of pseudomaturity   | Highest levels of early socioeconomic hardship, extreme rates of pseudomaturity  |
| Married 40+ years, often not for first time; extremely happily partnered; relationship with former partner very good; large minority are widows                      | All married (20+ years), often not for first time, or de facto (4+ years); very happily partnered; relationship with former partner fair                          | All married (13+ years), few ever divorced, or de facto (6+ years); happily partnered; relationship with former partner fair  | Three-quarters never married, so almost none ever divorced. Lowest current partner satisfaction, and low former partner satisfaction   | Half single parent families, nearly one-third couples with children; one-third separated or divorced. Very low current and lowest former partner satisfaction                      |
| No children (still at home)  | No children (still at home)   | All have children (approx. 2) under 15 at home; 40% have non-resident children  | Mostly no children under 15 at home, but 10% have children or non-resident children under 15 years   | 1–2 children under 15 at home and one-third have non-resident children under 15 years  |

Table 1: Contemporary Australian archetypes — a summary of key characteristics (continued)

| Connected Retirees   | Financially Secure Working Age Couples   | Time-pressured Couples with Children   | Dissatisfied Working Age Singles  | Marginalised Australians  |
|--|--|--|---|---|
| Poor physical health and average satisfaction with health                        | Excellent physical health and satisfaction with health                             | Excellent (the best) physical health & wellbeing; highest satisfaction with health | Excellent physical health and satisfaction with health  | Extremely poor physical health for their age and lowest satisfaction with health                                    |
| Average mental health and good wellbeing, high levels of life satisfaction       | Excellent mental health, excellent wellbeing & life satisfaction                   | Fair mental health & life satisfaction, very time-pressured                        | Fair mental health but low life satisfaction  | Extremely poor mental health, too much spare time, lowest life satisfaction   |
| Very low risk health behaviours (smoking, alcohol), good community participation | Very low risk health behaviours, good community participation, best social support | Very low risk health behaviours, average community participation                   | Likely to smoke, though also likely to have given up; low-risk alcohol consumption; highest contact with friends & family | Highly likely to smoke and highly <b>unlikely</b> to use alcohol; lowest levels of social participation — all types |
| <b>22%</b> (N=1,292)   | <b>20%</b> (N=1,228)   | <b>26%</b> (N=1,150)   | <b>19%</b> (N=1,153)  | <b>13%</b> (N=788)  |

## Focusing on need

Like most developed economies, Australia has a system of income support that focuses on entitlement. The system aims to ensure that recipients receive access to a level of support or service to which they are entitled, and not more or less, and includes controlling access to more complex and expensive interventions. In some cases, however, it might be appropriate to focus more on need than on entitlement. People with high and complex needs are unlikely to respond to minimal, single or lower-order interventions, but tend instead to require tailored packages of services. Delaying the delivery of such services, particularly if this involves stressful intervening steps, can lead to a worsening of a person's situation and thus to increased intractability in their issues (for a review, see Berry & Butterworth 2003; Butterworth & Berry 2004). The development of contemporary archetypes could help identify the **combinations** of characteristics that might indicate the need for simpler or more complex interventions. These could be useful in avoiding the opportunity cost and wasted expenditure involved in inappropriate service delivery and in raising awareness among service delivery officers.

## Types within types

The cluster solution presented in this report is very strong, as evident in the stark differences between types, and the similarity and coherence within types. At the same time, there is considerable heterogeneity within the archetypes because Australians do not fall neatly into five archetypes. For example, the large majority of Connected Retirees were couples. But one-quarter were widows, who were older, less physically well, less financially comfortable, and lonelier than other Connected Retirees. Policies and interventions designed for Connected Retirees could not be expected to suit widows, who have different experiences and consequently different needs. This heterogeneity does not represent a set of anomalies, or weaknesses, in the cluster analysis. Rather, it points to three opportunities: (i) insight into when it is valid and appropriate to consider a grouping to be homogeneous, and when it is more appropriate to seek to understand heterogeneity within a group; (ii) the value of interpreting the first-order cluster solution in terms of archetypes that provide a conceptual framework, rather than applying them to specific cases; and (iii) using apparent anomalies to indicate where and how to look more deeply into the data.

## Future research

The findings of this study have potentially far-reaching consequences and it would be informative to generate more detailed understanding of types using other samples. This could be done in a variety of ways, as described in Section 7, including repeating the analysis on other random sub-samples drawn from the same and other waves of the HILDA Survey, and conducting similar analyses using other appropriate datasets. The *Growing Up in Australia* study (the Longitudinal Study of Australian Children) and the *Footprints in Time* study (The Longitudinal Study of Indigenous Children) would be particularly appropriate and amenable to this kind of analysis.

The second phase of the present program of research will be an extension of the present study that will look systematically at some of the within-archetype heterogeneity, including the production of a set of sub-types of each archetype and a more detailed examination of social and economic participation. Three further extensions of this research could prove valuable, including an examination of (i) migration across archetypes in response to changing circumstances in adulthood; (ii) archetypes of children and their relationships to parental archetypes; and (iii) archetypal life course development from childhood.

## Conclusion

This study is the first large-scale Australian research to use cluster analytic techniques to explore how a wide variety of sociodemographic, psychosocial and health factors combine and find expression in the lives of Australians. The analysis has been based on a large, nationally representative dataset with a social policy focus. Because of this, the findings are broadly applicable to all Australians, and directly relevant for social policy

purposes. The construction of five contemporary Australian archetypes is a unique, pragmatic and intellectually sound way of making sense of the enormous heterogeneity of Australians. The study has demonstrated the value of investing in experimental research. In addition, its findings have considerable potential to contribute to the difficult task of defining and understanding key stakeholder groupings accurately, sensitively and validly.

# 1. Introduction

This study is the first of a two-phase program of research investigating types of people living in Australian communities. This first phase, conducted in 2005–06, has involved:

- ▶ testing the appropriateness of a particular analytic technique—cluster analysis—using a large, nationally representative dataset to address a social policy question
- ▶ reporting on five ‘contemporary Australian archetypes’ based on a first order cluster analysis of Wave 1 of the Household, Income and Labour Dynamics in Australia (HILDA) dataset, and describing the design and analytic procedures employed to generate the archetypes.

The second phase (being undertaken in 2006–07) explores ‘types within types’ by conducting second order cluster analyses of each of the contemporary Australian archetypes. The full set of variables used for the first phase of the program of research will be used in the second phase. In addition, to extend the analyses of each sub-type, the first phase variables will be supplemented by the use of a number of additional variables examining two vital facets of contemporary Australian life in greater depth: social and economic participation.

## 1.1 Scientific objective

This report presents the results of a research project aimed at describing the types of people living in Australian communities according to key sociodemographic, psychosocial and health status indicators. The overarching scientific objective for conducting this study has been to provide an innovative perspective on the question: ‘From a social policy perspective, are there new ways of thinking about what kinds of Australians there are and what they need?’

Public policy has been described as a process designed to achieve important goals in society, and has been defined as ‘what governments do, why they do it and what difference it makes’ (Edwards 2004). While most goals relate to an overall vision of what Australia could or should be like, at the level of policy and program development they usually pertain to a particular segment of the Australian population. For example, while educational aspirations apply to all Australians throughout their lives, education policy and programs have a heavy emphasis on children and young people.

An essential component of achieving success with any aspect of the policy development process, and certainly with its eventual outcomes, is defining whose goals are being addressed. In this research, we are interested in social policy, and our specific focus is on social policy relevant sociodemographic, psychosocial and health factors. We will be asking, **in terms of these social policy relevant factors**, whether it is possible to use specialised analytic methods to help understand who Australians are. The purpose of doing this is to provide evidence-based information that could provide a sophisticated response to the ‘policy for whom?’ question, and thus assist in refining the design and targeting of relevant policies.

## 1.2 Policy relevance: policy for whom?

Defining for whom a policy is intended is no easy task, and there are many competing interests and strongly held stakeholder group views that require effort and sophistication to balance (Miller 2005). The resolution of this balancing results essentially from the political process (Edwards 2004), and ‘good policy processes can tame, but only to a degree, the political process’ (Bridgman & Davis 2000, cited in Edwards 2004, p. 7).

Despite this perhaps somewhat pessimistic view, with careful management by both parties, academics can assist policy-makers in the process of making good policy (Brownson et al. 2006). One way in which they can do this is to think laterally and creatively about the requirements of the policy process and produce evidence that can inform decision-making. In terms of the social policy focus of the present study, one of the many challenges

of responding to the ‘policy for whom’ question is to find pragmatic, workable, and intellectually sound ways of accommodating the heterogeneity of characteristics, aspirations and needs of Australians. It is essential to be able to define key customer groupings accurately and meaningfully, and to identify correctly those factors most likely to be associated with the achievement of individual and national aspirations.

Even when key and quite specific groupings have been defined, members of these groupings can still demonstrate considerable heterogeneity, and tend not to respond optimally to off-the-shelf solutions. Instead, certainly in the social policy arena, tailor-made services and interventions are required (Berry & Butterworth 2003; Butterworth & Berry 2004). Policies that suit one group of people will not necessarily suit another, and differentiation is necessarily an accepted part of program development and service delivery.

For example, it might seem that teenage mothers share similar characteristics—and they do (for a review, see Miller, Benson & Galbraith 2001). Understanding these characteristics is helpful in designing services, evident in the success of interventions designed to reduce teenage childbearing in America. But this success has had a differential impact across white, African-American and Hispanic Americans (Brindis 2006), indicating that teenage mothers’ needs are sufficiently heterogeneous with respect to ethnic origin that they require non-generic policies and programs. Within the Australian social policy context, groupings of people that might share a common characteristic, such as reliance on income support, also vary markedly and require differentiated policies and programs between and within groups. Just a few examples of people who are reliant on income support illustrate the point: lone mothers, people with physical disabilities, people who are not in paid work, or who have retired, and people who are homeless. Continual and accurate updating of definitions and descriptions of groupings of people, and of their issues, needs and potential for responsiveness to policy, underpins the success of the ongoing process of tailoring policies and programs.

### **Creatively rethinking groupings of Australians**

In terms of welfare policy, Australian policy, like that of other developed economies, emphasises the dual goals of ensuring that the state provides (mainly financial) assistance to those who cannot fully support themselves, and does not assist those that can. To this end, careful inclusion and exclusion criteria are applied to the selection of persons deemed to qualify for assistance and to decisions about the kinds and amounts of support to which they are entitled. As the nature of the assistance provided is overwhelmingly financial, the criteria are heavily focused on assessing applicants’ current financial circumstances. Among the results of this process is the categorising of Australians, firstly as income support recipients or not and, secondly, for the former group, according to the kind of income support entitlement.

A significant outcome of categorising people according to eligibility for income support is that it necessarily places all those who qualify in one basket and those who do not in another. A flow-on effect of this is that considerable attention is paid to a minority of people that qualify for support, and much less to those that do not. With attention heavily focused on the former, the income support or related needs of a large majority of Australians are subject to less consideration. Yet the majority of people who do not currently qualify for income support contain a substantial minority of Australians who, for a variety of reasons to do with their life trajectories and particular circumstances, are at risk of requiring it, or who have previously required it and might again.

From the perspective of understanding and assisting, where appropriate, in meeting the financial needs of Australians, the use of inclusion and exclusion criteria, and the allocation of people to entitlement groupings, is a systematic and rational approach. Yet it fails to promote a refined analysis of groupings of **all** Australians in a way that would permit much, if any, understanding of why income support recipients are in need of support, and why other Australians are not. This, in turn, leads to a situation in which it is difficult to conceptualise what sorts of interventions might undermine the underlying need for income support, and thereby leverage interventions to respond to possible causes, as well as to symptoms, of the need. In terms of identifying and addressing underlying causal processes relating to the requirement for income support, a more comprehensive approach could offer more leverage and the potential for greater policy sophistication.

Separately from any consideration of income support and the implications of processes designed to allocate it, there needs to be consideration of other factors that may not be financial in themselves but that are directly or indirectly related to people's financial capabilities and potential. These factors need to be identified in order to formulate interventions that are likely to be effective in assisting those who qualify for income support (especially long-term support), and for targeting interventions to assist those at risk of requiring support. Our previous research, for example, indicates the significant role mental health and associated psychosocial factors play in individual trajectories with different levels of risk of ultimately requiring income support (for example, Berry forthcoming; Berry & Butterworth 2003; Berry et al. 2007; Butterworth 2003a; Butterworth 2003b; Butterworth 2004; Butterworth & Berry 2004; Butterworth, Crosier & Rodgers 2004).

In thinking about public policy, it makes sense to identify people at risk and to intervene early to reduce the likelihood that they will find themselves in a position in which they require and qualify for income support. Such early intervention is likely to have two important advantages because, at this stage, the problems being addressed will be less intransigent. The advantages are that interventions will be (i) cheaper and easier to design and deliver, and (ii) more likely to succeed. In terms of good research, it makes sense to investigate **all** Australians as part of describing underlying processes and causal pathways that might lead to the requirement for income support. It is only by investigating the bigger picture, and the specific characteristics of sub-groupings within the community in the context of the bigger picture, that pathways towards or away from desirable goals may be elucidated.

### 1.3 Project outcomes

There are effective statistical techniques for constructing typologies, the most common of which are cluster analytic, or profiling techniques. Typologies can lead to substantially greater accuracy in understanding the characteristics that are essential to and typical of groupings of people. Where these kinds of analytic techniques can be applied in an experimental research context, it is possible to test their potential for deployment in support of the ongoing process of refining customer focus and policy development.

The intention of this project is to provide an empirical analysis of social policy-relevant groupings of people living in Australian communities, and to highlight potential policy and program implications of the results of the analysis. This project presents:

- a typology of Australians in terms of their sociodemographic, psychosocial and health-related characteristics
- pen-portraits, or 'profiles' associated with each type, highlighting the typical and contrasting features of each type
- a statement of potential issues of relevance to the social policy context for each type.

Psychosocial profiling methodologies (cluster analytic techniques) have been piloted and found effective on an Australian community sample using data from the *Eurobodalla Study* (Berry & Rodgers 2003; Berry, Rodgers & Dear 2007; Berry & Shipley 2007). Based on this research, this project has applied these profiling techniques to the HILDA data set.

### 1.4 Research questions and aims

To address our overarching objective of providing an innovative perspective on who Australians are and whether there are new ways of thinking about what they need, we have formulated three research questions:

1. What are the major statistically discernable groupings of Australian community members in terms of their sociodemographic, psychosocial and health-related characteristics?
2. What are the key characteristics of each of these groupings and what are the features that differentiate them from other groupings?
3. What features of the analysis might be of relevance to policy development or program delivery within a social policy context?

## Project aims

We have five aims for our project. Our first four aims relate directly to the research questions, and the last is a meta-aim. The first aim corresponds to the first research question. It is to report on whether respondents within a large, nationally representative, social policy-oriented dataset can be grouped based on a set of policy-relevant factors, in a statistically sound, meaningful and scientifically useful way. A second aim is to identify the characteristics that best describe each category and that best discriminate between groupings. This aim responds to the second research question.

A third aim is to prepare profiles, or ‘pen-portraits’, to integrate findings about the characteristics of each category in terms of the primary and supplementary variables investigated with respect to the first two research questions. A fourth aim is to highlight findings from these analyses that might be of policy or program relevance. This aim responds to the last research question. Taken together, these first four aims respond to our overarching objective of providing an innovative perspective on who Australians are and whether there are new ways of thinking about what they need.

Our fifth and final aim, which is a meta-aim, relates to the experimental use of analytic techniques that might be suitable for deployment to support the refinement of program and service development within a social policy context. In terms of this project, the principal analytic method for the statistical construction of typologies is cluster analysis. Cluster analysis is often supplemented by a range of techniques designed to drill down into the content of the typologies, and we have done this in our study. These techniques include  $\chi^2$  analyses, analyses of variance, and descriptive techniques. Our fifth aim for this project is to evaluate the usefulness of employing cluster analytic and associated techniques using large, nationally representative datasets, with respect to our overarching objective. Part of this aim is to inform a judgement about whether to consider using these techniques in other existing or proposed studies, not just the HILDA Survey.

In sum, our aims for this project are to:

- report on whether respondents within a large, nationally representative, social policy-oriented dataset can be categorised using a set of policy-relevant factors
- identify the characteristics that best describe each category
- prepare profiles summarising the key characteristics of each category using primary and secondary variables
- highlight findings from the analyses that might be of policy or program relevance
- evaluate the usefulness of employing cluster analytic and associated techniques using large, nationally representative datasets.

## 1.5 Project approach

This project has been conducted in 10 main stages:

1. development of a project protocol
2. technical literature review
3. identification of key concepts for inclusion in the analysis
4. selection of optimal primary variables
5. selection of supplementary variables
6. trial of alternative cluster analytic solutions
7. selection of optimal solution

8. analysis of key features of and key differences between types generated in optimal solution
9. preparation of profile descriptions
10. preparation of report.

The development of the project protocol comprised (i) deciding on and providing a rationale for the 10 stages summarised above, and (ii) articulating the activities that would be involved in each stage.

The purpose of the technical literature review in stage 2 was to identify from among the many approaches to cluster analysing that which would best suit our research questions and data. As cluster analysis has not been widely used in social policy applied psychiatric epidemiology, this is an innovative approach that required careful planning. Cluster analysis is sensitive to the form and mix of variables used, and the results of the analysis can be misleading if inappropriate variables are selected, or included at an inappropriate stage in the analysis. The identification of key concepts for inclusion in the analysis, the selection of optimal primary variables, and the selection of supplementary variables have therefore been important stages in the research (stages 3 to 5).

The trial of alternative cluster analytic methods and solutions and the selection of an optimal solution were key procedures in the process of identifying accurate and meaningful groupings within a typology in stages 6 and 7. The final step in the analysis, stage 8, was to generate the information necessary to identify the defining and discriminating features of each type. This involved analysing the groupings generated by the cluster analysis in terms of the variables used in the cluster analysis itself and in terms of the supplementary variables we selected. This provided the raw material necessary to prepare pen-portraits, or profiles, of each type that constituted stage 9. These are short but dense descriptions of each type based on their defining features and supplementary characteristics. Stage 10, the final stage of the project, has been to prepare this report.

### **Presentation of findings**

This section has introduced the present study and is followed in Section 2 by a description of the methods and data used. Section 3 presents the rationale behind the concepts selected for use in the cluster analysis, and their operationalisation and measurement are discussed in Section 4. The results of the cluster analysis appear in Section 5, with profiles of contemporary Australian archetypes presented in Section 6. Conclusions and discussion follow in Section 7.



## 2. Data and methods

There are many approaches to the analysis of multifaceted psychosocial phenomena, and to exploring their constituent elements and the relationships among them. Most approaches focus on investigating patterns of relationships among concepts. These approaches are essential to understanding which concepts matter with respect to particular outcomes, and how these concepts are, or are not, related. Such analyses contribute to the development of a theoretical framework that can be used to explain individual or group outcomes and generate information about how the relationships among relevant concepts with respect to a multifaceted phenomenon affect the lives of individuals. This process of synthesising research findings in terms of the effects of multiple concepts can be approached from a different perspective that can show how they are integrated into the lives of individuals using alternative, complementary statistical techniques. These are methods of psychosocial profiling, the most common of which is a family of techniques called cluster analysis.

### 2.1 Introducing cluster analysis

Psychosocial profiling methodologies, or cluster analytic techniques, have been piloted and found effective on an Australian community sample using data from the *Eurobodalla Study* (Berry & Rodgers 2003; Berry, Rodgers & Dear 2007; Berry & Shipley 2007). Based on this research, the present project has employed cluster analysis to analyse data from the HILDA Survey. Cluster analysis refers to a family of exploratory statistical techniques used for analysing similarities and differences in a target population based on a predetermined set of characteristics. It is an appropriate analytic method for profiling in studies in which mental health is a focus (Adlaf & Zdanowicz 1999), such as this study. Cluster analytic techniques are appropriately deployed when:

- it is assumed that there are underlying classes or groupings of people within the target population, but
- it is not known (i) what these groupings are, or (ii) which characteristics drive inclusion within one category or exclusion from another.

Relevant characteristics to include in the analysis are mainly derived by synthesising a body of existing research within the area of study focus. Cluster analysis is usually used in tandem with a number of other techniques, such as descriptive techniques, multivariate analyses of variance, various kinds of regression analyses, and chi-squared analyses, to enhance the profiling. The approach to defining the relevant characteristics for this study, and information about cluster analytic techniques, are discussed in the following sections.

At a big picture level, understanding how characteristics are patterned within individuals, and identifying the types of people that are ‘out there’ in the community, is an essential contributor to understanding why certain outcomes eventuate for some people but not for others. In this way, it is a potentially invaluable input into the policy development process. For these reasons, we have found it useful to employ statistical methods that can classify respondents into types based on their patterns of behaviour according to a set of relevant factors. With an overarching aim of providing an innovative perspective on the question ‘From a social policy perspective, are there new ways of thinking about what kinds of Australians there are and what they need?’, the use of an exploratory technique designed to investigate underlying groupings of people was essential.

### 2.2 Use of cluster analytic methods in social policy-applied research

Generally speaking, there are three broad benefits of conducting a cluster analysis.

Firstly, classifying respondents into types may enrich understanding of how a set of relevant concepts finds expression in different kinds of people, which is of particular relevance to our overarching aim. This may be achieved because clustering techniques can simplify complex data, find patterns in multifaceted phenomena,

identify how types of people are similar and dissimilar, and assist in developing hypotheses about which factors or concepts might be causally related (Adlaf & Zdanowicz 1999). Even if the types are not 'real', and do not reflect actual groupings of people in a community, this is still an interesting and useful procedure in terms of developing new research hypotheses for classifying people according to key concepts. Indeed, respondent-centred studies using cluster analysis have been successfully employed in psychiatric nosology (Beitchman et al. 2001), or found to be directly relevant to it (Rubin & Panzano 2002). This report is intended, in part, to generate discussion about whether the same might be true for social policy-applied research.

Secondly, it is important to employ a variety of methods in analysing large and complex phenomena, such as the relationship between reliance on income support and psychosocial circumstances. This is because different analytic techniques are suited to different types of research questions, and using a variety of techniques means a range of questions can be addressed and findings evaluated. Findings from various approaches can then be synthesised to provide a more complete response to complex research questions and a more sophisticated and holistic interpretation of why different people might achieve different outcomes in life.

A third benefit of using profiling techniques that can group people into types builds on our second point—that it can help further the general aims of social policy-relevant research. These aims include shedding light on which people develop problematic psychosocial outcomes, and why. A useful additional motivation is to inform the development of preventative interventions or programs to address problems as they emerge. Using analytic techniques that present a holistic perspective on people, taking account of a wide array of relevant factors, can assist in understanding why some people develop, for example, mental health problems, and also help determine what might assist in preventing or treating their problems (Rubin & Panzano 2002). Some examples of how cluster analysis has been used to achieve comparable scientific goals are presented to illustrate this point.

## 2.3 Studies that have used cluster analysis

Cluster analysis is most commonly used in the biological sciences in which, based on the assumption that there are 'natural' groupings of living organisms, forming classification systems is a common research goal (Real, Pleguezuelos & Fahd 1997). While cluster analysis is not routinely used in psychiatric epidemiology and associated domains of research, there are research situations in which its use is established. As in the present project, these almost always pertain to situations in which it is desirable to divide a large heterogeneous set of people into smaller, more homogeneous sub-groups (Beitchman et al. 2001). Typical examples within the field of psychiatric epidemiology include categorising people with different levels and types of mental health experiences, such as clients of hospital psychiatric services (Song & Singer 2001), sub-types of community members with depression (Tylee 2001; Tylee et al. 1999), or women with contrasting mental health experiences (Eggleston et al. 2001). Sometimes, the carers of people with mental health problems are the focus of the research, such as mothers of children with challenging behaviours (McKay, Maclean & Bourgeois 2002).

### Using cluster analyses to enhance understanding of populations of interest

Occasionally, cluster analysis is used simply to show that there are groupings of people within a field of interest, such as distinct types of adolescents within a larger group of adolescents with behaviour problems (Chung & Elias 1996), or sub-groups among school-age students engaging in drink-driving (Stoduto & Adlaf 2001). In these examples, the 556 adolescents in the study by Chung and Elias could be distinguished from one another based on different levels and patterns of self-efficacy, participation in extra-curricular activities at school, and life events, while the students in the study by Stoduto and Adlaf could be broken down into three types. These types, 'marginals', 'heavy drinkers', and 'delinquents', differed in their levels of a range of relevant factors, such as conduct disordered behaviour, use of alcohol, how often they drove having used alcohol, how many motor vehicle accidents they had, and how experienced they were as drivers.

These studies described some of the subtle but systematic differences between sub-groups in a target population, showing that even within apparently homogeneous populations there can exist substantial, predictable differences among members. These differences can be described in terms of key descriptors that are

relevant to, in this case, types of problem behaviours in adolescents. The key descriptors are frequently potential levers for intervention, and cluster analysis can be used to provide insight into which of these is likely to be the most powerful. The implication of this is that, from the perspective of designing policies or interventions, different sub-groups within an apparently homogeneous target population would be likely to respond to different approaches. While these studies were not specifically designed with a view to implementing drink-driving prevention programs for teenagers, or addressing adolescent behaviour problems, there were practical implications of the findings.

### **Using cluster analyses to inform policy development or service delivery**

Given the obvious practical applicability of research findings based on cluster analysis, this analytic approach is more frequently used to generate typologies, or profiles, for the express purpose of improving the design and delivery of services and interventions (Adlaf & Zdanowicz 1999). This goal is particularly relevant when the service recipients have multiple needs or complicated characteristics (Beitchman et al. 2001), such as is commonly the case for targets of social policies and programs. Three studies are described below to illustrate how the findings from cluster analyses investigating the relationship between mental health problems and three different policy areas may be applied in practice. These include examples from psychiatric epidemiology focusing on the relationship between mental health and (i) the criminal justice system for young offenders, (ii) young people who are homeless, and (iii) client-centred service delivery.

#### *Profiles of young offenders*

In a study of 1,840 young people convicted of criminal offences in the American state of Washington, cluster analysis was used to explore their different mental health profiles with a view to better addressing problems and, ultimately, reducing recidivism (Stewart & Trupin 2003). The cluster analysis conducted for this study gave support to the authors' hypothesis that there would be three distinct sub-groups among the young offenders. These sub-groups were juveniles with high levels of mental health symptomatology, those with co-morbid mental health symptomatology and substance use problems, and those with low levels of mental health symptomatology.

One interesting conclusion of this study with respect to policy development and service delivery concerned the availability of transitional programs for offenders leaving the juvenile justice system. Transitional programs involved assistance in moving from the highly structured world in which the juveniles served their sentences to the much less structured world outside the institution. The programs, which typically included such assistance as vocational training, or reconnection with school, were successful in achieving rehabilitation goals. However, entry into the programs was selective. The study found that, overwhelmingly, juvenile offenders with low levels of mental health symptomatology were much more likely to meet the entry criteria for the transitional programs. While their need was not in doubt, and the programs were of benefit to them, the selection bias had implications for the other offenders. It meant that those with the greatest need—the most complex situations—and at greatest risk of recidivism (those with high levels of mental health symptomatology or co-morbidities), received the fewest services, and little or no support in moving from institutional supervision back into the community. They were thus at extremely elevated risk of re-offending. As a result of this research, arrangements for the support of juveniles with higher levels and complexity of mental health needs were able to be the subject of an evidence-informed review.

#### *Profiles of young homeless people*

In a Canadian study of homeless youth, cluster analysis was used to challenge a view that young homeless people could be considered a more or less homogeneous group (Adlaf & Zdanowicz 1999). In the study, the authors used cluster analysis to classify 211 young homeless people into eight distinct types based on their symptomatology on a range of mental health disorders—such as psychotic thoughts, substance misuse, and attempted suicide—and on a set of other relevant psychosocial factors determined from the literature and discussion with practitioners. These included factors such as family dysfunction, history of abuse, prostitution, and street 'entrenchment' (the degree to which the young person was embedded in street culture). The eight

types were named 'entrepreneurs', 'drifters', 'partiers', 'retreatists', 'fringers', 'transcenders', 'vulnerables', and 'sex workers'. Though the numbers of participants in some groups were small, the authors obtained meaningful differences between the clusters on the full range of mental health and other factors. These were important both in terms of refuting the hypothesis that street youths formed a largely homogeneous group and presenting more accurate and detailed information about these young people, leading to advice on appropriate service provision.

Of particular value, the findings of the study contributed to reviewing approaches to service development and delivery. For example, the 'fringers' were those who, relative to other street youths, had lower levels of clinical symptomatology and were less entrenched in street culture. These young people responded well to educational and vocational interventions. At the other extreme, 'vulnerables' had extreme mental health needs and almost all had attempted suicide. These young street-dwellers required substantial assistance with their mental health problems before any other interventions or services could be introduced.

### *Using profiling to inform client-centred service structures*

Finally, in a study of a large sample of people with severe mental health problems living in the American state of Ohio, cluster analysis was used to classify service recipients from seven different samples (numbers ranged from 346 to 744) into five 'core clusters' or 'prototypes' (Rubin & Panzano 2002). A broad array of characteristics, including mental health characteristics, together with a range of social and other relevant factors derived from the literature and from extensive consultative processes involving service recipients, carers, researchers and service delivery staff were used. Like the study of Canadian street youths, the cluster analysis of mental health service recipients in Ohio drew attention to the considerable heterogeneity among participants.

The prototypes included: (i) older people with severe psychiatric symptomatology in conjunction with severe physical health problems; (ii) people with psychiatric symptomatology together with substance use disorders; (iii) people with long histories of mental health disorders interwoven with a wide range of general social difficulties; (iv) people who appeared to cope well enough in the community but who were in denial about serious problems with anxiety and depression; and (v) people who actively managed their mental health problems, including using mental health services as and when they were needed. The five prototypes were used in a range of planning and management activities involving staff, carers and service recipients, and resulted in substantial administrative and policy revisions. For example, prototypes served as the basis for restructuring service delivery mechanisms for around 1,000 clients in one county in Ohio, including the introduction of specialised teams dedicated to just one or two types of service recipient.

Studies such as these indicate the usefulness of cluster analytic techniques in identifying the heterogeneity of people within seemingly homogeneous groups, such as young offenders, homeless youth and clients of mental health services, and in responding creatively and in a tailored way to their needs. In terms of members of Australian communities in general, and of income support recipients in particular, it may be that meaningful themes reflecting their heterogeneity can be accurately identified with respect to important psychosocial factors and concepts. The purpose of doing this is to provide greater insight into who Australians are and what kinds of policies and programs might enhance their life circumstances.

## **2.4 Statistical methods**

Cluster analysis is a generic name given to a set of techniques that analyse associations between respondents rather than between variables (Diekhoff 1992, pp. 360–75). Respondents are assigned to classes by creating a taxonomy based on carefully selected respondent characteristics, such as, in this case, a range of psychosocial variables. The result of such an analysis is that a set of profiles of different types of people can be developed, highlighting the characteristics that are shared within a type (type homogeneity, or prototypicality) as well as the ways in which types differ from one another (type heterogeneity). These profiles can be of interest in their own right and can also be used as categorical variables in other analyses (Stewart & Trupin 2003). That is, between-groups analyses may be carried out comparing the experiences of different types of people, and investigating their psychosocial profiles, needs, and possible preventative measures or treatments.

## Selecting variables for cluster analyses

The aim of a cluster analysis is to propose a set of groupings describing respondents in terms of their defining **features**. An important goal of such an analysis is to reveal how groupings differ from each other, as well as how they are similar (Adlaf & Zdanowicz 1999). It is thus important in conducting a cluster analysis to decide which variables would be relevant to the analysis from the perspective of discriminating between different types of respondents. Some variables might be interesting, but might not help distinguish groupings. These variables would not be included in a cluster analysis. Instead, they would be considered ‘supplementary variables’, to be analysed later using other techniques. Such additional techniques might include examining significant differences among distributions of categorical variables between clusters, or significantly different mean scores for continuous variables between clusters. Differences between clusters based on the distributions of variables not used in the cluster analysis are particularly informative in evaluating the validity of the cluster solution (Beitchman et al. 2001; Stewart & Trupin 2003).

## 2.5 Technical issues in cluster analysis

### Methods of calculating distances

Cluster analysis is based on proximities between elements. In this case, ‘proximities’ are the closeness of individual respondents’ scores on each primary variable (see Section 3). ‘Elements’ are respondents. Proximities can be calculated in various ways and, in practice, this often involves calculating distances as a means of inferring proximity. Distances are differences between respondents, taking simultaneous account of their scores on all variables. The simplest and most common ways of calculating proximities are Euclidean distances and squared Euclidean distances (lower distances imply greater proximity). Euclidean distances are defined as  $\text{distance}(x,y) = [\sum_i (x_i - y_i)^2]^{1/2}$ . Squared Euclidean distances are defined as  $\text{distance}(x,y) = \sum_i (x_i - y_i)^2$ . Thus Euclidean metrics, which are suitable for use with any approach to clustering (Lance & Williams 1967), take account not just of the relative proximity between scores but also of their absolute proximities. This is particularly useful in analysing ordered categorical or continuous data measured on equivalent scales.

However, Euclidean metrics cannot be used when categorical data are included in the analysis. In this case, log-likelihood distances have to be calculated. Log-likelihood distances place a probability distribution on each variable. That is, unlike for Euclidean metrics, probability estimates rather than actual distances are calculated. The distances between clusters are amplified because log-likelihood distances progressively weight elements (respondents) that are further apart. This makes distinctions between groupings starker, aiding interpretation, and is particularly useful in examining the effects of categorical data included in the analysis. Log-likelihood distances are also appropriate for use with interval data alone. Thus, though this is a less common method of calculating distances, it is appropriate when using interval data alone (such as age or income), and is essential when combining interval data and categorical data (such as sex or payment type), as is the case in this study. This introduces an additional but related issue, that is, whether to use raw data or standardised scores for these analyses.

### *Using standardised scores*

In cluster analyses based on Euclidean distances, raw data are usually used. However, sometimes the variances of scores on the primary variables differ substantially. When this happens, variables with larger variances contribute disproportionately to the distance calculations, giving them emphasis. This emphasis is not always unwarranted, because it may be appropriate for some variables to contribute disproportionately to the distance calculations. But if such an emphasis is unwarranted, or if it is necessary to avoid inadvertent emphasis, standardised scores may be used.

As we have seen, when categorical data are included in the analysis, it is necessary to calculate log-likelihood rather than Euclidean distances. These are always based on standardised scores. In this study, therefore, it was appropriate to base all analyses on standardised scores.

### Approaches to creating clusters

The most commonly used clustering technique, agglomerative clustering, begins with individual respondents and combines individuals according to the proximity of their scores on all the variables in the analysis into groups, or clusters, of two or more. These tiny clusters are progressively combined into bigger clusters by locating other clusters containing respondents with similar data. In practice, in a study like this with a large sample, there would be pre-existing 'clusters'—in the data set there would be a number of individuals with identical or similar data. The first iteration would therefore be likely to generate quite large groupings.

There are various ways of determining proximity between clusters. These are based on the centroids within each cluster, which can themselves be calculated in various ways. The centroid can be interpreted as a mean score in multi-dimensional space. Either whole clusters, or individual respondents, may be added to a cluster at any stage in the process. As they grow, the clusters become more heterogeneous until, finally, all cases are included in one large cluster.

'Divisive clustering', the opposite of agglomerative clustering, is less commonly used but follows the same principle. In this case, the starting point is one large cluster of all respondents, which is progressively divided into smaller groups. Since the purpose of clustering is to generate reasonably homogeneous sub-groups from a larger heterogeneous group, a decision has to be made about when to stop combining or dividing clusters.

### Evaluation criteria

Various criteria are used to generate this decision. A solution may be evaluated, based on the 'agglomeration schedule', in terms of its statistical acceptability. But, as with many exploratory or descriptive techniques, the three most important criteria are substantive criteria. They include meaningfulness, scientific usefulness, and parsimony. A meaningful solution is one that is interpretable and self-evidently reasonable, while a scientifically useful solution is one that makes sense theoretically, or in terms of what is known or hypothesised within the field of research. A parsimonious solution is one in which the fewest number of clusters are used to produce a meaningful, scientifically useful, and statistically acceptable solution. This combination of substantive and statistical criteria, with the substantive criteria emphasised, is essential to the sound evaluation of cluster solutions in psychiatric epidemiology (Beitchman et al. 2001).

The agglomeration schedule is a calibration of the distance between elements within each cluster as the agglomeration or division proceeds. This is useful information because, in agglomerative clustering, as clusters are progressively combined the average distance between elements grows slightly. When agglomeration reaches a point at which quite dissimilar elements are combined, the average distance between elements jumps sharply. At this stage, the agglomeration has progressed one step too far to represent the data adequately and the preceding number of clusters will be the smallest number of clusters to which the elements can be adequately reduced. The same process in reverse applies to divisive clustering. Division continues until it reaches a point at which quite similar elements have been divided. Two commonly used agglomeration schedules are Schwarz's Bayesian Criterion and Akaike's Information Criterion. Both have been used and the results compared (Sections 5 and 6).

Finally, a ratio of change from one step to the next in the clustering process may be calculated based on the agglomeration schedule. The ratio of change is the ratio of the start value of the criterion statistic to the criterion statistic at any particular point in the agglomeration or division process. It is often not obvious from the absolute values on the agglomeration schedule at which point agglomeration or division has progressed one step too far. The ratio of change from one step to the next makes this clearer, and this ratio has been reported.

### Methods of clustering

There are various methods of clustering, most suited to small samples or exclusively to interval or categorical data. The most sophisticated of these methods, two-step clustering, is a method in which it is possible to simultaneously analyse continuous and categorical data. Unlike most clustering methods, two-step clustering is suited to large data sets. It is the most suitable method of clustering for this study because the data include continuous and categorical variables and the dataset is large.

In the first step of a two-step clustering procedure, the pre-cluster stage, respondents are assigned to locations on a 'cluster feature tree'. These locations are determined according to respondents' distances from all other respondents based on a multinomial distribution placed simultaneously on all variables. In the second step, an algorithm (in this case, the Akaike Information Criterion or Schwarz's Bayesian Criterion) is used to determine the most appropriate number of clusters into which to group respondents based on where they are located in the tree. The researcher may specify the number of clusters that are required, or may select the number of clusters post hoc based on statistical and substantive evaluation criteria, such as those outlined above. In this study, the latter option has been pursued. Two-step clustering has the additional benefit of being robust to violations of the assumptions of normality of distribution and independence of variables, which the data do not fully meet: distributions of participants' scores on some variables are skewed.

## 2.6 Software

Analyses for this study were conducted using SPSS 12.0.1 for Windows (Statistical Package for Social Sciences, SPSS Inc.) and Stata version 9.1 (StataCorp, Texas, United States of America). SPSS Inc. designed the two-step clustering procedure to overcome the main problems of clustering, particularly the difficulty accommodating large datasets and the inability to analyse categorical and continuous variables simultaneously. Figures were drawn in AMOS 5 (James L Arbuckle, 1994 to 2003, SmallWaters Corp.) and Microsoft Excel.

## 2.7 Data source: HILDA Wave 1

Our aim in selecting a dataset for this project was to identify one that could (i) allow the results of our study to be generalised as far as is practicable to all Australian adults and (ii) had wide coverage of psychosocial and sociodemographic concepts. The sampling frame and large sample size of the HILDA dataset, and the wide range of directly relevant concepts included, made it ideal for this project. A particular strength of the dataset is that it was designed with a social policy focus. Its specific aims are to 'support research and policy analysis' in three areas: income dynamics, labour market dynamics, and family dynamics (Wooden, Freidin & Watson 2002, p. 339). The HILDA data have previously been employed in studies, including longitudinal analyses, examining relationships between some of the health, psychosocial, and sociodemographic factors that are the focus of the present study. We were also looking for a longitudinal dataset because we anticipated that our findings would be amenable to longitudinal follow-up studies. The HILDA Survey is a longitudinal study for which data are collected approximately annually, and the sample has been designed to have an 'indefinite life' (Wooden, Freidin & Watson 2002, p. 342). At the time of the research, four waves of data had been released for analysis. A total of 12 waves of data collection have been planned. In all, we were confident that the HILDA database would be suitable for the present research and for any follow-up research that could be anticipated at this stage.

### *Data collection in HILDA*

Each wave of data includes a large set of items that are common to every wave, plus a special focus topic that includes a smaller, supplementary set of items that differs with each wave. These are collected in four separate survey instruments:

- ▶ Household Form (basic information and contact details about the house and household)
- ▶ Household Questionnaire (more detailed information about the household)
- ▶ Person Questionnaire (extensive sociodemographic information about each member of the household aged 15 years and above)
- ▶ Self-Complete Questionnaire (detailed psychosocial information about each member of the household aged 15 years and above).

The last two of these, in particular, contain substantial amounts of information that are directly relevant to our project's overarching objectives and research questions.

### *Use of Wave 1 data*

We decided to use Wave 1 of the data because it is the most complete (there has been no attrition). The relevance of the findings from the analyses that we planned would not be sensitive to the date of data collection or require the use of the latest wave of data. Further, as the first wave in a multi-wave dataset, there is potential for longitudinal follow-up building on analyses conducted on Wave 1. Among the future studies that we anticipated were studies examining transition between types over time. As the HILDA dataset is based on a stratified sample, it would also permit, as appropriate, multilevel analysis of type cross-sectionally and over time.

Fortuitously, Wave 1 data for HILDA were collected in late 2001 to early 2002 (Wooden, Freidin & Watson 2002), over almost exactly the same time period as data were collected for the *Eurobodalla Study*. Like the HILDA data, the *Eurobodalla Study* data were collected with social policy applications in mind and were drawn from an Australian general population sample frame (in this case, a southern coastal region of New South Wales). These were the data on which the statistical techniques used in the present study were tested. We therefore expected that the profiling techniques we planned to use in this study would be appropriate for use with (i) the kinds of variables we expected to require, and (ii) general population survey data that had been collected from late 2001 to early 2002.

## **2.8 Sample and sampling**

Our target population for this study was all adult Australian permanent residents and citizens living in Australia. This is also broadly the target population for the HILDA survey, which constitutes a large, nationally representative general population sample. The HILDA sampling strategy contained certain exclusions, such as people who are not Australian residents or citizens. One of the exclusions is problematic for our purposes, which is the exclusion relating to 'people living in remote and sparsely populated' parts of Australia. Indigenous Australians are overrepresented in remote and sparsely populated parts of Australia, and are among the most important targets for social policy research and associated initiatives. Their systematic exclusion from the study is therefore a concern with respect to the generalisability of our findings to our target population. A flow-on difficulty is that while Indigenous Australians are included in the sample in the same proportion (1.8 per cent) to that found in the community (1.7 per cent) (Wooden, Freidin & Watson 2002), their data may not be fully representative of all Indigenous Australians.

Despite concerns about the potential validity of any findings in relation to the generalisability of findings in terms of Indigenous status, we included Indigenous status as a primary variable in our cluster analysis. To address any outstanding concerns, we recommend the consideration of exploratory research using cluster analytic techniques in more representative samples of Indigenous Australians, such as the *Footprints in Time* study (The Longitudinal Study of Indigenous Children) initiated by FaCSIA following the handing down of the 2003–04 Budget. It should be noted that no single dataset can include every variable that anyone could ever want included in an analysis, and no single study can address every research question. This study, like all studies, is intended to do no more than add to a body of knowledge that is relevant to the development of Australian social policy, and the HILDA dataset is eminently suitable for this purpose.

Wave 1 of data collection for the HILDA Survey achieved a response rate of 66 per cent (N=13,965 adults aged 15 years and over), which compares favourably to similar large, nationally representative panel surveys in other developed economies (Wooden, Freidin & Watson 2002). Among the participants, 13,158 (93 per cent) returned usable self-complete questionnaires. People from Sydney, and to some extent Melbourne and the Northern Territory, men, people aged 20 to 24 years and 65 or over, unpartnered people, people not in the labour force, and people who owned their own business were all somewhat underrepresented in the sample. People from the rest of New South Wales and the rest of Queensland, women, people aged 35 to 44 years, people in part-time paid work, and people working in family businesses were slightly overrepresented (Wooden, Freidin & Watson 2002).

### *Random sampling from Wave 1*

The HILDA dataset is based on a stratified sample with the household, defined as ‘a group of people who usually reside and eat together’ as its primary unit of analysis (Wooden, Freidin & Watson 2002). For this study, the unit of analysis is individual respondents, not households. To avoid household-level covariance confounding the analysis it was necessary to draw a random sample of one adult respondent per household. This procedure necessarily involved the selection of all respondents from single-person households, leading to an overrepresentation of this group in our study sample. To ensure our sub-sample approximated the characteristics of the full sample, we randomly excluded 40 per cent of respondents from single-person households. The distribution of respondents by sex and age group is presented in Table 2.

In the HILDA Survey, adults are defined as respondents aged 15 years or over. For the sake of consistency with HILDA, we have also defined adults as all respondents aged 15 years and over. Initial model testing revealed that a particular category of young people was distorting the results of analyses. These young people were aged in their teens, were still in full-time education, were not in paid employment, and were living as dependants within a parental household, corresponding to the younger members of the HILDA category termed ‘dependent students’ (aged 15 to 25 years, in full-time study, and not in full-time paid work).

**Table 2: Sex and age group of study sub-sample respondents**

| <b>Age group</b>        | <b>Female</b> | <b>Male</b>  | <b>Total</b> |
|-------------------------|---------------|--------------|--------------|
| Young adults (15–25)    | 382           | 313          | 695          |
| Adults (26–39)          | 1,069         | 828          | 1,897        |
| Mid-life adults (40–55) | 936           | 797          | 1,733        |
| Retiring adults (56–65) | 412           | 371          | 783          |
| Young old-age (66–79)   | 415           | 328          | 743          |
| Late old-age (80+)      | 111           | 67           | 178          |
| <b>Total</b>            | <b>3,325</b>  | <b>2,704</b> | <b>6,029</b> |

For the purpose of our analysis, these young people were considered not to be living as independent adults, and were excluded from our sub-sample. The final sample for the study included N=6,029 respondents aged 15 to 92 years ( $M=45.4$ ,  $Sx=17.0$ ), including 3,325 (55.2 per cent) women aged 15 to 92 years ( $M=45.5$ ,  $Sx=16.7$ ), and 2,704 (44.8 per cent) men aged 15 to 92 years ( $M=45.4$ ,  $Sx=17.3$ ).



## 3. Selection of key concepts

The selection of factors and concepts to be included in a cluster analysis is of the greatest importance to the validity of its findings. One reason for this is that, because cluster analysis is an exploratory technique, it does not involve the articulation of study hypotheses, or their subsequent dis/confirmation. This means there is no pre-determined analytic result that will indicate the acceptance or rejection of a particular cluster solution. Like all exploratory techniques, the selection of a good solution is ultimately a matter of scientific judgement, and this makes cluster analysis vulnerable to misuse or misinterpretation.

Another reason for the careful selection of concepts is that cluster analysis is sensitive to the variables that are included in the analysis. The inclusion or exclusion of a particular variable can even generate different cluster solutions, so it is vital to ensure that all relevant concepts are included and irrelevant concepts excluded. This sensitivity of cluster analysis is not, however, a problem in itself; cluster analysis is an exploratory technique, and not intended to generate the 'correct' answer to a research question. It is intended to assist in exploring a concept. But for an exploratory process to be valid, concepts for inclusion in the analysis (and the variables selected to tap those concepts) must be selected a priori based on sound scientific theory and evidence, and on transparent criteria. They must not be selected after the fact in an exercise in data-mining, or in accordance with some other ad hoc or opportunistic approach. This is particularly the case for the selection of primary variables for a cluster analysis as these are the defining variables.

### 3.1 Technical issues in selection of concepts

We have selected concepts for inclusion in our analysis based on transparent, scientifically sound and substantively appropriate criteria. Our purpose in this study was to investigate the possibility of classifying adults living in Australian communities into meaningful, scientifically useful, policy-relevant groupings based on key sociodemographic, psychosocial and health factors. Given the diversity of types of Australians and the multiplicity of factors that affect their lives, in practice there could be any number of candidate concepts. In order to accommodate the most important of these within a manageable and sensible set, we selected as primary concepts those that were:

- ▶ established key correlates of individual health and welfare outcomes, as demonstrated by the findings of published empirical research reports and associated scholarly reviews
- ▶ scientifically meaningful and useful with respect to our research questions and overarching goal
- ▶ potentially applicable to social policy evidence or decision support requirements
- ▶ amenable to modification (where relevant and possible)
- ▶ observable and quantifiable
- ▶ able to be measured objectively
- ▶ self-evidently sensible.

#### *Secondary concepts*

The inclusion of secondary factors or concepts in a cluster analysis is optional, and the variables used to tap them do not contribute to defining the clusters. Instead they are used for post-hoc analysis of the content of clusters in order to enhance their description (profiling). In other words, secondary variables do not help analyse whether there are latent classes of people within a population, but they add depth and richness to the description of any classes that are identified. It was appropriate to include secondary factors and concepts in this analysis, as there were important concepts that met most but not all of the criteria for inclusion as primary variables. In addition, we wanted to make the profiles we produced as rich and informative as possible. We

selected as secondary concepts those that met the criteria for primary concepts except that they were (i) not amenable to objective measurement; (ii) overlapped with primary concepts, risking overweighting some concepts; (iii) could be confounded with primary concepts; or (iv) had too much missing data.

### *Missing data*

In two-step cluster analysis, cases that have missing data on any variable included in the analysis are excluded from the entire analysis. Variables with large amounts of missing data thus greatly reduce the number of respondents included in the analysis, and were avoided. Levels of missing data were categorised as acceptable or unacceptable. Variables that had less than or equal to 5 per cent (N=301) missing data were categorised as having an acceptable level of missing data, while those with more than 5 per cent missing data were considered unacceptable. Variables and measures with unacceptable levels of missing data were automatically excluded from use as primary variables. For variables that were excluded as primary variables, levels of missing data ranged from N=375 to N=5,416, with only two values less than N=1,206 (20 per cent missing data).

Acceptable levels of missing data for variables included as primary variables ranged from N=0 to N=269, with only one value greater than N=60 (1 per cent missing data).

### *Mental and physical health as primary concepts*

One exception to our approach to assigning concepts as secondary variables if they had too much missing data was the inclusion of health as a primary concept. The substantive importance of including the concepts of mental and physical health is discussed in more detail below. In this section, we address the issue of their inclusion as primary variables. Mental and physical health are measured in the HILDA Survey using the SF-36 self-report instrument. This is not an objective form of measurement—it is subjective and reflects respondents' perceptions of their physical and mental health status as assessed by their responses to a standard set of questions. Further, the SF-36 is included in the self-report questionnaire (SCQ) section of the survey. A total of 93 per cent of respondents provided usable data in the SCQ Wave 1 (see Section 2 for details, and Wooden et al. 2002). With the response rate being lower than it is for the interview-based sections of the survey, there are missing data on the SF-36 for 7 per cent of respondents.

The use of the SF-36 and its inclusion in the SCQ violate our criteria of objective measurement and of having an acceptable level of missing data. However, the SF-36 is a validated, widely used measure that is strongly correlated with clinically diagnosed health status (Ware et al. 1993). Further, the response rate for the SCQ as a proportion of the overall sample was very high, and the amount of missing data does not substantially violate our criterion of 5 per cent. It is our view that (i) the use of the SF-36, and its inclusion in the SCQ, did not result in serious violations of our criteria, and (ii) that physical and mental health are so important in understanding individual lives and overall outcomes that it was essential to include them as primary variables in our analysis. On this basis, we accepted the violations of our criteria associated with the use of the SF-36 and selected physical and mental health as primary variables, pending testing their statistical significance.

### **Age, sex and ethnicity**

We included as primary variables in our analysis the sex and age group of each respondent. We assigned respondents to six adult age groups: very young adults (15 to 25 years); young adults (26 to 39 years); mid-life adults (40 to 55 years); retiring adults (56 to 65 years); adults in young old age (66 to 79 years); and adults in late old age (80+ years).

To enhance the description of the profiles we generated, we included as secondary variables (i) age in years and (ii) age groups based on generational membership. Consistent with the *Eurobodalla Study* on which this analysis was piloted, generations included the Net Generation (15 to 25 years), Generation X (26 to 44 years), Baby Boomers (45 to 59 years), the Long Civic Generation (60 to 79 years) and the Elders (80+ years).

### *Indigenous status and ethnicity as primary concepts*

There were large amounts of missing data in relation to Indigenous status (24.7 per cent, N=1,492), and other difficulties relating to Indigenous status in the sampling strategy employed in HILDA (for details, see Section 4). For these reasons we would not, according to our missing data criterion, include Indigenous status as a primary variable in our cluster analysis. However, despite the large amounts of missing data, at 1.8 per cent of the Wave 1 sample, and 1.9 per cent of our sub-sample, the proportion of respondents identifying themselves as Indigenous Australians was not significantly different from, and slightly exceeded, the Australian Bureau of Statistics population estimate of 1.7 per cent (Wooden, Freidin & Watson 2002). We considered it essential to include Indigenous status in our analysis, and our approach to solving the issue of missing data is explained in Section 4 of the report.

## 3.2 Sources of evidence for concept selection

Our selection of concepts for inclusion in the cluster analysis is drawn primarily from three main sources of evidence. The first is a wide-ranging review that we conducted recently for the department, *Intergenerational transmission of reliance on income support: psychosocial factors and their measurement* (the *Intergenerational Review*, Berry et al. 2007). The review presented evidence on the psychosocial factors and concepts that are most powerfully and proximally related to the intergenerational transmission of reliance on income support. Because these factors are so powerful they are robustly associated with the handing down of extreme disadvantage from generation to generation, and they are by definition of key importance in framing people's lives. The second source for selection of concepts for the cluster analysis is our work on the mental health of people who rely on income support and its correlates. This research has highlighted the importance of taking account of mental health factors in understanding reliance on welfare. The third source is the literature on long-term outcomes associated with parental divorce, which has been one of our long-running interests and the subject of several literature reviews (Pryor & Rodgers 2001; Rodgers 1996a; Rodgers & Pryor 1998).

In synthesising these sources, we have been guided in our selection of concepts by a long-standing tradition of life course perspectives on research into the epidemiology of health, particularly mental health. That is, people progress through developmental stages and important transitions throughout life. They do so with more or less ease, and these transitions substantially influence their outcomes at any point. For example, they may or may not form a couple, have children, retire from paid employment, or grow old. People's experiences and needs vary considerably throughout this process, with different factors being important at different times. People's early life experiences can also powerfully affect their outcomes throughout adult life. For example, in a 20-year follow-up of London children who were 10 years old in 1970, childhood behaviour problems predicted severely difficult life events in early adulthood, irrespective of factors such as adult behaviour, mental health, or continuing contact with family of origin (Champion, Goodall & Rutter 1995). A particular emphasis in the present study is the role of lifetime sociodemographic factors, notably the role of poverty and disadvantage, and this is reflected in our final selection of concepts and of variables as presented in this and the next section.

## 3.3 Psychosocial concepts relevant to health and welfare outcomes

To organise the information in a user-friendly manner, the following key concepts for our cluster analysis are presented in alphabetical order. Where certain concepts have been drawn initially from the *Intergenerational Review* (Berry et al. 2007) which focused on young people, we have broadened the present review to include factors and concepts relevant to outcomes for adults aged 15 years and over, and to exclude factors that are exclusively relevant to children or very young people (such as secondary school educational aspirations, school engagement, childhood personality development, and teenage peer groups).

A concluding point made in the *Intergenerational Review* was that, by using pathways models, it is possible to advance beyond the individual consideration of each factor, and to identify how a range of concepts might be

integrated in particular individuals' lives. Cluster analytic techniques offer a different, complementary way of attaining the same goal and can help interpret how a number of characteristics find expression in the lives of individuals at a particular point in time. Cluster models can, at their best, be used to paint a portrait of what different kinds of people are like based on all the factors considered together.

Like pathways models, they accommodate a number of pertinent themes. Of significance among these from a social policy perspective are (i) the high degree of interrelatedness found among key psychosocial concepts, and (ii) the range, diversity, and intensity of disadvantages that coalesce in the lives of a minority of people.

The 10 concepts listed below are those that we consider to be the most powerful, proximal drivers of individual adult outcomes at any point in people's lives. They are:

1. adult relationships, including responsibility for parenting, victimisation and violence, and separation and divorce
2. aspirations, values, attitudes
3. economic participation (including welfare participation and employment), education, and financial circumstances
4. emotional intelligence and optimism
5. mental health
6. physical health
7. pseudomaturity and childhood adversities
8. social participation
9. substance use (commonly used legal and illegal substances)
10. temperament and personality.

### **Adult relationships**

Close relationships are among the most important and defining life experiences of most adults. There appears little doubt that close relationships confer considerable protection in terms of health and welfare, and this is particularly true of relationships such as marriage (Lewis et al. 2006). The health-influencing effects of marriage partly apply because of the relationship's association with health-related behaviours. For example, for better and for worse, there is considerable reciprocal spousal influence on behaviours such as smoking (Homish & Leonard 2005; Nystedt 2006). When relationships falter, these health-related effects are expressed in the negative. The dissatisfaction and unhappiness present in relationships and marriages that are not functioning well are themselves also a cause of significant distress and ill health (Eggleston et al. 2001).

The effects of relationship problems and their consequences are especially evident in vulnerable groups, such as unpartnered mothers, who experience greatly elevated exclusion and loneliness compared with partnered mothers (Targosz et al. 2003) and associated mental and other health problems (Butterworth, Crosier & Rodgers 2004).

Three aspects of adult relationships are of particular importance in influencing adult wellbeing: the presence of responsibility for parenting, living with victimisation and violence, and experiencing separation and divorce.

### *Responsibility for parenting*

The presence of children in a relationship has an important effect on relationship stability (for a recent review see Butterworth et al. 2006b). Consideration of parenting responsibility is therefore an important part of understanding what predisposes Australians to membership of particular groupings within the community in terms of sociodemographic and psychosocial factors. What happens to family composition when parents separate is a particularly sensitive consideration. For parents whose children do not live with them all the

time, the amount of time the children are in their care varies from family to family. This is a widely recognised situation, and the Child Support Agency categorises the degree of responsibility that parents take for caring for their children following separation in terms of how many nights a year the child spends with the parent. These groupings are 'sole' care (256+ nights), 'major' care (220 to 255 nights), 'shared' care (146 to 219 nights), 'substantial' care (110 to 145 nights), and 'less' care (fewer than 110 nights).

The HILDA Wave 1 database contains information on the number of nights per year children spend with their non-resident parents and, as would be expected, parents in our sample had diverse levels of responsibility for parenting their own (biological or adopted) children. Among those that were not responsible for the sole or major care of their children, 30 participants (4.8 per cent) were involved in shared care, six (<1 per cent) were involved in substantial care, and 583 (94.2 per cent) were involved in less than substantial care. In a large minority of cases (N=273, 44.1 per cent), children did not spend any nights at all with their non-resident parents.

### *Victimisation and violence*

Violence within adult relationships is common, especially violence against women (Purvin 2003; Romito, Crisma & Saurel-Cubizolles 2003; Romito, Mozan Turan & De Marchi 2005). In one American study, violence was estimated to take place in between one-third and one-half of marriages (Katz & Low 2004). It can take many forms, including violence against partners and against elders within the family (Tolan, Gorman-Smith & Henry 2006). Violence contributes substantially to relationship dissatisfaction (Levendosky & Graham-Bermann 2001), which can itself lead to health problems (Eggleston et al. 2001). Violence is also a risk factor for mental and physical health problems, and for health-risky behaviours, such as the use of substances (Romito, Mozan Turan & De Marchi 2005).

Living with violence is related to lifelong disadvantage and associated health risks. For example, those who grow up with violence are more likely to live in a violent relationship as an adult, either as a perpetrator or a recipient of violence (Stith et al. 2000). This may be because growing up with violence tends to predispose men to perpetrate and women to receive violence, and because women and men who grew up with violence tend to choose partners with the same childhood history (Pollak 2004). Women who experience violence are more likely than their non-victimised peers to be sole parents (Butterworth 2004).

### *Separation and divorce*

Separated and divorced people have higher rates of a wide range of mental health problems than other marital status groupings (Andrews et al. 1999; Robins et al. 1991). Some evidence shows that this is partly due to high rates of divorce in people with severe mental illnesses (Merikangas 1984). However, there are also studies showing that psychological distress and substance use increase very substantially around the time of separation (Butterworth, Crosier & Rodgers 2004; Pryor & Rodgers 2001; Rodgers 1995). There is some recovery from this acute period of distress, but levels of distress and substance use remain significantly higher in divorced people compared to married people, and some differences persist following remarriage (Hope, Rodgers & Power 1999). Many factors are implicated in the acute and chronic responses to separation. For the former, there is some evidence that men react more strongly than women and this may be a reflection of the greater likelihood of women initiating divorce—and men being the 'left' partners (Rodgers 1995). For long-term wellbeing, there is evidence that financial hardship and other adversities (including experience of violence) contribute to the high distress and disorder seen in lone mothers (Butterworth 2003a; Butterworth 2003b; Butterworth 2004; Hope, Power & Rodgers 1999) and some indication that remarriage may be more beneficial for men than for women (Power, Rodgers & Hope 1999).

### **Aspirations, values and attitudes**

Aspirations, values and attitudes are at times construed as equivalent concepts, and thus are often poorly differentiated, or are treated as interchangeable with each other and with other related concepts. Values, attitudes, traits, norms and needs are particularly commonly confounded (Hitlin & Piliavin 2004). Values are durable, overarching, hierarchically organised belief systems (Hitlin & Piliavin 2004) about what society 'should'

be like (social values) and about how people 'should' behave (personal values). Values are about ideals, and the idea of 'should' is central to the concept. A set of 10 core values appears to be common to all cultures, though their order of importance varies somewhat from culture to culture (Schwarz 1992). The 10 universal values are hedonism, power, achievement, stimulation, self-direction, universalism, benevolence, conformity, tradition, and security.

While values systems operate at a general level, attitudes are specific. People have attitudes towards a particular object, such as attitudes towards high achievers (Feather 1995). Although they are linked to values, attitudes do not necessarily incorporate the idea of 'should'. Aspirations can be seen as a particular set of attitudes that can be oriented within an understanding of values. Aspirations do not depend on a particular values orientation but are consistent with any formulation of values (Berry et al. 2007). The consideration of aspirations, values and attitudes within the proposed cluster analysis is important because values shape individuals' behavioural orientation, while beliefs and especially attitudes shape particular behaviours (Berry & Rickwood 2000).

### **Economic participation, financial circumstances and education**

Socioeconomic adversity is a key driver of poor health and wellbeing and its effects can last throughout the life course. For example, childhood adversity has predicted chronicity in adult mental health problems in clinical and in general population samples of Australians (Brown et al. 1994) and in international samples (Rutter & Smith 1995). Economic participation, financial circumstances, especially hardship, and education are extremely well established predictors of adult outcomes across a wide range of sociodemographic and psychosocial characteristics. These are extensively documented in the literature and will not be reviewed again here (for a recent review of key factors with respect to welfare outcomes, see Berry et al. 2007). A complete description of the measures we have used in this study, and how we derived them, are presented in the next section.

### **Emotional intelligence and optimism**

Emotional intelligence can be defined as 'the ability to perceive, understand, and manage one's emotions' (Ciarrochi, Chan & Bajgar 2001, p. 1105). Research into emotional intelligence is not yet mature and further work is needed to discriminate between the core features of emotional intelligence and its key psychosocial correlates (Berry et al. 2007). However, consistent and plausible findings are emerging. Those with high levels of emotional intelligence display characteristics such as self-motivation, persistence, impulse control, patience, empathy, optimism and the ability to manage their own moods and distress (Elias & Weissberg 2000).

Emotional intelligence is associated with a range of personal characteristics. These include empathy, general intelligence, defensiveness, personality (Mayer & Geher 1996), including openness (Austin et al. 2004), social support, mood management (Ciarrochi, Chan & Bajgar 2001), stress, mental health (Ciarrochi, Deane & Anderson 2002), depression, somatising, affect (Austin et al. 2004; Dawda & Hart 2000), optimism, impulse control (Austin et al. 2004) and life satisfaction (Gannon & Ranzijn 2005).

Optimism is a key facet of emotional intelligence and is strongly related to life success in general and (negatively) to common mental health problems such as depression, which inhibit success in life. While the literature on optimism is far too large to cover here, it is worth mentioning that 'dispositional' optimism<sup>1</sup> (Scheier, Carver & Bridges 1994) in particular is linked to long-term positive outcomes (Seginer 2000), including in health and wellbeing throughout the life course and across a wide range of situations and experiences. For example, high levels of dispositional optimism in men with HIV have predicted healthier immune status over time compared that of other HIV-infected men who are less optimistic (Tomakowsky et al. 2001). And older people with dispositional optimism have tended towards greater positive affect over time when faced with negative life events than their less optimistic peers (Isaacowitz & Seligman 2002).

### **Mental health**

Mental health is a key focus of our research. Its importance in influencing people's quality of life and general circumstances cannot be overestimated. The World Health Organisation has defined mental health as 'a state

of well-being in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community' (World Health Organization 2003, p. 7). A particularly elegant Australian definition of mental health is that it describes people's ability to '... think and learn, ... and live with their own emotions and the reactions of others' (Herrman 2001, p. 710). The prevalence of good mental health appears to be diminishing as the prevalence of common mental health problems, such as anxiety and depression, continues its steady increase (Twenge 2000) with no sign of abating (Sartorius 2001).

Currently around one in five Australian adults meets the diagnostic criteria for a mental disorder each year (Andrews et al. 1999), and many more exhibit sub-clinical levels of symptomatology (Butterworth & Berry 2004). Mental health problems have become the leading cause of non-fatal disease burden in Australia and account for nearly one-third of years lost to disability (Mathers, Vos & Stevenson 1999). The subjective experience of disability associated with mental health problems, and the accompanying levels of suffering, can be profoundly distressing (Rodgers, Smyth & Robinson 2004). Western European research has proposed that the severity of the impact of mental disorders can be as extreme as some of the most disabling physical disorders. Out of 15 major illnesses, severe depression ranked third only to quadriplegia and being in the final year of a terminal illness in the severity of its impact and intensity of associated suffering (Schwarzinger et al. 2003). In terms of a practical example of the impact of mental disorders in Australia, in 2001 around 2 per cent of deaths and 11 per cent of years of life lost resulted from suicide, and seven Australians end their own lives each day (Australian Bureau of Statistics 2003).

Mental health problems also place an enormous burden, financially and emotionally, on those who care for those experiencing the problems (Droes et al. 2004; Highet et al. 2004), and on others close to them. Children growing up in families in which a parent experiences mental health problems are at significantly higher risk than other children of developing their own mental health problems, or of displaying disordered behaviour (Baydar, Reid & Webster-Stratton 2003; Hinshaw 2004; Kilic, Ozguven & Sayil 2003). Further, research indicates that the steady increase of mental health problems is not confined to adults. The prevalence of mental health problems is also increasing among children in Australia (Langsford et al. 2001), as it is in America (Browne et al. 2004). As a result, like other developed economies, Australia can expect a continuation of the growth of the burden of disease associated with mental disorders.

Despite the prevalence, severity, costs, and population health prognosis of mental health problems, mental health is often at best considered (i) marginal as a health issue (Hickie 2002), and (ii) less important than physical health (Thornton & Tuck 2000). Nowhere is this position less justified than with respect to the health, welfare and overall life outcomes of those who rely for their livelihood on income support.

### *Mental health and income support*

There has been extensive research on the relationship of social position and economic status with mental health, including considerable Australian research, examining the relationship between unemployment and various psychological and mental health constructs (see reviews by Dooley, Fielding & Levi 1996; Murphy & Athanassou 1999; and Australian examples such as Comino et al. 2003; Feather, 1997; Flatau, Galea & Petrides 2000; Mathers & Schofield 1998). Our recent research has extended this consideration to a range of welfare client segments in addition to those identified as unemployed. Elevated levels of mental health problems are anticipated amongst welfare recipients for a number of reasons. For example, given the eligibility criteria, those who are entitled to, and have a need for income support payments, must demonstrate a lack of economic resources. Poverty or financial hardship is a risk factor for poor mental health (Feather 1997; Fryer 1999; Hope, Power & Rodgers 2001). Further, many welfare recipients have experienced traumatic or adverse life circumstances, and often these factors are directly associated with their eligibility or need for income support (for example, unemployment and redundancy, divorce and separation, death of spouse, disability). These adverse life events are also proven risk factors for poor mental health (for example, Turner, Wheaton & Lloyd 1995).

American research conducted in the context of welfare reform, primarily with single mothers, has shown an elevated prevalence of mental disorders amongst welfare recipients compared to the general population

(Coiro 2001; Danziger et al. 2000; Derr, Hill & Pavetti 2000; Kalil et al. 2001; Kalil, Schweingruber & Seefeldt 2001; Lennon, Blome & English 2001; Moore et al. 1995; Olson & Pavetti 1996). Between 35 and 60 per cent of welfare recipients experience a clinical disorder or substantial mental health symptoms. These findings have been replicated in other Western countries (Byrne et al. 1998; Kovess et al. 1999). The United States research also provides evidence that people with mental health problems have been less successful in their efforts to return to work than other welfare recipients (Danziger & Seefeldt 2002; Loprest & Zedlewski 1999; Moffit & Cherlin 2002). These findings have promoted policy responses such as the introduction of screening and identification processes, improving staff skills, and better referral between and integration of mental health and employment services (Derr, Douglas & Pavetti 2001; California Institute for Mental Health 2001).

The mental health of Australian income support recipients has been analysed using data from the National Survey of Mental Health and Wellbeing (Butterworth 2003a, 2003b). This analysis of working age respondents found elevated levels of mental disorders among welfare recipients. Around 34 per cent of income support recipients had experienced an anxiety, depressive or substance-use disorder in the previous 12 months, compared to 19 per cent of non-recipients. The prevalence of mental disorders was elevated in all client segments, and particularly pronounced in the lone mother group where around 45 per cent were identified with a mental disorder. The pattern of mental disorders differed across the different segments. The unemployed group demonstrated the highest levels of substance use disorders. The 'not in the labour force' group showed the greatest generalised psychological distress, but did not demonstrate levels of disorders as high as the group of unpartnered mothers.

This general finding was replicated and extended using data from the first wave of the HILDA Survey (Butterworth, Crosier & Rodgers 2004). Welfare recipients were significantly more likely to experience moderate or severe disability due to poor mental health than non-recipients, with rates particularly elevated among clients receiving disability, lone parent and unemployment payments. To a large extent, these elevated rates of mental disability were explained by reported financial hardship and demographic characteristics such as gender and partnered status, and physical disability. However, a significant proportion of mental disability remains unexplained in several client segments.

### Physical health

Physical health problems have huge consequences for people's functioning and quality of life generally (Schwarzinger et al. 2003), and directly and indirectly affect their social and economic participation (Berry & Butterworth 2003; Butterworth & Berry 2004). Around two-thirds of those who rely on income support because of disability or sickness have physical disabilities. For these reasons alone it is essential to take account of physical health in our present research.

In addition, physical health is closely connected to mental health (Herrman 2001) and, where physical health problems are prevalent, so too will be mental health problems. For example, a large minority of people in receipt of disability pensions for physical health conditions experience co-morbid psychiatric problems. The association between physical and mental health can be exploited to assist in addressing a key problem in survey-based mental health research, that is, underreporting of mental disorders (Kessler 2000).

There is pervasive, substantial and debilitating stigma associated with mental health problems (Barbieri 1998; Benzeval 1998; Burris 2006; Corrigan & Miller 2004; Derr, Hill & Pavetti 2000; Dijker & Koomen 2006; Gattuso, Fullager & Young 2005; Herrman 2001; Hickie 2002; Hinshaw 2004; Jamison 2006; Jayakody & Stauffer 2000; Johnsen et al. 1997; Kai & Crosland 2001; Keusch, Wilentz & Kleinman 2006; Laudet et al. 2002; Link & Phelan 2006; Major & Brien 2005; Michels et al. 2006; Mood 2006; Mueller et al. 2006; Murphy & Murphy 2006; Pajari, Jallinoja & Absetz 2006; Petterson & Friel 2001; Ritscher, Otilingam & Grajales 2003; Scambler 2006; Shaw, Lawlor & Najman 2006; Sweeney & Kisely 2003). For this reason, research participants are often less willing to disclose mental than physical disorders. Assessing physical health can attenuate to some extent the scientific consequences of underreporting of mental health problems by tapping **any** health problem. This provides greater accuracy and validity with respect to the assessment of the impact of health problems in our analyses.

## **Pseudomaturity and childhood adversities**

The concept of pseudomaturity relates less to a domain of behaviour and more to a person's age when a particular behaviour or a set of behaviours occurs. Its application has been in areas of adolescent behaviours and transitions from child to adult roles. The binding feature within this concept is that individuals are considered not to be sufficiently mature to deal adequately with circumstances in which they find themselves or which they choose for themselves. Because pseudomaturity is so frequently a response to childhood adversity, and because the combination is influential on development and adult outcomes, we are examining both concepts together in this study. Of particular interest are the links between parental separation or divorce and pseudomaturity.

### *Pseudomaturity*

In many areas of developmental psychology, early achievement is viewed as a positive outcome or sign of success. Examples include leaving home early, getting married or entering a de facto relationship by the age of 21 years<sup>2</sup>, and leaving school early. The concern, in this instance, is that some early transitions are linked to poorer developmental outcomes for the individual (Furstenberg, Levine & Brooks-Gunn 1990; Manlove 1998; Miller, Benson & Galbraith 2001) and are, thus, not viewed as a sign of success. That is, behaviours seen at an unusually young age are viewed as inappropriate in their own right or as having the potential to lead to adverse outcomes. Pseudomaturity as a concept used in psychiatry has been associated with a number of adverse outcomes in adulthood. In particular, it has been linked to substance use in adolescents (Newcomb 1996). In addition, pseudomaturity and childhood adversity are associated. For example, pseudomaturity has been linked to parental divorce (Kalter 1987)—children who have experienced parental separation are often said to appear older than their peers, and children whose parents have divorced exhibit other signs of pseudomaturity (see next section).

This is linked in turn to intergenerational cycles of disadvantage, in that parental separation or divorce is also predictive of the breakdown of individuals' own relationships and marriages (Amato 1996).

### *Childhood adversity: parental separation or divorce and children's long-term outcomes*

Empirical evidence from large scale surveys confirms that children from divorced families are more likely to leave school at an early age, leave the parental home at an early age, enter into sexual relationships when young, get married themselves when young, and have children when young (Pryor & Rodgers 2001; Rodgers & Pryor 1998).

A large body of research evidence across developed countries has demonstrated significant long-term disadvantages for children from divorced compared with intact families of origin, including differences found during adulthood (Amato & Keith 1991; Pryor & Rodgers 2001; Rodgers & Pryor 1998). These disadvantages range across family, social and psychological outcomes and poor outcomes are roughly 50 to 100 per cent more likely for those from divorced families. Although there has been considerable speculation as to whether there are gender differences in such outcomes or whether there are sensitive periods in regard to children's ages when their parents divorce, the evidence across a large number of studies does not demonstrate significant variation (Pryor & Rodgers 2001; Rodgers & Pryor 1998).

Considerable circumstantial evidence and some more direct investigations (Rodgers et al. 2006) indicate that many of the poor outcomes associated with parental separation cannot be attributed to family breakdown per se. Nevertheless, parental divorce or separation remains as a predictor of poorer adult outcomes and a useful marker of other types of childhood disadvantage that are typically unmeasured in studies of adults.

## **Social participation**

Social participation and connectedness are thought to be of fundamental importance to people's wellbeing and to their continued development and adjustment throughout life (for a review, see Berry, Rodgers & Dear 2007). This is especially the case for mental health and wellbeing that are a particular focus of the present research. Higher levels of community connectedness are associated with fewer mental health problems (Kawachi & Berkman 2001; Lee, Draper & Lee 2001; Skrabski, Kopp & Kawachi 2003; Twenge 2000; Wainer & Chesters 2000), including among older adults (Michael et al. 2001; Seeman & Berkman 1988), among adolescents (Bond et al. 2001; Hendry & Reid 2000; Resnick et al. 1997), within ethnic and immigrant groups (Hao & Johnson 2000;

Huriwai et al. 2000), among caregivers (Cannuscio et al. 2004), and in rural and remote locations (Wainer & Chesters 2000). Lack of social contact with friends is a precursor to depression (Nangle et al. 2003). It is also linked to difficulty recovering from depression (Prince et al. 1998) and with recurrence of depressive episodes (Riise & Lund 2001).

Community participation is protective against a wide range of negative outcomes and is, generally speaking, a desirable resource. But levels of participation are not evenly distributed across the population and not everyone has access to participation or its benefits. In Australia, as in many other countries, certain sub-groups of the population, such as certain ethnic (Lindstrom 2005), socioeconomically disadvantaged (Baum et al. 2000) and mentally ill groups (Madianos et al. 1987; Phelan et al. 2000; Rahav, Streuning & Andrews 1984; Smith 1981) report low levels of community participation and elevated levels of health and other problems (Baum et al. 2000). There may, in addition, be employment correlates and intergenerational effects of some aspects of early-life community participation. A study from the Longitudinal Surveys of Australian Youth (LSAY) found that high school students from high socioeconomic status, English-speaking backgrounds were more likely to volunteer than their less advantaged peers, and that patterns of early volunteering translated into a higher likelihood of volunteering during adulthood (Brown, Lipsig-Mumme & Zajdow 2003). Because of its links to disadvantage and exclusion, it is particularly important to include assessment of social or community connectedness in this study.

An important and related concept, and one for which there is a long-standing body of evidence, is that of social support. For Australians, social support has been defined as a combination of the network of known others available to help an individual when help is required, together with the quality of help the network actually delivers (Baum 1999). Importantly, what seems to matter to individuals are not the objective features of their network but that they **believe** other people will support them when they need help (Cohen et al. 1985). Some researchers have found that it is only support from a core person or intimate relationship that is important (Brown et al. 1986) and that the availability of at least one confidante is the most discriminating of the characteristics of social support (Eisemann 1984; O'Neil, Lancee & Freeman 1984). A number of factors can shape the nature and level of a person's social support. For example, depending on their personality, different people have different types and levels of social support (Emmons 1992), and this appears to hold true across cultures (Tong et al. 2004). Early life experiences can also affect adult social support, and positive early relationships with parents have been associated with higher levels of adult social support (Sarason & Sarason 1982).

### **Substance use**

The use of substances, and substance use disorders, are commonly recognised as being related to physical and mental health problems (Spooner & Hetherington 2004). Illicit drug use and disorders are linked to socioeconomic disadvantage, health, wellbeing, legal and welfare problems (Ministerial Council on Drug Strategy 2001). However, substantial burden and costs are also associated with legal drugs, namely alcohol and tobacco (Mathers, Vos & Stevenson 1999). In Australia, tobacco and alcohol are leading risk factors responsible for a large proportion of total disease burden (Mathers, Vos & Stevenson 1999). Alcohol and tobacco use are associated with increased dependence upon welfare (Casper et al. 2002), as well as physical health problems (San Jose et al. 2000).

There is now also general recognition that substance use and other mental health disorders tend to co-occur (Andrews, Issakidis & Slade 2001). In the Australian National Survey of Mental Health and Wellbeing (1997), 25 per cent of men and 46 per cent of women with a substance use disorder also had an affective or an anxiety disorder, and a substantial proportion of men (10 per cent) and women (18 per cent) with substance use disorders reported both anxiety and affective disorders (Andrews et al. 1999; Ciarrochi, Chan & Bajgar 2001). Compared with sole disorders, the co-occurrence of substance use and mental health disorders is associated with particularly poor outcomes, including increased disability (Andrews, Henderson & Hall 2001) and impairment, disruption of performance in daily activities, 'spells' of disability, attempted suicide and poorer physical health (Newman et al. 1998, p. 308). Furthermore, co-morbid substance use and other mental health disorders have been associated with more chronic (Danziger et al. 2000) and severe disorders (Kessler et al. 1994), completed suicide, and higher relapse rates (Croft 2002; Drake et al. 1993; Hall et al. 1998; Helzer & Pryzbeck 1988; McLelland et al. 1983).

It is important to note that the risk factors and outcomes associated with the use and abuse of drugs are not always consistent, they can depend upon whether diagnosis or levels of use are being investigated, and on the risk factor or problem being investigated (Spooner & Hetherington 2004). For instance, levels of use may not be equated with problematic or disordered use of drugs (Donovan & Jessor 1983; Spooner & Hetherington 2004; Stein, Newcomb & Bentler 1987; Stein, Newcomb & Bentler 1988). The consumption of drugs has been found to relate to, but not to be directly equivalent to problematic use (Stein, Newcomb & Bentler 1988). Additionally, the aetiology of relatively benign use of drugs may be different from that of problematic use (Stein, Newcomb & Bentler 1987, p. 1096).

While abstaining from the use of drugs is usually associated with better health and wellbeing, there is one notable exception. Research is accumulating that relative to moderate drinkers, non-drinkers and heavy drinkers both tend to report increased mental (Clausen & Jones 1998; Degenhardt, Hall & Lynskey 2001) and physical health problems (Corrao et al. 2004; Doll et al. 2005), and a small group of studies links abstinence with other disadvantaged socioeconomic and social circumstances (Camacho, Kaplan & Cohen 1987; Danziger et al. 2000; Winefield et al. 1992).

Explanations for the poor health and wellbeing outcomes of non-drinkers remain highly debated (Jackson 2005). Non-drinkers are recognised as a heterogeneous group, including past drinkers, past problem drinkers and lifetime abstainers (Wannamethee & Shaper 1997). Consequently, some studies have argued that past problem drinking can explain, or at least is partly involved in accounting for, the poor outcomes of current non-drinkers (Corrao et al. 2004), but evidence is accumulating that this is not a feasible explanation. For instance, a much greater proportion of past problem drinkers become moderate drinkers than non-drinkers (Caldwell et al. 2002). This is consistent with the notion that while some problem drinkers cease drinking altogether, a much larger proportion cut back their consumption of alcohol. Other studies have argued that social support and isolation are involved in the distress of non-drinkers (Danziger et al. 2000).

It remains unclear whether abstinence is a result of disadvantage, such as physical health problems and poverty, and/or whether non-drinking directly causes particular problems (such as cardiovascular disease). Both are possible. Regardless of the explanation for the poor outcomes of non-drinkers, alcohol research consistently identifies and reports on the health and wellbeing of non-drinkers, recognising that they may obscure findings if included with light to moderate drinkers in comparisons with heavy drinkers.

### **Temperament and personality**

Temperament is fundamental and unchangeable, biologically based, evident from babyhood, stable over the life course, and measurable (for a review, see the Intergenerational Review, Berry et al. 2007). It can be defined as an underlying orientation to life that systematically biases people's experiences and their reactions to events (Moore et al. 2005). Various categorisations of temperament have been proposed, most arguing that there are four or five underlying dimensions of temperament (Akiskal 2005; Cloninger 2000; Moore et al. 2005). Despite (and sometimes because of) their temperaments, people develop and change throughout their lifetime, and this takes place within a context of continual social change (Elder 1994).

At a more proximal level, temperament interacts with a person's immediate environment, and with the events and experiences a person encounters, to shape personality (Moore et al. 2005). Unlike temperament, personality evolves over the life course, though it is reasonably stably established in most people from early adulthood (Clausen & Jones 1998). There are various models of personality, each proposing different numbers of primary dimensions of personality, with considerable overlap and congruence between the models (Krabbendam & van Os 2005). The five-factor conceptualisation of personality (commonly known as 'the Big Five') is dominant in the literature (for a review, see Chamberlain 1990). The factors are extraversion, neuroticism, agreeableness, conscientiousness and openness to experience, and each contains a number of sub-factors. Neuroticism is properly reframed as 'emotional stability' (Asendorpf & van Aken 1999), a more illustrative and less pejorative term.

People are not blank sheets on which genes and experience make their mark, but actively shape their own lives. Temperament and personality are key drivers of the way in which individuals influence their own environment

and, thereby, their experiences and outcomes throughout life. For example, people with high levels of emotional instability attract negative life events. In a general population study of 892 Australians, people who reported symptoms of emotional instability were involved in more negative interpersonal interactions than high stability participants (Poulton & Andrews 1992). The authors concluded that low-stability people could not be considered merely 'passive reactors' to whom events happened, but were 'highly emotionally sensitive and overly responsive' (p. 37), inadvertently attracting interpersonal difficulties. Evidence from a British longitudinal study, the National Survey of Health and Development, concluded that adolescent personality made a contribution to predicting adult mental health experiences (Rodgers 1996b). Temperament and personality can also affect other factors within individuals' social environment, such as relationships with others and the quality of social networks. For example, depending on their personality, different people have different types and levels of social support (Emmons 1992), and this appears to apply across cultures (Tong et al. 2004).

### 3.4 Summary of key concepts

Each of the sociodemographic factors and the 10 key psychosocial and health concepts reviewed above separately and powerfully influence people's circumstances at any point in their lives and throughout their lives. In addition, they interact, with the presence of numerous positive factors enhancing people's chances of wellbeing and of numerous negative factors making hardship and adversity difficult to avoid. A more detailed description of the associations among many of these concepts has been presented in a recent review prepared for FaCSIA in 2005 (Berry et al. 2007), and interested readers can refer to the reference list at the end of this report for extension reading.

### 3.5 Operationalising the concepts

Having identified a priori those concepts and factors that we consider essential to include in our cluster analysis, and having identified our preferred data source, we examined our data source for variables and measures that could tap our key concepts. As any differences between clusters based on the distributions of variables not used in the cluster analysis are particularly informative in evaluating the validity of the cluster solution (Beitchman et al. 2001; Stewart & Trupin 2003), we also needed to identify variables or measures that could tap secondary concepts. Our examination of the HILDA Wave 1 database to locate or construct appropriate measures is documented in the next section.

## 4. Measures and measurement

To avoid the pitfalls of data-mining and other ad hoc approaches to exploratory research discussed in Section 2, this research has been theory-driven. This means we started by identifying our overarching objectives, research questions and aims. Based on these, we chose the concepts that we wanted to include in our analysis in preparation for selecting the variables that would operationalise the concepts. In this section, we present the results of our examination of the HILDA Wave 1 database for raw variables, and derived variables and scales (measures) that could operationalise the key concepts described in Section 3.

### Primary variables

We started by examining the database to select primary variables, as these are the most important variables and the ones on which the clusters would be defined. We selected as primary variables those that directly tapped primary concepts. In the case that there were multiple potentially suitable variables in the dataset, we selected those that were optimal. We defined as optimal the variables that most closely conformed to the following criteria:

- had strong face validity (self-evidently directly assessing the concept)
- were derived from standardised, or systematically developed and validated measures
- were measures based on multiple items (complex concepts are multifaceted and several items are required to measure them appropriately)
- had multi-point response formats (which allows for the sensitive gauging of the degree of expression of the concept in the respondent)
- were objectively measured, or amenable to criterion validation
- had minimal or no missing data, or the least missing data
- were in, or able to be collapsed into, categorical form (see below).

### *Form of variables*

We have argued that two-step clustering is the most appropriate method of clustering for these data. One reason for this is that, unlike other methods of clustering, the two-step method can accommodate models in which the variables are mixed categorical and continuous. Nevertheless, one of the potential limitations of two-step clustering is that it may overweight categorical variables relative to the continuous variables. The categorical variables can, as a result, dominate the analysis at the expense of continuous variables (Bacher, Wenzig & Vogler 2004). For this reason, where possible, we have selected categorical variables or, where appropriate, transformed continuous variables into categorical variables.

One final consideration was, where possible, we selected variables and measures that had been validated on or used with other Australian populations.

### Secondary variables

We also paid careful attention to the selection of variables or measures that could tap secondary concepts. Any differences between clusters based on the distributions of variables **not** used in the cluster analysis are particularly informative in evaluating the validity of the cluster solution (Beitchman et al. 2001; Stewart & Trupin 2003). They also make the final profiles more informative. We selected as secondary variables those that:

- tapped primary concepts, but did not meet the variable criteria to the same standard as the primary variables
- tapped concepts that expanded on primary concepts

- tapped concepts related to primary concepts
- were generally relevant to our overarching objective of providing an innovative perspective on the question of whether it would be possible, from a social policy perspective, to generate new ways of thinking about what kinds of Australians there are and what they need.

Our conclusions about which variables to use to tap each concept, our consideration of whether they should be primary or secondary variables and our reasons for our decisions are presented below in the order in which they appear in Section 3. This discussion is summarised in Table 3.

## 4.1 Age, sex, Indigenous status and ethnicity

### *Age and sex*

Consistent with a preference for categorical variables as our primary variables, we computed an age group variable based on a life-course developmental perspective.

There were six groups: very young adults (15 to 25 years); young adults (26 to 39 years); mid-life adults (40 to 55 years); retiring adults (56 to 65 years); adults in young old-age (66 to 79 years); and adults in late old-age (80+ years). To enhance profile descriptions, we included age in two other formats as secondary variables. These were (i) age in years, a HILDA derived variable that we included so we could report the mean age of each cluster, and (ii) generation, derived for the study based on the date of data collection. Generations included the Net Generation, sometimes called Generation Y, (aged 15 to 24 years at the time of data collection), Generation X (25 to 39 years), the Baby Boomers (40 to 59 years), the ‘Long Civic’ Generation (60 to 79 years), so called because it was a long generation of particularly civic-minded people (Putnam 2000), and Elders (80+ years). Respondents’ sex was included as a primary variable using the raw item collected for the dataset.

### *Indigenous status and ethnicity*

There were large amounts of missing data in our sub-sample for Indigenous status (N=1,492, 24.7 per cent), as there were in the full Wave 1 dataset. However, at 1.8 per cent of the Wave 1 dataset, and 1.9 per cent of our sub-sample, the proportion of respondents identifying themselves as Indigenous Australians was not significantly different from, and slightly exceeded, the Australian Bureau of Statistics population estimate of 1.7 per cent (Wooden, Freidin & Watson 2002). There were no missing data for a variable asking respondents to identify their country of birth. With 4,420 (73.3 per cent) respondents stating that they had been born in Australia, and 1,492 (24.8 per cent) identifying countries other than Australia, the latter accounted for **exactly** the same number and proportion of respondents in our sub-sample as there were missing data for Indigenous status. Examination of cross-tabulations confirmed that those with missing data for the Indigenous status item were those born in countries other than Australia. We could therefore combine non-missing data for the variable on Indigenous status with complete data for the country of birth variable to compute a single categorical variable for Indigenous status and ethnicity.

The groupings that we were able to compute included those who identified themselves as (i) Australian born, Indigenous participants, (ii) Australian born, non-Indigenous participants, (iii) participants who were New Australians from English-speaking backgrounds, and (iv) participants who were New Australians from non-English speaking backgrounds. By combining the variables in this manner, we were able to overcome the problem of missing data and include Indigenous status and ethnicity in our analysis in a form suitable for use as a primary variable. This new variable had no missing data.

The proportions of men and women for each categorical variable, and mean scores for continuous variables for the sub-sample and for each cluster, are presented in Tables 4 and 5 respectively.

Table 3: Primary and secondary variables, and evaluation of measures

| Concept and measures   | Source of measure  | Evaluation criteria for acceptability of variables and measures |                         |                    |                      |                                |                               |                      | Suitability of measure |
|--|--------------------|---|-------------------------|--------------------|----------------------|--------------------------------|-------------------------------|----------------------|------------------------|
|  |                    | Face validity /directly relevant                                | Standardised or similar | Multi-item measure | Multi-point response | Objective, or can be validated | Acceptable missing data (<5%) | Categorical variable |                        |
| <b>Sex, age &amp; ethnicity</b>  |                    |   |                         |                    |                      |                                |                               |                      |                        |
| Sex  | Raw item           | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                             | ✓                    | Primary                |
| Life-stage based age groupings (15–25, 26–39, 40–55, 56–65, 66–79, 80+)                                      | Researcher derived | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                             | ✓                    | Primary                |
| Age in years   | HILDA derived      | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                             | ✗                    | Secondary              |
| Generation based age groupings (Net Generation, Generation X, Baby Boomers, Long Civics, Elders)             | Researcher derived | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                             | ✗                    | Secondary              |
| Country of birth (Australia, other English-speaking, non-English-speaking)                                   | HILDA derived      | ✓   | ✗                       | n/a                | n/a                  | ✓                              | ✗                             | ✗                    | Secondary              |
| Indigenous status (Aboriginal, TSI, both)  | Raw item           | ✓   | ✗                       | n/a                | n/a                  | ✓                              | ✗                             | ✓                    | Secondary              |
| Indigenous status and ethnicity  | Researcher derived | ✓   | ✗                       | n/a                | n/a                  | ✓                              | ✓                             | ✓                    | Primary                |
| <b>Adult relationships</b>   |                    |   |                         |                    |                      |                                |                               |                      |                        |
| Relationship status (married/de facto, separated/divorced, widow, never married)                             | Researcher derived | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                             | ✓                    | Primary                |
| Family type and structure (couples without children, couples with children, single parents, singles, others) | Researcher derived | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                             | ✓                    | Primary                |
| Years married  | HILDA derived      | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✗                             | ✗                    | Secondary              |
| Years de facto   | HILDA derived      | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✗                             | ✗                    | Secondary              |
| Satisfaction with partner  | Raw item           | ✓   | ✗                       | ✗                  | ✓                    | ✗                              | ✗                             | ✗                    | Secondary              |

Table 3: Primary and secondary variables, and evaluation of measures (continued)

| Concept and measures  | Source of measure  | Evaluation criteria for acceptability of variables and measures |                         |                    |                      |                                |                               |                      | Suitability of measure |           |
|---|--------------------|---|-------------------------|--------------------|----------------------|--------------------------------|-------------------------------|----------------------|------------------------|-----------|
|   |                    | Face validity /directly relevant                                | Standardised or similar | Multi-item measure | Multi-point response | Objective, or can be validated | Acceptable missing data (55%) | Categorical variable |                        |           |
| <i>Parenting</i>  |                    |   |                         |                    |                      |                                |                               |                      |                        |           |
| Total number of children living in household  | Researcher derived | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                             | ✓                    | X                      | Primary   |
| Has non-resident children (<50% time) aged 0–14 years   | Researcher derived | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                             | ✓                    | X                      | Primary   |
| Separation and divorce  |                    |   |                         |                    |                      |                                |                               |                      |                        |           |
| Ever separated or divorced yes/no   | Researcher derived | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                             | ✓                    | ✓                      | Primary   |
| Satisfaction with former partner  | Raw item           | ✓   | X                       | X                  | ✓                    | X                              | X                             | X                    | X                      | Secondary |
| <b>Economic participation</b>   |                    |   |                         |                    |                      |                                |                               |                      |                        |           |
| <i>Employment</i>   |                    |   |                         |                    |                      |                                |                               |                      |                        |           |
| Employment status (full-time or part-time paid employment not in paid employment (<1 year or >1 year), home duties, retired, non-working student/other) | Researcher derived | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                             | ✓                    | ✓                      | Primary   |
| Number of paid jobs   |                    |   |                         |                    |                      |                                |                               |                      |                        |           |
| Years unemployed and looking for work   | HILDA derived      | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                             | X                    | X                      | Secondary |
| Overall job satisfaction  | HILDA derived      | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                             | ✓                    | X                      | Secondary |
| <i>Welfare participation</i>  |                    |   |                         |                    |                      |                                |                               |                      |                        |           |
| Income support receipt type (none, unemployed, studying, partnered parent, unpartnered parent, disability or sickness, other)                           | Raw item           | ✓   | ✓                       | X                  | ✓                    | X                              | ✓                             | ✓                    | X                      | Secondary |
| Income support receipt type (none, unemployed, studying, partnered parent, unpartnered parent, disability or sickness, other)                           | Researcher derived | ✓   | ✓                       | X                  | n/a                  | X                              | ✓                             | ✓                    | ✓                      | Primary   |

Table 3: Primary and secondary variables, and evaluation of measures (continued)

| Concept and measures  | Source of measure  | Evaluation criteria for acceptability of variables and measures |                         |                    |                      |                                |                                |                      | Suitability of measure |           |
|---|--------------------|---|-------------------------|--------------------|----------------------|--------------------------------|--------------------------------|----------------------|------------------------|-----------|
|   |                    | Face validity /directly relevant                                | Standardised or similar | Multi-item measure | Multi-point response | Objective, or can be validated | Acceptable missing data (<=5%) | Categorical variable |                        |           |
| <i>Financial circumstances</i>  |                    |   |                         |                    |                      |                                |                                |                      |                        |           |
| Equivalised disposable income   | Researcher derived | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                              | ✓                    | ✗                      | Primary   |
| Income support payments as % of equivalised disposable income   | Researcher derived | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                              | ✓                    | ✗                      | Secondary |
| Income support payments >30% of equivalised disposable income (yes/no)  | Researcher derived | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                              | ✓                    | ✓                      | Primary   |
| Housing tenure (owner, buying, renting, other)  | Researcher derived | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✗                              | ✓                    | ✓                      | Secondary |
| Number of financial hardships   | Researcher derived | ✓   | ✗                       | ✓                  | ✓                    | ✗                              | ✓                              | ✓                    | ✗                      | Secondary |
| Satisfaction with financial circumstances   | Raw item           | ✓   | ✗                       | ✗                  | ✓                    | ✗                              | ✓                              | ✓                    | ✗                      | Secondary |
| Credit card balance paid in full monthly (usually, sometimes, rarely)   | Raw item           | ✓   | ✗                       | ✗                  | ✓                    | ✗                              | ✓                              | ✓                    | ✓                      | Secondary |
| <b>Education</b>  |                    |   |                         |                    |                      |                                |                                |                      |                        |           |
| Highest level of educational attainment (incomplete schooling, completed high school, certificate/diploma, tertiary, higher degree) | Researcher derived | ✓   | ✓                       | n/a                | n/a                  | ✓                              | ✓                              | ✓                    | ✓                      | Primary   |
| <b>Mental health &amp; wellbeing</b>  |                    |   |                         |                    |                      |                                |                                |                      |                        |           |
| Mental health groupings: best, middle, worst  | Researcher derived | ✓   | ✓                       | ✓                  | ✓                    | ✓                              | ✗                              | ✓                    | ✓                      | Primary   |
| Mental health continuous scale  | HILDA derived      | ✓   | ✓                       | ✓                  | ✓                    | ✓                              | ✗                              | ✓                    | ✗                      | Secondary |

Table 3: Primary and secondary variables, and evaluation of measures (continued)

| Concept and measures   | Source of measure  | Evaluation criteria for acceptability of variables and measures |                         |                    |                      |                                |  |                      | Suitability of measure |           |
|--|--------------------|---|-------------------------|--------------------|----------------------|--------------------------------|--|----------------------|------------------------|-----------|
|  |                    | Face validity /directly relevant                                | Standardised or similar | Multi-item measure | Multi-point response | Objective, or can be validated | Acceptable missing data ( $\leq 5\%$ ) | Categorical variable |                        |           |
| <b>Mental health &amp; wellbeing (continued)</b>                           |                    |   |                         |                    |                      |                                |  |                      |                        |           |
| General life satisfaction  | Researcher derived | ✓   | X                       | ✓                  | ✓                    | X                              | X                                      | X                    | X                      | Secondary |
| Time pressure  | Raw item           | ✓   | X                       | X                  | ✓                    | X                              | X                                      | X                    | X                      | Secondary |
| Too much spare time  | Raw item           | ✓   | X                       | X                  | ✓                    | X                              | X                                      | X                    | X                      | Secondary |
| <b>Physical health</b>   |                    |   |                         |                    |                      |                                |  |                      |                        |           |
| Physical functioning groupings: best, middle, worst                        | HILDA derived      | ✓   | ✓                       | ✓                  | ✓                    | ✓                              | X                                      | ✓                    | ✓                      | Primary   |
| Physical functioning continuous scale                                      | HILDA derived      | ✓   | ✓                       | ✓                  | ✓                    | ✓                              | X                                      | X                    | X                      | Secondary |
| Perceptions of own health measure  | HILDA derived      | ✓   | ✓                       | ✓                  | ✓                    | ✓                              | X                                      | X                    | X                      | Secondary |
| Self-rated health item (stand-alone item from SF-36)                       | Raw item           | ✓   | ✓                       | X                  | ✓                    | ✓                              | X                                      | X                    | X                      | Secondary |
| Satisfaction with own health   | Raw item           | ✓   | X                       | X                  | ✓                    | X                              | X                                      | X                    | X                      | Secondary |
| <b>Pseudomaturity &amp; early adversities</b>                              |                    |   |                         |                    |                      |                                |  |                      |                        |           |
| Age left home: under 18, 18–21, 21+  | Raw item           | ✓   | X                       | n/a                | n/a                  | X                              | ✓                                      | ✓                    | ✓                      | Primary   |
| Age left school: 15 or under, 16+  | Raw item           | ✓   | X                       | n/a                | n/a                  | X                              | ✓                                      | ✓                    | ✓                      | Primary   |
| <b>Early adversities</b>   |                    |   |                         |                    |                      |                                |  |                      |                        |           |
| Parents were separated or divorced: no, 0–10 years, 11–17 years, 18+ years | Researcher derived | ✓   | X                       | n/a                | n/a                  | X                              | ✓                                      | ✓                    | ✓                      | Primary   |
| Father was unemployed when respondent was 14 years (yes/no)                | Raw item           | ✓   | X                       | n/a                | n/a                  | X                              | X                                      | X                    | ✓                      | Secondary |

Table 3: Primary and secondary variables, and evaluation of measures (continued)

| Concept and measures  | Source of measure  | Evaluation criteria for acceptability of variables and measures |                         |                    |                      |                                |  |                      | Suitability of measure |           |
|---|--------------------|---|-------------------------|--------------------|----------------------|--------------------------------|--|----------------------|------------------------|-----------|
|   |                    | Face validity /directly relevant                                | Standardised or similar | Multi-item measure | Multi-point response | Objective, or can be validated | Acceptable missing data ( $\leq 5\%$ ) | Categorical variable |                        |           |
| <b>Social participation</b>   |                    |   |                         |                    |                      |                                |  |                      |                        |           |
| Frequency of contact with friends and extended family (often, sometimes, rarely)  | Researcher derived | ✓   | X                       | X                  | ✓                    | X                              | ✓                                      | ✓                    | ✓                      | Secondary |
| Currently an active member of sporting/hobby/community-based association (yes/no) | Raw item           | ✓   | X                       | X                  | X                    | X                              | ✓                                      | ✓                    | ✓                      | Secondary |
| <i>Social support</i>   |                    |   |                         |                    |                      |                                |  |                      |                        |           |
| Social support  | Researcher derived | ✓   | X                       | ✓                  | ✓                    | X                              | ✓                                      | ✓                    | X                      | Secondary |
| <b>Substance use</b>  |                    |   |                         |                    |                      |                                |  |                      |                        |           |
| <i>Alcohol consumption</i>  |                    |   |                         |                    |                      |                                |  |                      |                        |           |
| Alcohol consumption category (never has, very rarely/no longer, low risk, risky)  | Researcher derived | ✓   | ✓                       | X                  | ✓                    | X                              | ✓                                      | ✓                    | ✓                      | Secondary |
| <i>Tobacco</i>  |                    |   |                         |                    |                      |                                |  |                      |                        |           |
| Smoking intensity (never, past, light, medium, heavy)                             | Researcher derived | ✓   | ✓                       | X                  | ✓                    | X                              | X                                      | X                    | ✓                      | Secondary |
| Amount per week spent on tobacco  | HILDA derived      | ✓   | ✓                       | X                  | n/a                  | X                              | X                                      | X                    | X                      | Secondary |
| Amount per week spent on tobacco as % equivalised disposable income               | Researcher derived | ✓   | ✓                       | X                  | n/a                  | X                              | X                                      | X                    | X                      | Secondary |

**Table 4: Proportions of women and men for categorical variables for study sub-sample**

| Variable  | Women      |             | Men        |             | Total        |             |
|---|------------|-------------|------------|-------------|--------------|-------------|
|   | N          | %           | N          | %           | N            | %           |
| <b>Age group</b>                                |            |             |            |             |              |             |
| Very young adults (15–25)                       | 382        | 11.5        | 313        | 11.6        | 695          | 11.5        |
| Young adults (26–39)                            | 1,069      | 32.2        | 828        | 30.6        | 1,897        | 31.5        |
| Mid-life adults (40–55)                         | 936        | 28.2        | 797        | 29.5        | 1,733        | 28.7        |
| Retiring adults (56–65)                         | 412        | 12.4        | 371        | 13.7        | 783          | 13.0        |
| Adults in young old age (66–79)                 | 415        | 12.5        | 328        | 12.1        | 743          | 12.3        |
| Adults in late old age (80+)                    | 111        | 3.3         | 67         | 2.5         | 178          | 3.0         |
| <b>Ethnicity</b>                                |            |             |            |             |              |             |
| Australian born: Indigenous                     | 82         | 2.5         | 35         | 1.3         | 117          | 1.9         |
| Australian born: non-Indigenous                 | 2,438      | 73.3        | 1,982      | 73.3        | 4,420        | 73.3        |
| New Australian: English-speaking background     | 373        | 11.2        | 348        | 12.9        | 721          | 12.0        |
| New Australian: non-English speaking background | 432        | 13.0        | 339        | 12.5        | 771          | 12.8        |
| <b>Relationship status</b>                      |            |             |            |             |              |             |
| Never married or de facto                       | 551        | 16.6        | 556        | 20.6        | 1,107        | 18.4        |
| Married or de facto                             | 2,051      | 61.7        | 1,828      | 67.6        | 3,879        | 64.3        |
| Separated or divorced                           | 431        | 13.0        | 249        | 9.2         | 680          | 11.3        |
| Widowed   | 292        | 8.8         | 71         | 2.6         | 363          | 6.0         |
| <b>Family type</b>                              |            |             |            |             |              |             |
| Couples   | 950        | 28.6        | 890        | 32.9        | 1,840        | 30.5        |
| Couples with children                           | 1,173      | 35.5        | 1,068      | 39.5        | 2,241        | 37.2        |
| Single parent families                          | 499        | 15.0        | 159        | 5.9         | 658          | 10.9        |
| Singles   | 591        | 17.8        | 460        | 17.0        | 1,051        | 17.4        |
| Other   | 112        | 3.4         | 127        | 4.7         | 239          | 4.0         |
| Ever divorced (yes)                             | 369        | 11.1        | 312        | 11.5        | 691          | 11.3        |
| Has non-resident children (yes)                 | 582        | 17.5        | 431        | 15.9        | 1,013        | 16.8        |
| <b>Employment status</b>                        |            |             |            |             |              |             |
| Full-time paid employment                       | 954        | 28.7        | 1,566      | 57.9        | 2,520        | 41.8        |
| Part-time paid employment                       | 825        | 24.8        | 289        | 10.7        | 1,114        | 18.5        |
| Not in paid employment (<1 year)                | 30         | 0.9         | 46         | 1.7         | 76           | 1.3         |
| Not in paid employment (>1 year)                | 56         | 1.7         | 98         | 3.6         | 154          | 2.6         |
| Home duties                                     | 710        | 21.4        | 40         | 1.5         | 750          | 12.4        |
| Retired   | 612        | 18.4        | 527        | 19.5        | 1,139        | 18.9        |
| Non-working student, other                      | 138        | 4.2         | 138        | 5.1         | 276          | 4.6         |
| <b>Income support type</b>                      |            |             |            |             |              |             |
| None  | 2,485      | 74.7        | 2,205      | 81.5        | 4,690        | 77.8        |
| Disability Support Pension/sick                 | 91         | 2.7         | 131        | 4.8         | 222          | 3.7         |
| NewStart  | 50         | 1.5         | 116        | 4.3         | 166          | 2.8         |
| Old age related                                 | 184        | 5.5         | 112        | 4.1         | 296          | 4.9         |
| Parenting partnered                             | 96         | 2.9         | 8          | 0.3         | 104          | 1.7         |
| Parenting single                                | 230        | 6.9         | 19         | 0.7         | 249          | 4.1         |
| Student   | 30         | 0.9         | 26         | 1.0         | 56           | 0.9         |
| Other   | 159        | 4.8         | 87         | 3.2         | 246          | 4.1         |
| <b>Income support &gt;30% income (yes)</b>      | <b>957</b> | <b>28.8</b> | <b>518</b> | <b>19.2</b> | <b>1,475</b> | <b>24.5</b> |

**Table 4: Proportions of women and men for categorical variables for study sub-sample (continued)**

| Variable                           | Women        |             | Men          |             | Total        |            |
|------------------------------------|--------------|-------------|--------------|-------------|--------------|------------|
|                                    | N            | %           | N            | %           | N            | %          |
| <b>Education attained</b>          |              |             |              |             |              |            |
| Did not complete high school       | 1,248        | 37.5        | 737          | 27.3        | 1,985        | 32.9       |
| Completed high school              | 430          | 12.9        | 299          | 11.1        | 729          | 12.1       |
| Diploma or certificate             | 1,023        | 30.8        | 1,166        | 43.1        | 2,189        | 36.3       |
| Tertiary degree                    | 557          | 16.8        | 423          | 15.6        | 980          | 16.3       |
| Higher degree                      | 67           | 2.0         | 79           | 2.9         | 146          | 2.4        |
| Left school under 16 years (yes)   | 1,155        | 34.7        | 907          | 33.5        | 2,062        | 34.2       |
| Mental health (worst group)        | 1,003        | 30.2        | 666          | 24.6        | 1,669        | 27.7       |
| Physical functioning (worst group) | 1,159        | 34.9        | 776          | 28.7        | 1,935        | 32.1       |
| <b>Parents divorced (yes)</b>      |              |             |              |             |              |            |
| When a child (0–10 years)          | 321          | 9.7         | 226          | 8.4         | 547          | 9.1        |
| When an adolescent (11–17 years)   | 206          | 6.2         | 142          | 5.3         | 348          | 5.8        |
| When an adult (18+ years)          | 149          | 4.5         | 98           | 3.6         | 247          | 4.1        |
| Left home under 18 years (yes)     | 893          | 26.9        | 653          | 24.1        | 1,546        | 25.6       |
| <b>Total</b>                       | <b>3,325</b> | <b>55.2</b> | <b>2,704</b> | <b>44.8</b> | <b>6,029</b> | <b>100</b> |

**Table 5: Mean scores for continuous variables for whole study sub-sample**

| Variable                                      | Women  |                | Men    |                | Total  |                |
|---|--------|----------------|--------|----------------|--------|----------------|
|   | Mean   | S <sub>x</sub> | Mean   | S <sub>x</sub> | Mean   | S <sub>x</sub> |
| <b>Age</b>                                    | 45.4   | 17.3           | 45.5   | 16.7           | 5.4    | 17.0           |
| <b>Equivalentised disposable income (\$)</b>  | 38,340 | 29,356         | 42,281 | 31,188         | 40,108 | 30,252         |
| <b>Income support as % of total income</b>    | 21.7   | 30.1           | 13.9   | 22.9           | 18.2   | 27.4           |
| <b>Mental health</b>                          | 72.7   | 17.9           | 75.2   | 17.3           | 73.8   | 17.6           |
| Best group                                    | 76.4   | 16.7           | 78.7   | 15.2           | 77.5   | 15.7           |
| Middle group                                  | 74.4   | 16.4           | 76.6   | 15.4           | 75.4   | 16.0           |
| Worst group                                   | 68.0   | 19.6           | 69.0   | 20.1           | 68.4   | 19.8           |
| <b>Physical functioning</b>                   | 80.6   | 24.5           | 83.2   | 23.7           | 81.8   | 24.2           |
| Best group                                    | 100.0  | 0.0            | 100.0  | 0.0            | 100.0  | 0.0            |
| Middle group                                  | 91.4   | 3.9            | 91.7   | 3.8            | 91.5   | 3.9            |
| Worst group                                   | 53.2   | 22.9           | 52.0   | 23.0           | 52.7   | 22.9           |
| <b>Age left home</b>                          | 19.6   | 3.7            | 20.2   | 4.4            | 19.9   | 4.1            |
| <b>Age left school</b>                        | 16.1   | 1.5            | 16.2   | 1.5            | 16.1   | 1.5            |
| <b>Age when parents separated or divorced</b> | 11.8   | 8.3            | 11.8   | 8.2            | 11.8   | 8.3            |
| <b>Total children under 15 in household</b>   | 73     | 1.1            | 65     | 1.1            | 69     | 1.1            |

### Adult relationships

Wave 1 of the HILDA dataset contains items on family background, marital history and relationship satisfaction. These topics are directly relevant to the cluster analysis presented in this study. Two researcher-derived variables tapping current relationships were suitable for use as primary variables for the cluster analysis: relationship status, and family type and structure. Relationship status included four groupings: married or de facto, separated or divorced, widowed, or never married. Family type and structure included five groupings: couples without children, couples with children, single parent families, singles, and other family types. Two derived variables and one raw item from the dataset were suitable for use as secondary variables. These were the duration of the respondent's current marriage in years, the duration of the respondent's current de facto

relationship in years, and a single item asking how satisfied the respondent was with the current relationship (relevant to all respondents in relationships, whether they were married, de facto, or not living together). This was measured on an 11-point scale from extremely dissatisfied (0) to extremely satisfied (10).

### *Parenting*

Responsibility for parenting was measured by two researcher-derived primary variables. One was the total number of children aged less than 15 years that were living in the household. No distinction was made between the respondents' own biological or adopted children and any other children for whom they had parent-like responsibility. The other variable was whether the respondent had any non-resident children aged 0 to 14 years. Non-resident children were defined as the respondent's own biological or adopted children that lived elsewhere for more than 50 per cent of their time.

### *Victimisation and violence*

There were no variables in the dataset that could tap or approximate the measurement of experiences of victimisation and violence.

### *Separation and divorce*

Separation and divorce, and issues surrounding such events, were assessed using two variables. The first was a researcher-derived nominal categorical variable that captured whether the respondent had **ever** been separated or divorced. This was suitable for use as a primary variable. However, while details of current and past relationship status indicated 691 members of the sub-sample had ever divorced, 868 respondents indicated who had initiated their separation (self, partner, or both) in response to an item elsewhere in the dataset.

This suggests underreporting of 'ever divorced' status. As we could not confirm this, we used the first, more conservative estimate. The second variable was suitable for use as a secondary variable. It was a raw item from the dataset assessing how satisfied the respondent was with her or his relationship with the most recent former partner. This was measured on an 11-point scale from extremely dissatisfied (0) to extremely satisfied (10).

### **Aspirations, values, attitudes**

The dataset contains three items on attitudes to living in Australia, which could be interpreted as attitudes. However, these items were limited in scope, and not validated, or similar. There were no variables in the dataset that were appropriate to tap or approximate the measurement of aspirations or values.

### **Economic participation, financial circumstances and education**

A total of five primary variables and eight secondary variables were selected or constructed to assess respondents' economic participation, financial circumstances, and educational attainment.

#### *Economic participation*

Respondents provided detailed information on their employment status that was reduced to a researcher-derived primary variable with seven groupings. The groupings were full-time paid employment, part-time paid employment, not in paid employment (less than one year), not in paid employment (more than one year), home duties, retired, and non-working student or other. Three further relevant items were suitable as secondary variables. Two were derived variables from the dataset, total number of paid jobs, and years unemployed and looking for work. The third was a raw item on overall job satisfaction. This last was measured on an 11-point scale from extremely dissatisfied (0) to extremely satisfied (10).

#### *Welfare participation*

A single researcher-derived primary variable captured welfare participation. It assigned respondents to one of seven groupings, including none, unemployed, studying, parenting (partnered), parenting (unpartnered), disability or sickness-related, and other.

## Financial circumstances

Two primary variables were used to assess financial circumstances. The first was equivalised disposable income. This was a researcher-derived continuous variable; its construction and use are discussed in the next section. The other was a researcher-derived categorical variable that indicated whether the respondent derived at least 30 per cent of equivalised disposable income from income support payments (yes or no). This is a measure of extreme dependence on income support, and is therefore a measure of financial vulnerability and an indicator of hardship. Four researcher-derived items and one raw item from the dataset were selected as secondary variables. The researcher-derived items included income support as a proportion of equivalised disposable income, housing tenure (owning, buying, renting or other), number of financial hardships, and frequency of discharging credit card amounts each month. The number of financial hardships was computed by adding the number of items endorsed from a list of seven items in the dataset. The frequency of discharging credit card amounts each month was computed by collapsing the five original response groupings to three: usually, sometimes, rarely. The raw item that we used as a secondary variable was satisfaction with financial circumstances. This was measured on an 11-point scale from extremely dissatisfied (0) to extremely satisfied (10).

## Equivalised disposable income

Indicators of economic participation and financial circumstances are important in discriminating between types of people and households, and vary systematically across different types of households. Income is one of the most important of such indicators. Equivalised disposable income has been calculated for use in this study because it takes account of the number and ages of members of a household whose needs must be met by the total post-tax household income. Equivalised disposable household income has been calculated using the modified Organisation for Economic Co-operation and Development (OECD) scale (Hagenaars, de Vos & Zaidi 1994). Though there are numerous methods of equivalising income, and no consensus about which is preferable, the modified OECD method is widely used, including for country-level analyses of Australian data.

In this regard, we acknowledge evidence that different members of a household can and do experience different access to household income and resources, and equivalised values do not account for this variation. These disparities can be particularly intense within marriage and can be associated with considerable role conflict for women (Lundberg & Pollak 1996). Nevertheless, equivalising income provides at least some adjustment of raw household income to take account of household structure and type.

This is particularly important when a household includes children, who consume but do not usually contribute to household income. In 2000, across 27 OECD countries, the equivalised disposable income of households with children averaged around 80 per cent of that of households with no children (Forster & d'Ercole 2005). The OECD ranked all 27 countries according to the amount of equivalised disposable income in households with children as a proportion of that of adult-only households. Australia ranked in the lowest 25 per cent in this listing (Forster & d'Ercole 2005). Because of this, particularly in Australia, there is a greatly elevated risk of financial adversity in households with children, and it is especially important to include **equivalised** income in Australian studies.

Using the OECD method, equivalised income is calculated based on household disposable income, which is the sum of the disposable post-tax incomes of all members of the household. Household disposable income is adjusted for the number of persons in the household, weighted according to their assumed needs. In the case of the modified OECD scale, the first adult in the household is attributed a weighting of 1, the second and subsequent adults are attributed a weighting of 0.5 each, and children receive a weighting of 0.3 each. Equivalised household disposable income is then attributed equally to all members of the household, such that they each receive an 'equivalent disposable income' (Burniaux et al. 1998).

## *Education*

The highest level of educational attainment was assessed via a single researcher-derived categorical variable, and was included as a primary variable in the cluster analysis. There were five groupings: incomplete secondary schooling, completed secondary schooling, certificate or diploma, tertiary degree, and higher degree.

### **Emotional intelligence and optimism**

There were no variables in the dataset that could tap or approximate the measurement of emotional intelligence or directly measure optimism. Optimism may be a key component of emotional intelligence, or is a key correlate of it. Either way, it is important in its own right as a predictor of success in life and a powerful correlate of a range of health outcomes. Measures of mental health were the closest available correlates of optimism in the dataset, as depression and optimism are strongly negatively related. However, it would not be appropriate for our purposes (or technically feasible) to make assumptions about respondents' emotional intelligence based on mental health screening scores.

### **Mental health**

Mental health was measured using the transformed mental health sub-scale of the SF-36, a widely used and extensively validated health screening instrument (Ware et al. 1993) that has been used in previous research using the HILDA dataset (Butterworth & Crosier 2004). Scores on the mental health sub-scale range from 0 to 100, with higher scores representing better mental health. Cut-points for various diagnoses vary, but a commonly used criterion is that scores of less than 50 indicate poor mental health. As noted in Section 2, unlike other methods of clustering, the two-step method can accommodate models in which the variables are mixed categorical and continuous. Nevertheless, one of the potential limitations of two-step clustering is that it may overweight categorical variables relative to the continuous variables. The categorical variables can, as a result, dominate the analysis at the expense of continuous variables (Bacher, Wenzig & Vogler 2004). For this reason, where possible, we have selected categorical variables or, where appropriate, transformed continuous variables into categorical variables.

Given the vital role mental health plays in people's circumstances, it was particularly important to include a measure of mental health in a format in which it would not be underweighted in the analysis. Continuous scores for mental health were therefore converted, based on mean scores, into three groupings representing those with the best (N=2,330, 38.6 per cent), middle (N=2,030, 33.7 per cent), and the worst (N=1,669, 27.7 per cent) mental health scores. Respondents were not quite evenly distributed among the groupings, with fewer people in the worst category, reflecting the skewed distribution of mental health scores in the population and in this sub-sample. The primary variable in our analysis was mental health tertiles, and continuous scores were reported as a secondary variable to aid cluster description.

### **Physical health**

Physical health was measured using the transformed physical functioning sub-scale of the SF-36, as described above (Ware et al. 1993). Scores on the physical functioning sub-scale range from 0 to 100, with higher scores representing better physical functioning. Cut-points for various diagnoses vary, but a commonly used criterion is that scores of less than 60 indicate poor physical functioning. As noted above in the case of mental health, it was vital to include a measure of physical functioning in a format in which it would not be underweighted in the analysis. Continuous scores for physical functioning were therefore converted, based on mean scores, into three groupings.

These included those with the best (N=1,907, 31.6 per cent), middle (N=2,187, 36.3 per cent), and the worst (N=1,935, 32.1 per cent) physical functioning. Respondents were approximately evenly distributed among the groupings, reflecting the distribution of physical functioning scores in the population and in this sub-sample.

The primary variable in our analysis was physical functioning tertiles, and continuous scores were reported as secondary variables to aid cluster description. We also used two additional secondary variables, self-rated health and satisfaction with own health. The former is a one-item question asking respondents to rate their health on a five-point scale from excellent to poor. While this is a single item measure, and entirely subjective, in a review of 27 community studies in health epidemiology, perceived health ('self-rated' health) was a valid and accurate predictor of mortality, including across cultures (Idler & Benyamini 1997). The second item was another raw item from the dataset asking respondents to rate their satisfaction with their own health on an 11-point scale from extremely dissatisfied (0) to extremely satisfied (10).

## **Pseudomaturity and childhood adversities**

### *Pseudomaturity*

Two items in the HILDA dataset ask respondents to state (i) their age when they first moved out of home and (ii) their age when they left school.<sup>3</sup> There were only one and nine missing data points in our sub-sample for each respectively, which comfortably met our missing data criterion. However, these data were not based on a standardised measure (or some equivalent), and there was no way of validating participants' responses. Nevertheless, since there were few variables in the dataset that we could use to tap this important concept, we included age of leaving home and of leaving school as primary variables.

We computed groupings for each. For age of leaving home, there were three groupings (under 18, 18 to 21, and over 21), reflecting roughly equal categories.

That one-third of Australians had left home before age 18 is roughly consistent with other Australian data. Among four cohorts of Australians born in 1961, 1965, 1970 and 1975, between 70 and 80 per cent were still living at home at age 18 (Hillman & Marks 2002). We focused in the present study on those who had left home before attaining the age of 18 years, in contrast to the other two categories.

For age of leaving school, there were two groupings reflecting extremely premature school leaving (15 years or under) and completion of at least Year 10 or equivalent (16 years or over). This variable was used to complement the variable indicating educational level, and help highlight extreme disadvantage. Age in years of leaving school and of leaving home was retained as a secondary variable in the analysis to add richness to the profile descriptions.

### *Childhood adversities*

We used two indicators of early adversity, father's unemployment in the family of origin, and parental separation or divorce. The first indicator was an item asking respondents whether their father had been unemployed for six months or more when the respondent was aged 14 years. With missing data of N=462 (7.7 per cent), this item could not be included as a primary variable, but was included as a secondary variable in our analyses.

### **Parental separation or divorce**

The second indicator of childhood adversity we used was about parental separation or divorce. There were large amounts of missing data in our sub-sample for an item asking respondents if their parents had ever separated or divorced (N=1,084, 18.0 per cent). In addition, only 527 (8.7 per cent) respondents endorsed the item, with 4,418 (73.3 per cent) of those responding stating their parents had never separated or divorced. This suggests substantial underreporting of parental separation in our sub-sample. However, this could be a sensitive issue and it is not unusual for survey participants to avoid responding to sensitive questions. It is often advisable, therefore, to attempt to obtain and cross check such information using more than one question, or to obtain it indirectly.

The question asking respondents if their parents had ever separated or divorced was followed up by another question asking what age the respondent was the first time this happened. Data for this item included 1,142 (18.9 per cent) respondents who reported their age at the time of their parents' first separation or divorce, approximately the expected rate. Among these respondents, 547 (9.1 per cent) were children aged 0 to 10 years, 348 (5.8 per cent) were adolescents aged 11 to 17 years, and 247 (4.1 per cent) were adults aged 18 years and over when their parents separated or divorced. There were 4,887 (81.1 per cent) missing data, corresponding approximately to expected rates for those whose parents have never separated or divorced.

Cross-tabulations confirmed that all but nine of the respondents with missing data for the item asking if their parents had divorced were among those who reported their age at the time of the divorce. Based on this analysis, we inferred that 1,142 (18.9 per cent) respondents had experienced their parents' separation or divorce, 895 of them (14.8 per cent) before turning 18 years of age, and a small proportion as adults. By combining the two divorce items, we were able to derive four groupings.

These were: (i) respondents whose parents did not divorce/missing data; (ii) respondents whose parents separated or divorced when the respondent was a child; (iii) respondents whose parents separated or divorced when the respondent was an adolescent; (iv) respondents whose parents separated or divorced after the respondent had attained adulthood. We included parental divorce as a primary variable in our analysis.

### **Social participation**

Social participation is a determining factor in the circumstances of people's lives, and is also heavily dependent on those circumstances. It was therefore vital to try to include some measures of social participation in our analysis. While there were no variables in the dataset that were appropriate for use as primary variables in the cluster analysis, we were able to identify one raw item, and to derive two items, that were suitable for use as secondary variables. The raw item was a categorical variable asking whether the participant was currently an active member of a sporting, hobby or community-based association (yes or no). We derived a second categorical variable by collapsing an item assessing the frequency of contact with friends and extended family into three groupings (often, sometimes, rarely).

A composite social support score was derived from 10 social support items contained in the self-complete questionnaire. Five of these were reverse scored (negatively worded, indicating a deficit in social support). We reversed these items to convert them to the positive.

There were 5,602 respondents (92.9 per cent) with no missing data. For these respondents, we summed the 10 items and divided by 10 to produce a mean score ( $M=5.32$ ,  $S_x=0.99$ ). For respondents with one ( $N=174$ ) or two ( $N=23$ ) missing values, we summed the completed items and divided by nine and eight respectively ( $M=5.12$ ,  $S_x=0.99$ , and  $M=5.34$ ,  $S_x=1.14$  respectively). Respondents with more than two missing data points ( $N=230$ , 3.8 per cent) were not assigned a score but were recorded as having missing data for the social support scale.

### **Substance use**

Wave 1 of the HILDA dataset contains questions on tobacco and alcohol consumption, but no other substances. Participants were asked, 'do you smoke cigarettes or any other tobacco product?' They were given the option to respond 'no, I have never smoked'; 'no, I have given up smoking' and 'yes'. If they responded 'yes', they were also asked how much they spent on cigarettes and tobacco in an average week. We used an estimate of the average cost of a cigarette in Australia (approximately 40c per stick, VicHealth 2005) to distinguish light, medium and heavy smokers.

Light smoking was defined as smoking less than 10 cigarettes per day. On average (at 40 cents per stick) this would cost less than \$28 per week. Medium consumption (10 to 19 cigarettes per day) would cost \$28 to \$55 per week, and heavy consumption (>20 cigarettes per day) would cost \$56 or more per week. Though the cost of cigarettes varies by brand, and also by the type of product (roll your own compared to tailor-made cigarettes), these definitions enabled us to compute with a reasonable degree of validity a variable tapping smoking intensity. This meant we could investigate the possibility that heavier smoking might be associated with particular clusters.

Participants were asked how often they drank alcohol and, if they currently consumed, how many standard drinks they would usually have on a day when they had an alcoholic drink. A standard drink was defined as a small glass of wine, a 285 ml glass of regular beer, a nip of spirits, or a mixed drink. First, two non-drinking groups were identified—those who reported that they had never drunk alcohol, and past drinkers and/or those who drank very rarely. For respondents who did not fall into one of these two groupings, the quantity and frequency items were used to estimate consumption per week. The National Health and Medical Research Council's Australian Alcohol Guidelines (2001) were used to distinguish participants drinking at levels considered to risk harm in the long-term (women: >14 standard drinks per week; men: >28 standard drinks per week) from low-risk drinkers.

### **Temperament and personality**

There were no variables in the dataset that could tap or approximate the measurement of temperament and personality. Mental health problems are highly (negatively) correlated with the personality dimension 'emotional stability' such that it can be assumed that those reporting symptomatic mental health status would be likely to attain low scores on emotional stability. However, it would not be appropriate for our purposes (or technically feasible) to make assumptions about respondents' emotional stability based on mental health screening scores. Even if we did, we would only be tapping one facet of personality.

## **4.2 Summary of selection of primary and secondary variables**

We were able to locate or construct variables and measures to tap part or all of the concepts of:

- adult relationships, except for victimisation and violence
- economic participation
- education
- financial circumstances
- mental health
- physical health
- pseudomaturity
- childhood adversities
- social participation
- substance use.

Table 4 shows the proportions of women and men in this sample for each categorical variable, while Table 5 shows sample mean scores for continuous variables.

We were not able to measure:

- aspirations, values or attitudes
- emotional intelligence and optimism
- temperament and personality.

Wave 5 of HILDA contains a brief measure of personality, and this would offer the opportunity to gain some insight into the operation of this important factor in terms of groupings of Australians based on sociodemographic and psychosocial factors.



## 5. Major groupings of Australians

The primary aim of this section is to provide a preliminary assessment of whether participants in the HILDA Survey may be grouped in a statistically sound, meaningful and scientifically useful way into types based on key sociodemographic, psychosocial and health factors. A second aim, essential to addressing the main aim, is to conduct the analyses necessary for the preparation of profiles to describe the characteristics of each type based on primary and secondary factors, as described in Sections 3 and 4 of this report. This will provide the basis for the final evaluation of the cluster solution and the appropriateness of the use of this technique for social policy purposes using large, nationally representative datasets.

### 5.1 Overview of results: a five-cluster solution

The results of preliminary analyses for this study were presented at FaCSIA's Social Policy Research Conference in 2005. Following feedback on these analyses, further work was conducted in constructing variables to include in the analysis—specifically in relation to the handling of missing data. As a result of resolving some of the missing data issues, it was possible to include two additional concepts among the primary variables, parental divorce (and respondent's age at the time of the divorce), and ethnicity. Details of these procedures are documented in Section 4. Preliminary analysis not including these variables had generated a four-cluster solution for the first order cluster analysis. The results of the final analyses for this study generated a very similar solution, as would be expected. The addition of these two concepts, and refinements that were made to other variables we included, resulted in a more sophisticated five-cluster solution to the first order cluster analysis. This refined solution is presented and evaluated in this and the next section.

To summarise, two-step clustering was used for this analysis. Proximities were calculated using log-likelihood distances because these are required for analyses using a mix of categorical and continuous data. Because log-likelihood distances were calculated, clustering was based on standardised scores. The most important evaluation criteria for the solutions were substantive, as is appropriate with the use of exploratory techniques, and included meaningfulness, scientific usefulness, and parsimony.

Additional criteria were statistical, including two indices of change in the agglomeration schedule, Schwarz's Bayesian Criterion and Akaike's Information Criterion. To assist in determining an appropriate cut-point in the agglomeration schedule for the number of clusters, the ratio of change in the agglomeration schedule from step to step in the clustering process was calculated.

Table 6 presents the statistical results of the cluster analysis based on primary sociodemographic, psychosocial and health factors. In presenting the results of the agglomeration procedure, statistics for the first 15 steps have been reported. This is arbitrary, enough to show the results of the analysis clearly, and fewer or more steps could have been reported. For both methods of calculating agglomeration schedules, the ratio of change indicated a clear cut-point between five and six clusters, as shown in the table, indicating a five-cluster solution.

**Table 6: Agglomeration schedules and ratios of change for a cluster analysis of HILDA participants using Schwarz's Bayesian Criterion and Akaike's Information Criterion**

| Number of clusters | Schwarz's Bayesian Criterion |                 | Akaike's Information Criterion |                 |
|--------------------|------------------------------|-----------------|--------------------------------|-----------------|
|                    | Criterion statistic          | Ratio of change | Criterion statistic            | Ratio of change |
| 1                  | 192,897.26                   |                 | 193,262.19                     |                 |
| 2                  | 177,322.56                   | 1.00            | 177,302.43                     | 1.00            |
| 3                  | 166,488.62                   | 0.70            | 166,083.42                     | 0.70            |
| 4                  | 160,315.30                   | 0.40            | 159,525.03                     | 0.41            |
| 5                  | 155,465.40                   | 0.31            | 154,290.07                     | 0.33            |
| 6                  | 153,420.86                   | 0.13            | 151,860.46                     | 0.15            |
| 7                  | 151,484.81                   | 0.12            | 149,539.34                     | 0.15            |
| 8                  | 149,656.53                   | 0.12            | 147,325.99                     | 0.14            |
| 9                  | 147,912.17                   | 0.11            | 145,196.56                     | 0.13            |
| 10                 | 146,361.35                   | 0.10            | 143,260.68                     | 0.12            |
| 11                 | 145,156.60                   | 0.08            | 141,670.86                     | 0.10            |
| 12                 | 144,020.92                   | 0.07            | 140,150.11                     | 0.10            |
| 13                 | 143,441.57                   | 0.04            | 139,185.69                     | 0.06            |
| 14                 | 142,869.88                   | 0.04            | 138,228.93                     | 0.06            |
| 15                 | 142,431.06                   | 0.03            | 137,405.05                     | 0.05            |

Note: Line in table indicates cut-point.

To evaluate the meaningfulness and interpretability of this solution, it is necessary to examine the content of the clusters. This requires some explanation, which follows in the next sections. In terms of the criterion of parsimony, reducing a dataset of over 6,000 respondents to five fairly homogeneous groupings summarises the data to a substantial degree and produces a manageable set of groupings of participants.

In addition, it is broadly consistent with, and compares favourably to, the results of first order cluster analyses that have been published, including with those presented in Section 2. From the point of view of scientific usefulness and policy applicability, a five-cluster solution is likely to be helpful. But again, a decision about this matter needs to follow interpretation of the content of the clusters.

## 5.2 Five major groupings of Australians: interpreting a five-cluster solution

The five clusters included four clusters of approximately equal sizes (numbers ranged from 1,228 to 1,550), and one smaller cluster (N=788). As Table 7 shows, the groups differed significantly from each other on all of the 18 primary variables included in the cluster analysis. The primary concepts and variables were selected based on a review of published scientific evidence of their established importance in shaping people's circumstances in life, so it would have been surprising if they had failed to contribute to discriminating among types of Australians. Nevertheless, the finding that all of them contributed significantly to defining the clusters indicates the appropriateness of the selection of primary concepts and construction of variables for this study.

A summary of the characteristics of each cluster in terms of the primary variables is presented below.

### Cluster 1

Cluster 1 was a group of 1,292 respondents, the small majority of whom were women (60 per cent), almost all of whom were aged over 55 years, and over 80 per cent of whom described themselves as retired. At 25 per cent of the group, widows were substantially overrepresented in this cluster. So, too, were people who had been divorced at least once, and New Australians from English-speaking backgrounds, though they were less strikingly

overrepresented than the widows. The majority of members of this group were couples (56 per cent), more than would have been expected by chance, and singles (33 per cent) were also overrepresented, reflecting the large proportion of widows in this cluster. Respondents in this group neither had children under the age of 15 years living at home, nor non-resident children.

With a mean equivalised disposable income of \$25,188 ( $S_x = \$16,414$ ), this was a low-income group. Income support receipt was substantially more common in this group than in other groups, particularly age-related payments; more than half of the group members were reliant on income support for 30 per cent or more of their income.

As was common when members of this cluster were of school age, a majority of respondents had not completed their secondary education, and 71 per cent had left school early, before reaching the age of 16. Also consistent with their age profile, nearly three-quarters of this group fell into the worst category of physical functioning. This was not the case for their mental health, with respondents falling into the worst mental health category no more or less frequently than would have been expected by chance. In terms of early adversity, only one in five respondents—less than would have been expected by chance—had left home before turning 18, and a small 8 per cent had experienced their parents' separation or divorce. This group is tentatively named 'Retirees'.

### **Cluster 2**

Cluster 2 was a group of 1,228 people with even numbers of men and women. The large majority were aged between 15 and 55 years, with somewhat more than would have been expected by chance being New Australians from English-speaking backgrounds. All respondents in this group described themselves as being married or de facto, with 86 per cent stating they were currently living with someone as a couple. A relatively large 16 per cent had been divorced at least once. Respondents in this group did not have children under the age of 15 years living at home, or any non-resident children. With a mean equivalised disposable income of \$63,451 ( $S_x = \$43,224$ ), this was the highest-income group in the study; almost none of the group members were reliant on income support for any of their income, and none for 30 per cent or more of it. More than one-quarter of these respondents had completed a tertiary qualification or higher degree. Fewer than one in five members of this group fell into the worst category for physical functioning, and the same was true for mental health, making this the healthiest cluster overall. In terms of early adversity, respondents in this group were no more or less likely than chance to have left home early, left school early, or experienced their parents' separation or divorce. This group is tentatively named 'Working Age Couples'.

### **Cluster 3**

Cluster 3 included 1,150 respondents aged 26 to 55 years with even numbers of women and men, and an ethnic mix reflecting that of the general population. All members of the group described themselves as currently married or de facto and living in a couple family with, on average, 1.8 children. At 42 per cent, this group contained the largest proportion of respondents that reported having non-resident children, though only 9 per cent had ever been divorced—less than average.

This group contained by far the largest proportion of respondents describing their occupation as part-time paid employment or home duties, reflecting the large proportion of mothers of children under 15 years in this cluster. With a mean equivalised disposable income of \$38,532 ( $S_x = \$19,432$ ), this group received slightly less than average income, yet very few were in receipt of income support and only 8 per cent relied on it for more than 30 per cent of their income. A large 64 per cent had completed a post-secondary diploma or tertiary degree, with fewer than one in five having left school under the age of 16 years. A very low 13 per cent presented in the worst category of physical functioning, and a low 23 per cent were located in the worst category of mental health. Having not left school or home early, nor experienced their parents' separation or divorce, this group had experienced a low incidence of childhood adversity. This group is tentatively named 'Couples with Children'.

Table 7: Distributions of primary variables by cluster

|                                  | Major clusters                                    |   |  |  | Disadvantaged Australians                                 |
|----------------------------------|---|---|--|--|---|
|                                  | Retirees  | Working Age Couples                               | Couples With Children                  | Working Age Singles                                    |   |
| Sub-sample N (%)                 | 1,292 (21.5%)                                     | 1,228 (20.4%)                                     | 1,550 (25.8%)                          | 1,153 (19.2%)  | 788 (13.1%)   |
| Sex (women)                      | 60%   | n.s.  | n.s.                                   | 47% <sup>#</sup>                                       | 70%   |
| Age group                        | 97% over 55                                       | 87% aged 15–55                                    | 98% aged 26–55                         | 94% aged 15–55   | 79% aged 26–55  |
| Ethnicity                        | 16% New Australians (English-speaking background) | 16% New Australians (English-speaking background) | n.s.                                   | 80% non-Indigenous Australians                         | 9% Indigenous Australians                                 |
| Relationship status              | 25% widows  | 100% married/de facto                             | 100% married/de facto                  | 73% never married                                      | 34% separated or divorced                                 |
| Family type                      | 56% couples, 33% singles                          | 86% couples, no children                          | 100% couples with children             | 60% singles/other, 20% single parents                  | 49% single parents, 29% couples with children             |
| Mean no. of children under 15    | 0.02 <sup>#</sup>                                 | 0.03 <sup>#</sup>                                 | 1.84                                   | 0.16 <sup>#</sup>                                      | 1.38  |
| Has non-resident children (yes)  | 1% <sup>#</sup>                                   | 1% <sup>#</sup>                                   | 42%                                    | 7% <sup>#</sup>  | 34%   |
| Ever divorced (yes)              | 17%   | 16%   | 9% <sup>#</sup>                        | 3% <sup>#</sup>  | n.s.  |
| Employment status                | 82% retired                                       | 71% full-time paid work                           | 43% part-time paid work or home duties | 62% full-time paid work                                | 38% home duties, 15% students, 17% not in paid employment |
| Equivalised disposable income    | \$25,000  | \$63,500  | \$38,500                               | \$48,000   | \$20,000  |
| Income support type              | 18% age-related                                   | 96% none <sup>#</sup>                             | 95% none <sup>#</sup>                  | 88% none <sup>#</sup>                                  | 31% parenting single, 32% NewStart/DSP                    |
| Income support >30% income (yes) | 54%   | 0% <sup>#</sup>                                   | 8% <sup>#</sup>                        | 2% <sup>#</sup>  | 80%   |
| Education attained               | 57% incomplete secondary                          | 27% tertiary or higher degree                     | 64% diploma or tertiary degree         | 24% tertiary or higher degree, 23% completed secondary | 49% incomplete secondary                                  |
| Mental health (worst)            | n.s.  | 19% <sup>#</sup>                                  | 23% <sup>#</sup>                       | n.s.   | 48%   |
| Physical functioning (worst)     | 72%   | 19% <sup>#</sup>                                  | 13% <sup>#</sup>                       | 17% <sup>#</sup>                                       | 47%   |
| Left home under 18 years (yes)   | 22%   | n.s.  | 22% <sup>#</sup>                       | 19% <sup>#</sup>                                       | 48%   |
| Left school under 16 years (yes) | 71%   | n.s.  | 18% <sup>#</sup>                       | 13% <sup>#</sup>                                       | 43%   |
| Parents divorced (yes)           | 8% <sup>#</sup>                                   | n.s.  | n.s.                                   | n.s.   | 34%   |

n.s. Value is not significantly different from expected.

# Value is significantly less than expected at  $p < 0.05$ . All other values are significantly higher than expected at  $p < 0.05$ .

Note: All values differ significantly between groups, except where stated.

#### Cluster 4

Cluster 4 included 1,153 respondents, with slightly more men than women, and the large majority aged between 15 and 55 years. A large 80 per cent were non-Indigenous Australian-born participants. Nearly three-quarters reported having never married, consistent with a very low 3 per cent that had ever divorced. A substantial 60 per cent described themselves as single, or living in other household types (such as group houses), and one-fifth were single parents, more than would have been expected by chance. Overall, however, few had children under 15 years living with them (on average, 0.16 children each), or non-resident children (7 per cent). At nearly two-thirds of respondents, people in full-time paid employment were overrepresented in the group. This was reflected in their somewhat higher than average equivalised household disposable income (\$48,099;  $S_x = \$26,682$ ), very low rates of reliance on income support, and near absence of people reliant on income support for more than 30 per cent of their income. Almost one-quarter of respondents in this group had completed a tertiary or higher degree, and another one-quarter had completed secondary school, both in excess of what would have been expected by chance.

In terms of health, respondents appeared no more or less frequently than expected in the worst category for mental health and, at only 17 per cent, substantially less frequently than expected in the worst category for physical functioning. This was therefore a fairly healthy group. The incidence of early childhood adversity in this group was low. Fewer than one in five had left home under the age of 18, only 13 per cent had left school early, and respondents were no more or less likely than would have been expected by chance to have experienced their parents' separation or divorce. This group is tentatively named 'Working Age Singles'.

#### Cluster 5

Cluster 5 was around half the size of the other clusters, including 788 respondents. At 70 per cent, the large majority were women, and a very large majority were aged between 26 and 55 years. The group contained a striking overrepresentation of Indigenous Australians (9 per cent, compared to a population prevalence of less than 2 per cent). Though the proportion of people reporting that they had ever divorced was no different from the sample mean, more than one-third described themselves as currently separated or divorced and nearly half were living as single parent families. Respondents had on average 1.38 children under the age of 15 living with them, and more than one-third had non-resident children, second only to the couple families with children. At 29 per cent, couple families with children were underrepresented in this group. A very large 38 per cent described their employment status as home duties, and students (15 per cent) and people not in paid employment (17 per cent) were also markedly overrepresented.

Consistent with these characteristics, this was a very low-income group. With a mean equivalised disposable income of only \$19,847 ( $S_x = \$11,279$ ), compared to a mean of \$40,108 ( $S_x = \$30,252$ ), these respondents received less than half average income for this sub-sample. Four in every five members of this group were reliant on income support for more than 30 per cent of their income. This included nearly one-third of respondents who were in receipt of Parenting Payment (Single), and another one-third reliant on NewStart or Disability Support Pension (DSP) payments. Almost one-half of respondents had not completed their secondary education, strikingly above what would have been expected by chance. With nearly half of this group in the worst category for mental health and also for physical health, this was by far the unhealthiest group overall in the study. In addition, members of this group had experienced extremely elevated levels of childhood adversity. Nearly half had left home early, 43 per cent had left school early, and more than one-third had experienced their parents' separation or divorce. This group is tentatively named 'Disadvantaged Australians'.

### 5.3 Interim summary

The descriptions of the content of the clusters presented above are based on the results of analyses of the primary variables on which the clustering was performed. These descriptions appear informative and intuitively appealing. But evaluation of the adequacy of the cluster solution would be premature at this point, given that the cluster descriptions can be enhanced by the use of secondary variables, whose role is exclusively descriptive.

Differences between clusters based on the distributions of variables **not** used in the cluster analysis are particularly informative in evaluating the validity of the cluster solution (Beitchman et al. 2001; Stewart & Trupin 2003) and in enriching the cluster profiles. These will therefore be presented prior to summarising cluster characteristics and evaluating the meaningfulness and scientific usefulness of this cluster solution.

## 5.4 Five clusters in terms of secondary variables

One-way analyses of variance (ANOVAs) were used to test for main effects for continuous secondary variables. Mean scores for all variables other than mean number of paid jobs differed significantly between at least two of the clusters (Table 8). As the table shows, except for the mean number of paid jobs (*n.s.*) and mean amount spent on tobacco per week ( $p=0.004$ ), all models were highly significant at  $p<0.0001$ . This means that the differences between groups were extremely unlikely to be due to chance, or to error in the data or the analyses. Table 9 presents the results of chi-squared analyses used to assess significant differences in distributions of categorical variables across clusters. All models were significant at  $p<0.0001$ , indicating that the distribution of characteristics for all secondary categorical variables deviated significantly from expected values across the five clusters.

With all but one of the continuous variables and all of the categorical variables differing among clusters, it was appropriate to conduct more detailed analyses to investigate these characteristics within each cluster. The distributions of secondary variables across the five clusters are presented in Table 10 (continuous variables) and Table 11 (categorical variables). For the analyses of variance, sample numbers for each cluster are given in the second column. With large amounts of missing data for some variables, estimates for cell sizes of less than 100 are not reported. For the chi-squared analyses, even distributions of characteristics within groups were not assumed; the observed count for each variable was contrasted with the expected count for that variable based on proportional distributions for the sample as a whole. Adjusted standardised residuals are presented, rather than unstandardised and/or unadjusted residuals, to allow for the accurate assessment of significant deviance from expected values (indicated by adjusted standardised residual values of around three or higher). The following descriptions are a summary of the key points that can be drawn from Tables 10 and 11.

**Table 8: One-way analyses of variance showing main effects for continuous secondary variables**

| Source of variation                  | Sums of squares | df    | Variance estimate | F-ratio  | p      |
|--------------------------------------|-----------------|-------|-------------------|----------|--------|
| <b>Age in years</b>                  |                 |       |                   |          |        |
| Between groups                       | 1,069,284.64    | 4     | 267,321.16        | 2,395.59 | 0.0001 |
| Within groups                        | 670,201.67      | 6,006 | 111.59            |          |        |
| Total                                | 1,739,486.30    | 6,010 |                   |          |        |
| <b>Years married</b>                 |                 |       |                   |          |        |
| Between groups                       | 392,517.68      | 4     | 98,129.42         | 777.09   | 0.0001 |
| Within groups                        | 410,277.50      | 3,249 | 126.28            |          |        |
| Total                                | 802,795.19      | 3,253 |                   |          |        |
| <b>Years de facto</b>                |                 |       |                   |          |        |
| Between groups                       | 833.25          | 4     | 208.31            | 7.65     | 0.0001 |
| Within groups                        | 16,545.98       | 608   | 27.21             |          |        |
| Total                                | 17,379.23       | 612   |                   |          |        |
| <b>Current partner satisfaction</b>  |                 |       |                   |          |        |
| Between groups                       | 1,703.50        | 4     | 425.87            | 96.70    | 0.0001 |
| Within groups                        | 18,973.58       | 4,308 | 4.40              |          |        |
| Total                                | 20,677.08       | 4,312 |                   |          |        |
| <b>Former partner satisfaction</b>   |                 |       |                   |          |        |
| Between groups                       | 2,012.96        | 4     | 503.24            | 42.03    | 0.0001 |
| Within groups                        | 24,448.28       | 2,042 | 11.97             |          |        |
| Total                                | 26,461.23       | 2,046 |                   |          |        |
| <b>Number of paid jobs</b>           |                 |       |                   |          |        |
| Between groups                       | 0.67            | 4     | 0.17              | 1.25     | 0.289  |
| Within groups                        | 437.64          | 3,282 | 0.13              |          |        |
| Total                                | 438.30          | 3,286 |                   |          |        |
| <b>Years unemployed</b>              |                 |       |                   |          |        |
| Between groups                       | 1,046.61        | 4     | 261.65            | 93.47    | 0.0001 |
| Within groups                        | 16,662.09       | 5,952 | 2.80              |          |        |
| Total                                | 17,708.70       | 5,956 |                   |          |        |
| <b>Job satisfaction</b>              |                 |       |                   |          |        |
| Between groups                       | 41,570.68       | 4     | 10,392.67         | 1,113.32 | 0.0001 |
| Within groups                        | 55,346.16       | 5,929 | 9.33              |          |        |
| Total                                | 96,916.84       | 5,933 |                   |          |        |
| <b>Number of financial hardships</b> |                 |       |                   |          |        |
| Between groups                       | 1,779.84        | 4     | 444.96            | 322.48   | 0.0001 |
| Within groups                        | 8,016.80        | 5,810 | 1.38              |          |        |
| Total                                | 9,796.64        | 5,814 |                   |          |        |
| <b>Satisfaction with finances</b>    |                 |       |                   |          |        |
| Between groups                       | 5,460.10        | 4     | 1,365.03          | 252.61   | 0.0001 |
| Within groups                        | 32,455.13       | 6,006 | 5.40              |          |        |
| Total                                | 37,915.23       | 6,010 |                   |          |        |

**Table 8: One-way analyses of variance showing main effects for continuous secondary variables (continued)**

| Source of variation                    | Sums of squares | df    | Variance estimate | F-ratio | p      |
|--|-----------------|-------|-------------------|---------|--------|
| <b>Life satisfaction</b>               |                 |       |                   |         |        |
| Between groups                         | 935.97          | 4     | 233.99            | 142.58  | 0.0001 |
| Within groups                          | 7,885.43        | 4,805 | 1.64              |         |        |
| Total                                  | 8,821.40        | 4,809 |                   |         |        |
| <b>General health</b>                  |                 |       |                   |         |        |
| Between groups                         | 229,324.29      | 4     | 57,331.07         | 137.48  | 0.0001 |
| Within groups                          | 2,461,271.97    | 5,902 | 417.02            |         |        |
| Total                                  | 2,690,596.26    | 5,906 |                   |         |        |
| <b>Self-rated health</b>               |                 |       |                   |         |        |
| Between groups                         | 728.63          | 4     | 182.16            | 202.35  | 0.0001 |
| Within groups                          | 5,374.38        | 5,970 | 0.90              |         |        |
| Total                                  | 6,103.01        | 5,974 |                   |         |        |
| <b>Satisfaction with health</b>        |                 |       |                   |         |        |
| Between groups                         | 1,768.07        | 4     | 442.02            | 101.91  | 0.0001 |
| Within groups                          | 26,041.13       | 6,004 | 4.34              |         |        |
| Total                                  | 27,809.20       | 6,008 |                   |         |        |
| <b>Social support</b>                  |                 |       |                   |         |        |
| Between groups                         | 204.51          | 4     | 51.13             | 51.74   | 0.0001 |
| Within groups                          | 5,864.15        | 5,934 | 0.99              |         |        |
| Total                                  | 6,068.66        | 5,938 |                   |         |        |
| <b>\$/week on tobacco</b>              |                 |       |                   |         |        |
| Between groups                         | 7,400.28        | 4     | 1,850.07          | 3.81    | 0.004  |
| Within groups                          | 707,889.03      | 1,459 | 485.19            |         |        |
| Total                                  | 715,289.30      | 1,463 |                   |         |        |
| <b>\$ spent on tobacco as % income</b> |                 |       |                   |         |        |
| Between groups                         | 18,593.11       | 4     | 4,648.28          | 29.79   | 0.0001 |
| Within groups                          | 227,669.25      | 1,459 | 156.04            |         |        |
| Total                                  | 246,262.36      | 1,463 |                   |         |        |

**Table 9: Summary of chi-squared models for secondary categorical variables for five major groupings of Australians**

| Variable                        | Pearson $\chi^2$ | df | p      |
|---------------------------------|------------------|----|--------|
| Alcohol consumption             | 556.33           | 16 | 0.0001 |
| Father's unemployment           | 40.52            | 4  | 0.0001 |
| Generation                      | 5,231.47         | 16 | 0.0001 |
| Housing tenure                  | 1,289.38         | 12 | 0.0001 |
| Participates in sport etc clubs | 69.09            | 4  | 0.0001 |
| Repayment of credit card        | 179.64           | 8  | 0.0001 |
| Sees friends & relatives        | 162.90           | 8  | 0.0001 |
| Tobacco smoking                 | 554.59           | 16 | 0.0001 |

Table 10: Mean scores and standard deviations for continuous secondary variables

|   | Total N | Retirees |                | Working Age Couples |                | Couples With Children |                | Working Age Singles |                | Disadvantaged Australians |                |
|---|---------|----------|----------------|---------------------|----------------|-----------------------|----------------|---------------------|----------------|---------------------------|----------------|
|   |         | M        | S <sub>x</sub> | M                   | S <sub>x</sub> | M                     | S <sub>x</sub> | M                   | S <sub>x</sub> | M                         | S <sub>x</sub> |
| <b>Age in years</b>                           | 6,011   | 69.95    | 8.48           | 44.52               | 13.48          | 38.56                 | 6.90           | 33.14               | 12.70          | 37.94                     | 10.97          |
| <b>Adult relationships</b>                    |         |          |                |                     |                |                       |                |                     |                |                           |                |
| Years married                                 | 3,254   | 40.36*   | 13.12          | 20.97               | 14.28          | 12.98#                | 7.33           | -                   | -              | 14.11                     | 10.01          |
| Years de facto                                | 613     | -        | -              | 4.50#               | 5.05           | 6.14*                 | 5.50           | -                   | -              | -                         | -              |
| Current partner satisfaction                  | 4,313   | 9.01*    | 1.99           | 8.88*               | 1.65           | 8.42                  | 1.89           | 7.10#               | 2.99           | 7.22#                     | 3.20           |
| Former partner satisfaction                   | 2,047   | 7.61*    | 3.32           | 6.32                | 3.38           | 6.17                  | 3.50           | 5.13                | 3.47           | 4.65#                     | 3.58           |
| <b>Economic &amp; financial circumstances</b> |         |          |                |                     |                |                       |                |                     |                |                           |                |
| Number of paid jobs (all <i>n.s.</i> )        | 3,287   | -        | -              | 1.07                | 0.26           | 1.10                  | 0.30           | 1.11                | 0.31           | 1.12                      | 0.32           |
| Years unemployed                              | 5,957   | n/a      | 1.56           | 0.24#               | 0.93           | 0.37                  | 1.28           | 0.45                | 1.35           | 1.55*                     | 3.17           |
| Job satisfaction                              | 5,934   | n/a      | n/a            | 6.73*               | 3.17           | 6.42*                 | 3.36           | 6.37*               | 3.14           | 1.92#                     | 3.54           |
| Number of financial hardships                 | 5,815   | 0.25#    | 0.76           | 0.35                | 0.90           | 0.50                  | 1.03           | 0.83                | 1.36           | 2.03                      | 1.89           |
| Satisfaction with finances                    | 6,011   | 6.76*    | 2.39           | 6.84*               | 2.16           | 6.33                  | 2.12           | 5.80                | 2.51           | 3.83#                     | 2.56           |
| <b>Health &amp; wellbeing</b>                 |         |          |                |                     |                |                       |                |                     |                |                           |                |
| Life satisfaction                             | 6,003   | 8.47*    | 1.65           | 8.25                | 1.37           | 8.05                  | 1.41           | 7.62                | 1.62           | 7.00#                     | 2.10           |
| Feeling rushed, pressed for time              | 5,990   | 3.34*    | 0.92           | 2.70                | 0.87           | 2.42#                 | 0.87           | 2.67                | 0.93           | 2.64                      | 0.99           |
| Too much spare time                           | 5,994   | 3.78     | 0.97           | 4.01*               | 0.81           | 4.08*                 | 0.77           | 3.69                | 0.93           | 3.52#                     | 1.05           |
| General health                                | 5,907   | 60.65#   | 23.18          | 73.66*              | 18.89          | 75.24*                | 17.87          | 73.15*              | 18.93          | 61.83#                    | 24.50          |
| Self-rated health                             | 5,975   | 3.08*    | 1.02           | 2.33#               | 0.91           | 2.26#                 | 0.86           | 2.28#               | 0.91           | 2.90                      | 1.11           |
| Satisfaction with health                      | 6,009   | 6.90     | 2.4            | 7.77*               | 1.79           | 7.80*                 | 1.72           | 7.67*               | 1.87           | 6.30#                     | 2.78           |
| <b>Social participation</b>                   |         |          |                |                     |                |                       |                |                     |                |                           |                |
| Social support                                | 5,957   | 5.34     | 1.03           | 5.59*               | 0.89           | 5.43                  | 0.95           | 5.32                | 1.03           | 4.96#                     | 1.11           |
| <b>Substance use</b>                          |         |          |                |                     |                |                       |                |                     |                |                           |                |
| \$/week spent on tobacco                      | 1,464   | 31.71#   | 17.28          | 40.37*              | 22.39          | 35.75                 | 22.21          | 36.86               | 24.14          | 35.95                     | 21.09          |
| \$/week on tobacco as % income                | 1,464   | 13.06*   | 19.97          | 5.36#               | 9.08           | 6.77#                 | 7.45           | 5.96#               | 11.47          | 13.53*                    | 14.93          |

\*, # Scores are significantly higher (\*) or lower (#) than those of all other clusters at *p*<0.01.

n/a 'not applicable'

- cluster N<100.

Note: cluster Ns<100 not reported.

Table 11: Obtained compared with whole of sample expected values for secondary categorical variables

| Variables (and total cluster Ns)              | Within cluster % | Observed | Expected | Adjusted standardised residual | Pearson $\chi^2$ | df | p      |
|---|------------------|----------|----------|--------------------------------|------------------|----|--------|
| <b>Retirees</b>                               |                  |          |          |                                |                  |    |        |
| <i>Generation (N=1,292)</i>                   |                  |          |          |                                |                  |    |        |
| Net Generation (15–24)                        | 0.0              | 0        | 128      | -13.4                          | 1,298.98         | 4  | 0.0001 |
| Generation X (25–39)                          | 0.0              | 0        | 429      | -28.6                          |                  |    |        |
| Baby Boomers (40–59)                          | 11.5             | 149      | 444      | -19.5                          |                  |    |        |
| Long Civic Generation (60–79)                 | 74.8             | 966      | 254      | 56.3                           |                  |    |        |
| Elders (80+)                                  | 13.7             | 177      | 38       | 25.8                           |                  |    |        |
| <i>Economic &amp; financial circumstances</i> |                  |          |          |                                |                  |    |        |
| <i>Housing tenure (N=659)</i>                 |                  |          |          |                                |                  |    |        |
| Owns home outright                            | 58.6             | 386      | 160      | 22.1                           | 515.29           | 3  | 0.0001 |
| Buying home                                   | 7.9              | 52       | 257      | -17.6                          |                  |    |        |
| Renting                                       | 27.0             | 178      | 222      | -3.9                           |                  |    |        |
| Other   | 6.5              | 43       | 21       | 5.4                            |                  |    |        |
| <i>Repays credit card (N=565)</i>             |                  |          |          |                                |                  |    |        |
| Rarely  | 6.5              | 37       | 91       | -6.8                           | 76.17            | 2  | 0.0001 |
| Sometimes                                     | 6.7              | 38       | 79       | -5.5                           |                  |    |        |
| Usually                                       | 86.7             | 490      | 395      | 9.6                            |                  |    |        |
| <i>Health &amp; wellbeing</i>                 |                  |          |          |                                |                  |    |        |
| <i>Alcohol consumption (N=1,276)</i>          |                  |          |          |                                |                  |    |        |
| Has never consumed alcohol                    | 14.9             | 190      | 105      | 9.7                            | 102.57           | 3  | 0.0001 |
| Very rarely, or no longer, consumes alcohol   | 36.4             | 465      | 413      | 3.5                            |                  |    |        |
| Consumes alcohol at low risk levels           | 42.6             | 544      | 680      | -8.6                           |                  |    |        |
| Consumes alcohol at risky levels              | 6.0              | 77       | 78       | -0.2                           |                  |    |        |
| <i>Tobacco smoking intensity (N=1,269)</i>    |                  |          |          |                                |                  |    |        |
| Never smoked                                  | 49.8             | 632      | 604      | 1.8                            | 165.96           | 4  | 0.0001 |
| Used to smoke                                 | 39.2             | 498      | 350      | 10.4                           |                  |    |        |
| Light smoking (<10 a day)                     | 5.0              | 64       | 123      | -6.3                           |                  |    |        |
| Medium smoking (10–20 a day)                  | 4.9              | 62       | 127      | -7.0                           |                  |    |        |
| Heavy smoking (>20 a day)                     | 1.0              | 13       | 64       | -7.3                           |                  |    |        |

Table 11: Obtained compared with whole of sample expected values for secondary categorical variables (continued)

| Variables (and total cluster Ns)                 | Within cluster % | Observed | Expected | Adjusted standardised residual | Pearson $\chi^2$ | df | p      |
|--|------------------|----------|----------|--------------------------------|------------------|----|--------|
| <b>Retirees (continued)</b>                      |                  |          |          |                                |                  |    |        |
| <i>Pseudomaturity and early adversity</i>        |                  |          |          |                                |                  |    |        |
| Father unemployed when R was 14 (N=1,177)        | 15.4             | 181      | 143      | 3.8                            | 11.49            | 1  | 0.001  |
| <i>Social participation</i>                      |                  |          |          |                                |                  |    |        |
| Is active member of sporting etc group (N=1,280) | 46.7             | 598      | 508      | 5.8                            | 26.44            | 1  | 0.0001 |
| Sees friends and relatives (N=1,282)             |                  |          |          |                                |                  |    |        |
| Rarely   | 10.7             | 137      | 131      | 0.6                            | 0.79             | 2  | 0.63   |
| Sometimes  | 26.8             | 343      | 334      | 0.7                            |                  |    |        |
| Often  | 62.6             | 802      | 817      | -0.1                           |                  |    |        |
| <b>Working Age Couples</b>                       |                  |          |          |                                |                  |    |        |
| <i>Generation (N=1,228)</i>                      |                  |          |          |                                |                  |    |        |
| Net Generation (15-24)                           | 7.1              | 87       | 121      | -3.7                           | 131.12           | 4  | 0.0001 |
| Generation X (25-39)                             | 30.9             | 379      | 408      | -2.0                           |                  |    |        |
| Baby Boomers (40-59)                             | 48.7             | 598      | 422      | 11.9                           |                  |    |        |
| Long Civic Generation (60-79)                    | 13.4             | 164      | 241      | -6.2                           |                  |    |        |
| Elders (80+)                                     | 0.0              | 0        | 36       | -6.8                           |                  |    |        |
| <i>Economic &amp; financial circumstances</i>    |                  |          |          |                                |                  |    |        |
| Housing tenure (N=1,032)                         |                  |          |          |                                |                  |    |        |
| Owns home outright                               | 27.3             | 282      | 251      | 2.5                            | 25.82            | 3  | 0.0001 |
| Buying home                                      | 43.5             | 449      | 402      | 3.4                            |                  |    |        |
| Renting  | 26.4             | 272      | 347      | -5.6                           |                  |    |        |
| Other  | 2.8              | 29       | 32       | -0.6                           |                  |    |        |
| Repays credit card (N=875)                       |                  |          |          |                                |                  |    |        |
| Rarely   | 13.1             | 115      | 141      | -2.8                           | 7.84             | 2  | 0.02   |
| Sometimes  | 12.8             | 112      | 122      | -1.2                           |                  |    |        |
| Usually  | 74.1             | 648      | 611      | 3.1                            |                  |    |        |

Table 11: Obtained compared with whole of sample expected values for secondary categorical variables (continued)

| Variables (and total cluster Ns)                 | Within cluster % | Observed | Expected | Adjusted standardised residual | Pearson $\chi^2$ | df | p      |
|--|------------------|----------|----------|--------------------------------|------------------|----|--------|
| <b>Working Age Couples (continued)</b>           |                  |          |          |                                |                  |    |        |
| <i>Health &amp; wellbeing</i>                    |                  |          |          |                                |                  |    |        |
| Alcohol consumption (N=1,225)                    |                  |          |          |                                |                  |    |        |
| Has never consumed alcohol                       | 5.2              | 64       | 101      | -4.3                           | 56.67            | 3  | 0.0001 |
| Very rarely, or no longer consumes alcohol       | 25.1             | 308      | 396      | -6.0                           |                  |    |        |
| Consumes alcohol at low risk levels              | 63.4             | 777      | 653      | 8.0                            |                  |    |        |
| Consumes alcohol at risky levels                 | 6.2              | 76       | 75       | 0.1                            |                  |    |        |
| Tobacco smoking intensity (N=1,223)              |                  |          |          |                                |                  |    |        |
| Never smoked                                     | 51.0             | 624      | 582      | 2.7                            | 15.24            | 4  | 0.004  |
| Used to smoke                                    | 27.1             | 332      | 338      | -0.4                           |                  |    |        |
| Light smoking (<10 a day)                        | 6.9              | 84       | 118      | -3.7                           |                  |    |        |
| Medium smoking (10-20 a day)                     | 9.2              | 113      | 124      | -1.2                           |                  |    |        |
| Heavy smoking (>20 a day)                        | 5.7              | 70       | 61       | 1.3                            |                  |    |        |
| <i>Pseudomaturity and early adversity</i>        |                  |          |          |                                |                  |    |        |
| Father unemployed when R was 14 (N=1,173)        | 10.0             | 119      | 143      | -2.4                           | 4.59             | 1  | 0.03   |
| <i>Social participation</i>                      |                  |          |          |                                |                  |    |        |
| Is active member of sporting etc group (N=1,226) | 40.3             | 494      | 486      | 0.5                            | 0.22             | 1  | 0.64   |
| Sees friends and relatives (N=1,223)             |                  |          |          |                                |                  |    |        |
| Rarely   | 9.6              | 118      | 125      | -0.7                           | 8.32             | 2  | 0.02   |
| Sometimes  | 29.7             | 363      | 319      | 3.3                            |                  |    |        |
| Often  | 60.7             | 742      | 780      | -2.5                           |                  |    |        |
| <b>Couples with Children</b>                     |                  |          |          |                                |                  |    |        |
| <i>Generation (N=1,150)</i>                      |                  |          |          |                                |                  |    |        |
| Net Generation (15-24)                           | 1.2              | 19       | 153      | -13.2                          | 336.42           | 4  | 0.0001 |
| Generation X (25-39)                             | 55.5             | 861      | 515      | 21.7                           |                  |    |        |
| Baby Boomers (40-59)                             | 43.2             | 670      | 532      | 8.6                            |                  |    |        |
| Long Civic Generation (60-79)                    | 0.0              | 0        | 305      | -22.6                          |                  |    |        |
| Elders (80+)                                     | 0.0              | 0        | 46       | -8.0                           |                  |    |        |

Table 11: Obtained compared with whole of sample expected values for secondary categorical variables (continued)

| Variables (and total cluster Ns)                 | Within cluster % | Observed | Expected | Adjusted standardised residual | Pearson $\chi^2$ | df | p      |
|--|------------------|----------|----------|--------------------------------|------------------|----|--------|
| <b>Couples with Children (continued)</b>         |                  |          |          |                                |                  |    |        |
| <i>Economic &amp; financial circumstances</i>    |                  |          |          |                                |                  |    |        |
| Housing tenure (N=1,405)                         |                  |          |          |                                |                  |    |        |
| Owns home outright                               | 17.7             | 248      | 342      | -6.9                           | 361.52           | 3  | 0.0001 |
| Buying home                                      | 63.3             | 890      | 547      | 22.3                           |                  |    |        |
| Renting  | 17.1             | 240      | 472      | -15.6                          |                  |    |        |
| Other  | 1.9              | 27       | 44       | -3.0                           |                  |    |        |
| Repays credit card (N=1,081)                     |                  |          |          |                                |                  |    |        |
| Rarely   | 16.2             | 175      | 175      | 0.0                            | 9.19             | 2  | 0.0001 |
| Sometimes  | 17.1             | 185      | 151      | 3.6                            |                  |    |        |
| Usually  | 66.7             | 721      | 755      | -2.8                           |                  |    |        |
| <i>Health &amp; wellbeing</i>                    |                  |          |          |                                |                  |    |        |
| <b>Alcohol consumption (N=1,550)</b>             |                  |          |          |                                |                  |    |        |
| Has never consumed alcohol                       | 5.9              | 92       | 128      | -3.8                           | 22.44            | 3  | 0.0001 |
| Very rarely, or no longer consumes alcohol       | 30.5             | 472      | 501      | -1.8                           |                  |    |        |
| Consumes alcohol at low risk levels              | 58.5             | 907      | 826      | 4.8                            |                  |    |        |
| Consumes alcohol at risky levels                 | 5.1              | 79       | 95       | -2.0                           |                  |    |        |
| <b>Tobacco smoking intensity (N=1,145)</b>       |                  |          |          |                                |                  |    |        |
| Never smoked                                     | 51.3             | 792      | 735      | 3.4                            | 17.01            | 4  | 0.002  |
| Used to smoke                                    | 28.2             | 435      | 427      | 0.6                            |                  |    |        |
| Light smoking (<10 a day)                        | 8.5              | 132      | 149      | -1.7                           |                  |    |        |
| Medium smoking (10–20 a day)                     | 7.7              | 119      | 157      | -3.7                           |                  |    |        |
| Heavy smoking (>20 a day)                        | 4.3              | 67       | 77       | -1.4                           |                  |    |        |
| <i>Pseudomaturity and early adversity</i>        |                  |          |          |                                |                  |    |        |
| Father unemployed when R was 14 (N=1,489)        | 10.9             | 162      | 181      | -1.8                           | 2.27             | 1  | 0.13   |
| <i>Social participation</i>                      |                  |          |          |                                |                  |    |        |
| Is active member of sporting etc group (N=1,145) | 37.4             | 578      | 613      | -2.1                           | 3.31             | 1  | 0.07   |

Table 11: Obtained compared with whole of sample expected values for secondary categorical variables (continued)

| Variables (and total cluster Ns)                | Within cluster % | Observed | Expected | Adjusted standardised residual | Pearson $\chi^2$ | df | p      |
|---|------------------|----------|----------|--------------------------------|------------------|----|--------|
| <b>Couples with Children (continued)</b>        |                  |          |          |                                |                  |    |        |
| Sees friends and relatives (N=1,546)            |                  |          |          |                                |                  |    |        |
| Rarely  | 11.4             | 177      | 158      | 1.9                            | 40.01            | 2  | 0.0001 |
| Sometimes                                       | 32.4             | 501      | 403      | 6.6                            |                  |    |        |
| Often   | 56.1             | 868      | 985      | -7.2                           |                  |    |        |
| <b>Working Age Singles Generation (N=1,153)</b> |                  |          |          |                                |                  |    |        |
| Net Generation (15-24)                          | 34.2             | 394      | 114      | 30.8                           | 905.92           | 4  | 0.0001 |
| Generation X (25-39)                            | 34.9             | 402      | 383      | 1.3                            |                  |    |        |
| Baby Boomers (40-59)                            | 28.4             | 327      | 396      | -4.8                           |                  |    |        |
| Long Civic Generation (60-79)                   | 2.6              | 30       | 227      | -16.2                          |                  |    |        |
| Elders (80+)                                    | 0.0              | 0        | 34       | -6.6                           |                  |    |        |
| <b>Economic &amp; financial circumstances</b>   |                  |          |          |                                |                  |    |        |
| Housing tenure (N=1,010)                        |                  |          |          |                                |                  |    |        |
| Owens home outright                             | 19.3             | 195      | 246      | -4.2                           | 76.85            | 3  | 0.0001 |
| Buying home                                     | 31.3             | 316      | 394      | -5.6                           |                  |    |        |
| Renting   | 46.6             | 471      | 340      | 9.8                            |                  |    |        |
| Other   | 2.8              | 28       | 31       | -0.7                           |                  |    |        |
| Repays credit card (N=589)                      |                  |          |          |                                |                  |    |        |
| Rarely  | 23.1             | 136      | 95       | 5.0                            | 23.50            | 2  | 0.0001 |
| Sometimes                                       | 14.9             | 88       | 82       | 0.7                            |                  |    |        |
| Usually   | 62.0             | 365      | 412      | -4.6                           |                  |    |        |
| <b>Health &amp; wellbeing</b>                   |                  |          |          |                                |                  |    |        |
| Alcohol consumption (N=1,153)                   |                  |          |          |                                |                  |    |        |
| Has never consumed alcohol                      | 6.3              | 73       | 95       | -2.6                           | 23.63            | 3  | 0.0001 |
| Very rarely, or no longer, consumes alcohol     | 27.3             | 315      | 373      | -4.1                           |                  |    |        |
| Consumes alcohol at low risk levels             | 59.8             | 689      | 614      | 4.9                            |                  |    |        |
| Consumes alcohol at risky levels                | 6.6              | 76       | 71       | 0.7                            |                  |    |        |

Table 11: Obtained compared with whole of sample expected values for secondary categorical variables (continued)

| Variables (and total cluster Ns)                 | Within cluster % | Observed | Expected | Adjusted standardised residual | Pearson $\chi^2$ | df | p      |
|--|------------------|----------|----------|--------------------------------|------------------|----|--------|
| <b>Working Age Singles (continued)</b>           |                  |          |          |                                |                  |    |        |
| Tobacco smoking intensity (N=1,151)              |                  |          |          |                                |                  |    |        |
| Never smoked                                     | 49.8             | 573      | 548      | 1.7                            | 55.18            | 4  | 0.0001 |
| Used to smoke                                    | 19.1             | 220      | 318      | -7.2                           |                  |    |        |
| Light smoking (<10 a day)                        | 12.9             | 149      | 111      | 4.2                            |                  |    |        |
| Medium smoking (10-20 a day)                     | 11.0             | 127      | 117      | 1.1                            |                  |    |        |
| Heavy smoking (>20 a day)                        | 7.1              | 82       | 58       | 3.7                            |                  |    |        |
| <i>Pseudomaturity and early adversity</i>        |                  |          |          |                                |                  |    |        |
| Father unemployed when R was 14 (N=1,016)        | 9.4              | 95       | 124      | -3.0                           | 7.73             | 1  | 0.005  |
| <i>Social participation</i>                      |                  |          |          |                                |                  |    |        |
| Is active member of sporting etc group (N=1,150) | 41.4             | 476      | 456      | 1.3                            | 1.45             | 1  | 0.23   |
| Sees friends and relatives (N=1,150)             |                  |          |          |                                |                  |    |        |
| Rarely   | 6.2              | 71       | 118      | -5.0                           | 95.86            | 2  | 0.0001 |
| Sometimes  | 16.3             | 187      | 300      | -8.4                           |                  |    |        |
| Often  | 77.6             | 892      | 733      | 10.9                           |                  |    |        |
| <b>Disadvantaged Australians</b>                 |                  |          |          |                                |                  |    |        |
| <i>Generation (N=788)</i>                        |                  |          |          |                                |                  |    |        |
| Net Generation (15-24)                           | 11.8             | 93       | 78       | 2.0                            | 182.76           | 4  | 0.0001 |
| Generation X (25-39)                             | 44.9             | 354      | 262      | 7.5                            |                  |    |        |
| Baby Boomers (40-59)                             | 40.6             | 320      | 271      | 4.0                            |                  |    |        |
| Long Civic Generation (60-79)                    | 2.7              | 21       | 155      | -12.9                          |                  |    |        |
| Elders (80+)                                     | 0.0              | 0        | 23       | -5.2                           |                  |    |        |
| <i>Economic &amp; financial circumstances</i>    |                  |          |          |                                |                  |    |        |
| <i>Housing tenure (N=722)</i>                    |                  |          |          |                                |                  |    |        |
| Owns home outright                               | 8.7              | 63       | 176      | -10.6                          | 310.71           | 3  | 0.0001 |
| Buying home                                      | 24.1             | 174      | 281      | -8.9                           |                  |    |        |
| Renting  | 64.0             | 462      | 243      | 18.7                           |                  |    |        |
| Other  | 3.2              | 23       | 22       | 0.1                            |                  |    |        |

Table 11: Obtained compared with whole of sample expected values for secondary categorical variables (continued)

| Variables (and total cluster Ns)               | Within cluster % | Observed | Expected | Adjusted standardised residual | Pearson $\chi^2$ | df | p      |
|--|------------------|----------|----------|--------------------------------|------------------|----|--------|
| <b>Disadvantaged Australians (continued)</b>   |                  |          |          |                                |                  |    |        |
| Repays credit card (N=228)                     |                  |          |          |                                |                  |    |        |
| Rarely   | 33.3             | 76       | 37       | 7.3                            | 61.97            | 2  | 0.0001 |
| Sometimes                                      | 19.3             | 44       | 32       | 2.4                            |                  |    |        |
| Usually  | 47.4             | 108      | 159      | -7.7                           |                  |    |        |
| <i>Health &amp; wellbeing</i>                  |                  |          |          |                                |                  |    |        |
| Alcohol consumption (N=783)                    |                  |          |          |                                |                  |    |        |
| Has never consumed alcohol                     | 9.6              | 75       | 65       | 1.4                            | 113.58           | 3  | 0.0001 |
| Very rarely, or no longer, consumes alcohol    | 48.0             | 376      | 253      | 10.1                           |                  |    |        |
| Consumes alcohol at low risk levels            | 34.9             | 273      | 417      | -11.1                          |                  |    |        |
| Consumes alcohol at risky levels               | 7.5              | 59       | 48       | 1.8                            |                  |    |        |
| <i>Tobacco smoking intensity (N=784)</i>       |                  |          |          |                                |                  |    |        |
| Never smoked                                   | 28.2             | 221      | 373      | -11.7                          | 298.32           | 4  | 0.0001 |
| Used to smoke                                  | 20.9             | 164      | 217      | -4.5                           |                  |    |        |
| Light smoking (<10 a day)                      | 18.9             | 148      | 76       | 9.4                            |                  |    |        |
| Medium smoking (10–20 a day)                   | 23.5             | 184      | 79       | 13.3                           |                  |    |        |
| Heavy smoking (>20 a day)                      | 8.5              | 67       | 39       | 4.9                            |                  |    |        |
| <i>Pseudomaturity and early adversity</i>      |                  |          |          |                                |                  |    |        |
| Father unemployed when R was 14 (N=697)        | 16.9             | 118      | 85       | 4.1                            | 208.18           | 1  | 0.0001 |
| <i>Social participation</i>                    |                  |          |          |                                |                  |    |        |
| Is active member of sporting etc group (N=781) | 28.9             | 226      | 310      | -6.6                           | 37.74            | 1  | 0.0001 |
| Sees friends and relatives (N=778)             |                  |          |          |                                |                  |    |        |
| Rarely   | 13.9             | 108      | 80       | 3.6                            | 17.95            | 2  | 0.0001 |
| Sometimes                                      | 21.0             | 163      | 203      | -3.5                           |                  |    |        |
| Often  | 65.2             | 507      | 496      | 0.9                            |                  |    |        |

### **Cluster 1: Retirees**

With a mean age of 70 years, Retirees were more than 25 years older on average than the next oldest group. With the exception of 149 Baby Boomers, all members of this cluster were members of the Long Civic Generation, or Elders. Reflecting this age profile, they had been married on average some 20 years longer than the next longest-married group. With a mean of 9.01 out of a possible score of 10, they reported extremely high levels of satisfaction with their partners, the highest of any group. In addition, those that had former partners reported higher levels of satisfaction with their relationship with that person than did any other group.

Despite this being a low-income group, Retirees reported experiencing the least financial hardship of any group and the greatest satisfaction with their financial circumstances. This perhaps reflects their extremely high rates of home ownership (nearly 60 per cent owned their homes outright). With 87 per cent discharging their credit card balance every month, their satisfaction with their financial circumstances might also reflect control over their expenditure. Finally, again consistent with their age profile (they were born and grew up during the Great Depression and the Second World War), 15 per cent of Retirees (more than would be expected by chance) experienced their fathers' unemployment when they were 14 years old.

Health and wellbeing was a mixed experience for this group. On the one hand, consistent with their satisfaction with their partners and with their financial circumstances, they had the highest level of general life satisfaction of any group. They experienced the lowest levels of feeling rushed or pressed for time, yet did not report having too much spare time. Compared to other groups, they were the least likely to be current smokers and the most likely to have given up smoking. They tended to be non-drinkers. A greater proportion reported having never consumed alcohol, having consumed rarely, or having given up. On the other hand, as would be expected given their age, they had numerous physical health problems, with the poorest general health and worst self-rated health of any group. Not surprisingly, they also reported relatively low levels of satisfaction with their health, though not as low as those reported by Disadvantaged Australians.

While Retirees were no more or less likely than other groups to see friends or extended family, and reported only average levels of social support, they were more likely than other groups to be active members of sporting, hobby or community-based associations, with almost half currently involved in such an association. Given their many positive experiences and, despite numerous health concerns, very high levels of satisfaction with many spheres of life, this group is renamed 'Connected Retirees'.

### **Cluster 2: Working Age Couples**

With a mean age of 44 years in 2001, when these data were collected, Baby Boomers were heavily overrepresented among Working Age Couples. There were no Elders in this group, and only 13 per cent of Working Age Couples belonged to the Long Civic Generation. They had been married for more than 20 years on average, the second longest of any group, but had the shortest-lived de facto relationships. Their lengthy marriages, for their age, perhaps reflect the very high levels of satisfaction that they reported with their partners.

With the shortest duration of unemployment of any working-age group, equal highest levels of job satisfaction, and equal highest satisfaction with their financial circumstances, this appeared to be an economically secure group. Higher than would be expected by chance levels of home ownership or home buying, and of full monthly repayment of credit card bills, appeared to confirm this comfortable economic status. While they spent more than any other group each week on tobacco, this represented the lowest proportion of their equivalised disposable income of any group (and similar to that of Couples with Children and Working Age Singles). This relative prosperity was perhaps associated to some degree with their somewhat more favourable than average early economic environments: only one in 10 members of the Working Age Couples group experienced their father's unemployment when they were 14 years old.

Working Age Couples reported high levels of general life satisfaction, very good general and self-rated health, and high levels of satisfaction with their health. They were slightly more likely than would be expected to have never smoked or, if they did smoke, to be light smokers. While they were less likely to be non-drinkers, a greater proportion than in other groups was low-risk drinkers. They reported average levels of feeling rushed or pressed

for time, and also the lowest levels of having too much spare time. In terms of social participation, they were no more or less likely than any other group to be an active member of a sporting, hobby or community-based association, but they were slightly more likely to see friends or extended family only 'sometimes', rather than often. In view of their economic circumstances, this group is renamed 'Financially Secure Working Couples'.

### **Cluster 3: Couples with Children**

At 39 years old, Couples with Children were on average a little younger than the Financially Secure Working Couples. Generation Xers were very heavily overrepresented in this group, and Baby Boomers were somewhat so. There were no members of the Long Civic Generation, nor any Elders, in this group, and very few members of the Net Generation.

Though only a few years younger than the Financially Secure Working Couples, Couples with Children had been married for a much shorter time, on average only 13 years, the shortest of any married group. Conversely, at six years, their de facto relationships had been of longer duration than those of Financially Secure Working Couples, perhaps reflecting a generational shift towards de facto relationships among younger people. Couples with Children reported average levels of satisfaction with their current and past partners.

Couples with Children were somewhat overrepresented among those who reported discharging their credit card debts each month only 'sometimes', rather than 'often'. But with very low duration unemployment, very high rates of home buying, few financial hardships, and high levels of financial satisfaction, this was not a group that was struggling financially. Instead, it appeared to be a group that was investing heavily in raising children and building wealth, and its members seemed broadly satisfied with their economic circumstances.

More than half of Couples with Children reported having never smoked, more than would have been expected by chance. They also reported the highest levels of any group of general health, self-rated health, and satisfaction with their health. Similar to Working Age Couples, Couples with Children were less likely to report never having consumed alcohol, and they tended to be low-risk drinkers. This is supported by the finding that a significantly smaller proportion than would have been expected by chance reported drinking at levels considered to be risky for health in the long term. Together with Financially Secure Working Couples, they reported the lowest levels of having too much spare time. On the down side, Couples with Children reported the highest levels of feeling rushed and pressed for time of any group. Time pressures were perhaps impacting on their social connectedness. Couples with Children reported average to high levels of social support (significantly higher than the working age singles and disadvantaged Australians), and slightly, though not quite significantly, less likelihood compared with other groups of being an active member of a sporting, hobby or community-based association. Also, they tended to see their friends and extended families only 'sometimes' rather than 'often'. In view of these circumstances, this group is renamed 'Time Pressured Couples with Children'.

### **Cluster 4: Working Age Singles**

At 33 years old, Working Age Singles were the youngest of the five major groupings of Australians, with members of the Net Generation very heavily overrepresented in this group. Because they were in general young and single, there were too few marriages or de facto relationships to estimate or comment on their average duration. However, those who were in relationships reported the lowest levels of satisfaction with their partners of any group, and the second lowest levels of satisfaction with former partners.

Despite reporting only short duration unemployment, average job satisfaction, and having been relatively unlikely to have experienced their fathers' unemployment at the age of 14 years, this group reported some financial hardship and only middling satisfaction with their financial circumstances. Their slightly modest economic circumstances and negative perceptions were perhaps reflecting much higher rates of renting rather than home buying or ownership than would be expected by chance, and an overrepresentation of people who 'rarely' repaid outstanding amounts on their credit cards each month.

Working Age Singles reported roughly average levels of feeling rushed or pressed for time, and also of having too much spare time, and low to middling levels of life satisfaction. They were more likely than other groups to be smokers and, having started smoking, were much less likely to have given up smoking (perhaps because they were still young). Despite high rates of smoking, and most likely because of their youth, they reported very good general health, self-rated health, and satisfaction with their health. A small proportion of Working Age Singles were non-drinkers and a larger proportion were low-risk drinkers compared to other groups. Working Age Singles were not distinguishable from other groups in terms of risky alcohol consumption.

Working Age Singles were much more likely than the other groups to see friends and relatives not living with them ‘often’, rather than ‘sometimes’ or ‘rarely’. At the same time, they were no more or less likely than members of other groups to be an active member of a sporting, hobby or community-based association, and reported low social support, higher only than the Disadvantaged Australians. Because of their dissatisfaction with a number of facets of their lives compared with other groups in comparable or worse circumstances, this group is renamed ‘Dissatisfied Working Age Singles’.

### **Cluster 5: Disadvantaged Australians**

At 38 years old, Disadvantaged Australians were about the same age as Couples with Children and—like this group—Baby Boomers and, especially, members of Generation X were overrepresented among them. Fewer than 3 per cent of the group were aged 60 years or over. Those that were married had been so on average for 14 years. But with equal lowest levels of satisfaction with their current partners, and the lowest levels of satisfaction of any group in their relationships with former partners, Disadvantaged Australians did not seem happily partnered, nor did past relationships seem to have been satisfactorily resolved.

Employment experiences were markedly less satisfactory for this than for other clusters. Disadvantaged Australians had been unemployed on average for more than a year and a half, very much longer than any other group, and those that had jobs reported very low levels of job satisfaction. At 17 per cent, rates of experiencing their fathers’ unemployment when they were 14 years old were very high, even higher than for those who were born during the Great Depression. With an average of two forms of financial hardship each, rarely being able to pay their monthly credit card bill, very much elevated rates of renting (rather than owning or buying their homes), and exceptionally low levels of satisfaction with their financial circumstances, this was a group of people who were experiencing—and may well have had a history of experiencing—severe economic adversity.

Not surprisingly, levels of general life satisfaction in this group were very low. And while there was no evidence of Disadvantaged Australians feeling overly rushed or pressed for time, they reported high levels of having too much spare time, perhaps reflecting long duration unemployment. They were highly likely to be current smokers and, though they spent only an average amount of money on tobacco each week, this expenditure represented a very substantial slice of their total equivalised disposable income (13.5 per cent, approximately one-seventh). A greater proportion of Disadvantaged Australians than of other groupings had given up or drunk alcohol rarely and, as a result, they were underrepresented in low-risk drinkers. They were not significantly different from other groups in terms of risky consumption, though they approached significance in terms of elevated levels of risky drinking. Given the associations between risky drinking, socioeconomic disadvantage and poor health, this is surprising—perhaps reflecting the diversity of experiences within this grouping.

Consistent with their overall disadvantage, but not with their age profile, this group reported equal worst general health, poor self-rated health, and the lowest satisfaction with their health of any group. They had the lowest levels of social support of any group, were much less likely than any other group to be an active member of a sporting, hobby or community-based association, and were likely to see friends and extended family ‘rarely’, rather than ‘sometimes’ or ‘often’. Because of extensive disadvantage in every sphere of life, and exclusion from a wide range of forms of satisfactory adult participation in society, this group is renamed ‘Marginalised Australians’.

## 5.5 Preliminary conclusion

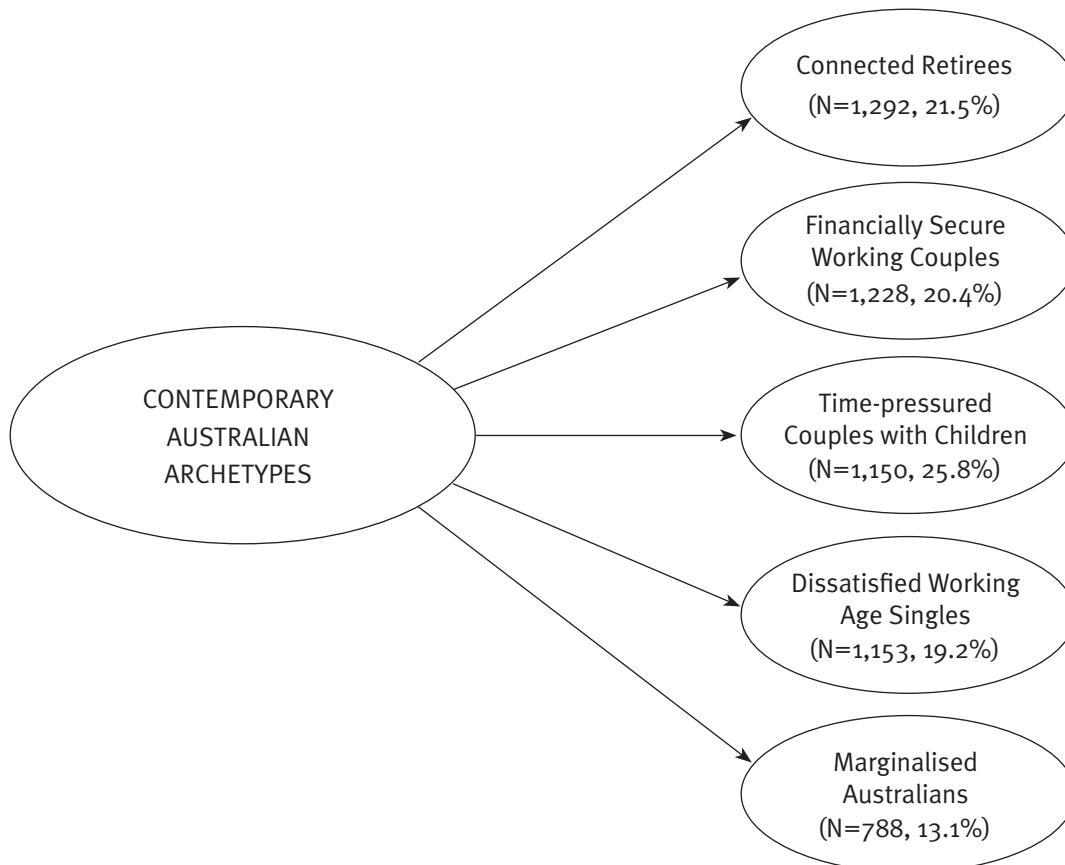
The results of the analyses of secondary variables were clearly consistent with the characteristics of the clusters derived from analyses of the primary variables, suggesting that this is a sound cluster solution. Each of the five clusters appears distinct from the others, and internally coherent. With this in mind, it was appropriate to take the final step in this analysis and to blend the findings from analyses of primary and secondary variables into profiles of each type. This is the topic of the next section.

## 6. Contemporary Australian archetypes

### 6.1 Contemporary Australian archetypes: a five-cluster solution

The findings of this study are the results of a first-order cluster analysis, that is, a first cluster analysis performed on the whole sub-sample drawn for this study. With such a large and representative sample, and with such wide-ranging sociodemographic, psychosocial and health factors taken into account, it can be expected that the findings of this analysis would be broad-brush. The five clusters that have been produced by this analysis provide an overview of how important characteristics are clustered within individuals. They can thus be considered to represent overarching groupings of people that live in Australian communities, or ‘contemporary Australian archetypes’, as represented in Figure 1.

**Figure 1: Contemporary Australian archetypes**



The sections below are therefore appropriately general, and intended to sketch the archetypes with a view to evaluating (i) the quality of the first order cluster solution and (ii) the usefulness of using this kind of analytic technique for social policy purposes. Each archetype is presented in turn, and is derived from a synthesis of the findings for each cluster in relation to the primary and secondary variables as described in the last section.

#### **Cluster 1: Connected Retirees**

Connected Retirees represented a little over one-fifth (21.5 per cent) of the sub-sample drawn for this study. With a mean age of 70 years, almost all were members of the Long Civic Generation, or Elders, and four-fifths were retired. This was for the most part a group of Australians that had been born and grown up around the time

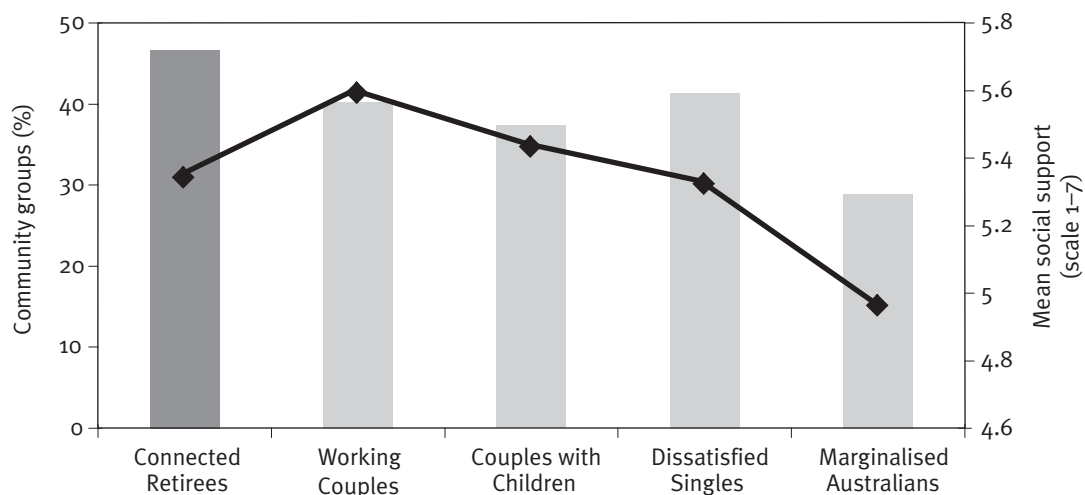
of the Great Depression and the Second World War. New Australians from English-speaking backgrounds were slightly overrepresented among Connected Retirees. Consistent with patterns of life expectancy, there were more women than men in this group.

Most of the members of this group were couples. They had been married for an average of 40 years and reported being extremely satisfied in their relationships. Despite these long and apparently happy marriages, almost one in five had been divorced at least once. At the same time, their relationships with their former partners were the most positive of any group. Consistent with the age profile of Connected Retirees, one-quarter were widowed, accounting for the overrepresentation of single people in the group. None of the respondents had children under the age of 15 years living with them, nor did they have any non-resident children.

With a mean equivalised disposable income of around \$25,000, this was a low-income group: around half of Connected Retirees reported relying on income support (mainly age-related payments) for 30 per cent or more of their income. Nevertheless, with very high rates of home ownership, and careful control of their expenditure, Connected Retirees reported the least financial hardship of any group and the greatest satisfaction with their financial circumstances. Consistent with the historical context of their youth, being born and growing up during the Great Depression and Second World War, one in six of Connected Retirees' fathers had been unemployed when the respondents were 14 years old. Most respondents did not complete their secondary education. Indeed, a large majority left school very early, before reaching the age of 16. Perhaps this early hardship—their own, or the common experience of it—accounts in part for the very high current satisfaction they expressed with their financial and other life circumstances. In terms of early adversities, other than lack of years of schooling and father's unemployment, only one in five respondents left home before turning 18, and fewer than one in 10 experienced their parents' separation or divorce.

Perhaps unsurprisingly given their age, many Connected Retirees reported low levels of satisfaction with their health. Nearly three-quarters fell into the worst category of physical functioning, and they reported the poorest general and self-rated health of any group. Despite these physical health problems, their mental health was no worse than average. They were the least likely by far of any cluster to be current smokers, and the most likely to have given up smoking. In terms of risky and low risk use of alcohol, they were no more or less likely than members of other groups to be consuming at risky levels. Their patterns of very low and non-consumption of alcohol merit comment. As described in Section 3, both risky consumption and non-consumption of alcohol tend to be associated with elevated levels of health problems. Connected Retirees were underrepresented in the non-consumption category. However, the association between non-consumption and mental health problems has not been found in older cohorts (Australian Bureau of Statistics 1998).

**Figure 2: Proportion actively involved in community groups and mean scores for social support for contemporary Australian archetypes**



Consistent with their satisfaction in specific areas of life, they reported the highest level of general life satisfaction of any group. They also had the lowest levels of feeling rushed or pressed for time, and yet did not have too much spare time. This was a socially connected group. While Connected Retirees were no more likely than other groups to see friends or extended family, and reported average levels of social support, almost half—well above average, and significantly more than the other groups—were currently active members of sporting, hobby or community-based associations (Figure 2).

**Cluster 2: Financially Secure Working Couples**

Financially Secure Working Couples represented one-fifth (20.4 per cent) of the sub-sample drawn for this study. There were even numbers of men and women, with an average age of 44 years. Baby Boomers were heavily overrepresented, and New Australians from English-speaking backgrounds were also somewhat overrepresented. The very large majority of Financially Secure Working Couples were in long-term marriages (more than 20 years on average). Their lengthy marriages, for their age, perhaps reflected their very high levels of satisfaction with their partners. Those who were not married commonly reported currently being in relatively short duration de facto relationships. This might be because a relatively large one in six had been divorced at least once and, given their age, were perhaps in the early years of a second long-term, marriage-like relationship. Married or de facto, they currently had no children under the age of 15 years living at home, nor any non-resident children.

With a mean equivalised disposable income of \$63,500, this was the highest-income group in the study; almost none of the group members were reliant on income support for any of their income, and none for 30 per cent or more of it. Their comfortable economic status (see Figure 3) appeared to be confirmed by their very high rates of home ownership or home buying, and of monthly full repayment of credit card bills, the shortest duration of unemployment of any working-age group, equal highest levels of job satisfaction, and equal highest satisfaction with their financial circumstances. Though spending more than any other group each week on tobacco, this cost them the lowest proportion of equivalised disposable income of any group.

Financially Secure Working Couples were the most highly educated group: more than one-quarter—a very large proportion—had completed a tertiary qualification or higher degree. The apparent privilege of this group was perhaps partly a reflection of the absence of early adversity in their lives.

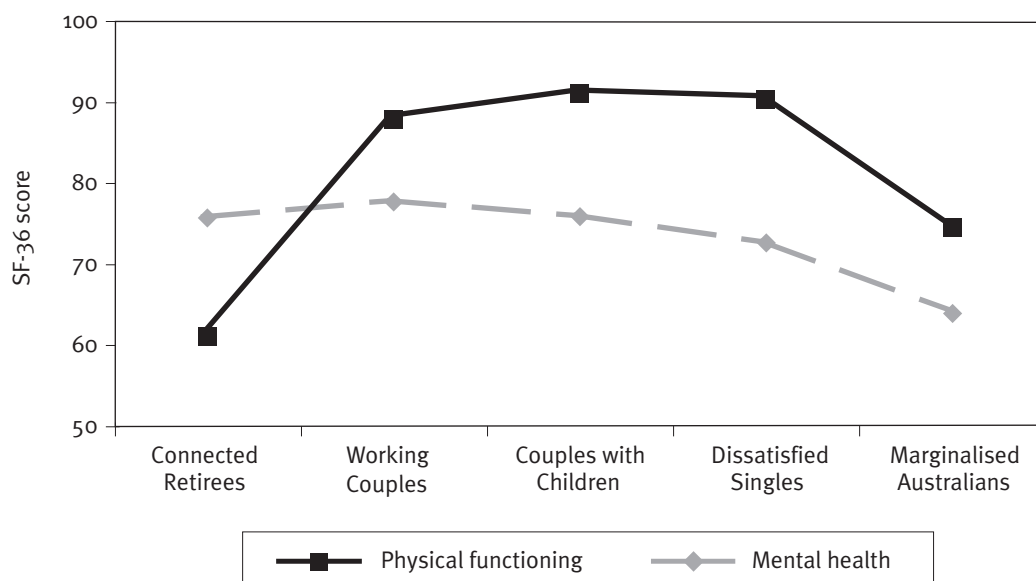
They were not likely to have left home early, left school early, or experienced their parents’ separation or divorce and, with only one in 10 having experienced their father’s unemployment when they were 14 years old, they appeared to have grown up in relatively favourable economic circumstances.

**Figure 3: Mean equivalised disposable annual income and mean satisfaction with financial situation for contemporary Australian archetypes**



Fewer than one in five members of the Financially Secure Working Couples group fell into the worst category for physical functioning or for mental health, and they reported very good general and self-rated health, and high levels of satisfaction with their health (Figure 4). Not only were Financially Secure Working Couples the healthiest group overall, they had among the lowest levels of key health risk behaviours. Nearly 80 per cent had never smoked or had given up. Nearly two-thirds consumed alcohol at a low level of risk (associated with better health), with another one-quarter no longer drinking, or drinking very rarely. Only 5 per cent reported never having consumed alcohol and these couples were not overrepresented among those consuming at risky levels. With only average levels of feeling rushed or pressed for time, and the lowest levels of having too much spare time, they also reported high levels of general life satisfaction (though they tended not to see friends or extended family ‘often’).

**Figure 4: Mean scores for physical functioning and mental health for contemporary Australian archetypes**



### Cluster 3: Time-pressured Couples with Children

Time-pressured Couples with Children represented one-quarter (25.8 per cent) of the sub-sample drawn for this study, and were the largest group. At 39 years old on average, Couples with Children were of working age, mainly members of Generation X, and with Baby Boomers also overrepresented. The group contained even numbers of women and men, and an ethnic mix reflecting that of the general population. All respondents in the Time-pressured Couples with Children archetype were living in a couple family with, on average, two children. At 42 per cent, this group contained the largest proportion of respondents that reported having non-resident children. Reflecting their mean age, they had been married for the shortest duration of any married group (on average, for 13 years), and fewer than one in 10 had ever been divorced. At an average of six years, and consistent with historical trends in relationships, this group reported the longest duration de facto relationships of any group. They reported average levels of satisfaction with their current and past partners.

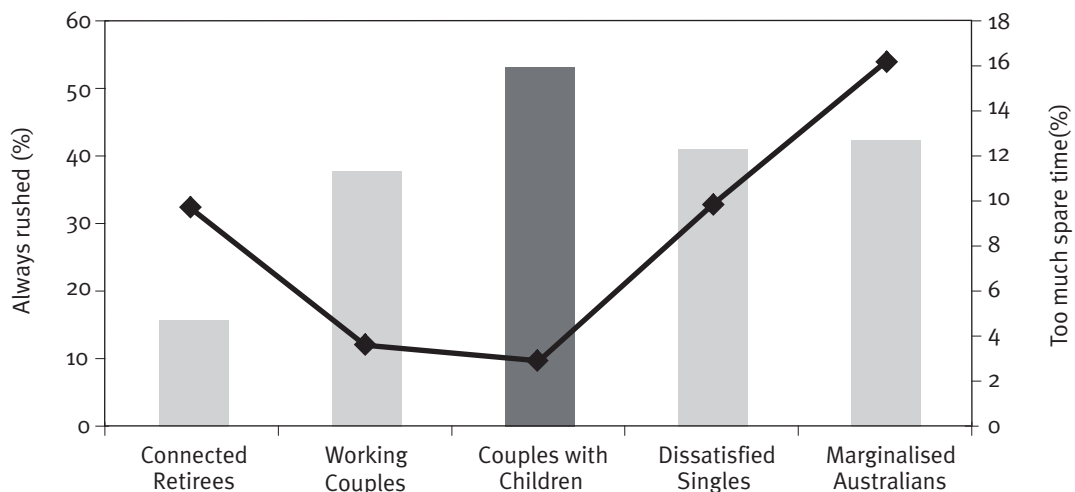
Time-pressured Couples with Children contained by far the largest proportion of respondents describing their occupation as part-time paid employment or home duties, reflecting the high proportion of mothers of children under the age of 15 years in the group. With a mean equivalised disposable income of \$38,500, members of this cluster received slightly less than average income, yet very few were in receipt of income support and fewer than one in 10 relied on it for more than 30 per cent of their income.

Despite being slightly overrepresented among those who reported paying their credit cards off each month only ‘sometimes’, rather than ‘usually’, this was a reasonably economically comfortable group. They had very low duration unemployment, very high rates of home buying, few financial hardships, and high levels of financial

satisfaction. This was also a fairly highly educated group. Nearly two-thirds had completed a post-secondary diploma or tertiary degree, and fewer than one in five had left school under the age of 16 years. In addition to some educational advantage, the group had experienced little childhood adversity generally, having not left home early, nor experienced their parents' separation or divorce at elevated rates.

Consistent with their parenting and paid work responsibilities, Time-pressured Couples with Children reported the highest levels of feeling rushed and pressed for time of any group and reported the lowest levels of having too much spare time (Figure 5). This time pressure perhaps explains their somewhat mediocre levels of social support, their slight tendency not to be an active member of a sporting, hobby or community-based association, and their tendency to see their friends and extended families only 'sometimes' rather than 'often'.

**Figure 5: Proportion always rushed and proportion with too much spare time for contemporary Australian archetypes**



Time-pressured Couples with Children reported good physical and mental health, and high levels of wellbeing. Fewer than one in seven fell into the worst category of physical functioning, and they reported the highest levels of general health, self-rated health, and satisfaction with their health of any group. More than half had never smoked, and barely one-quarter were located in the worst category of mental health. In terms of alcohol use, at nearly 60 per cent, these couples were overrepresented in the low risk category of alcohol consumption, the category associated with the best health outcomes. They were underrepresented in the groupings of alcohol consumption associated with health risks (risky drinking) and mental health problems (current non-drinking and, especially, the category that reports never having consumed alcohol).

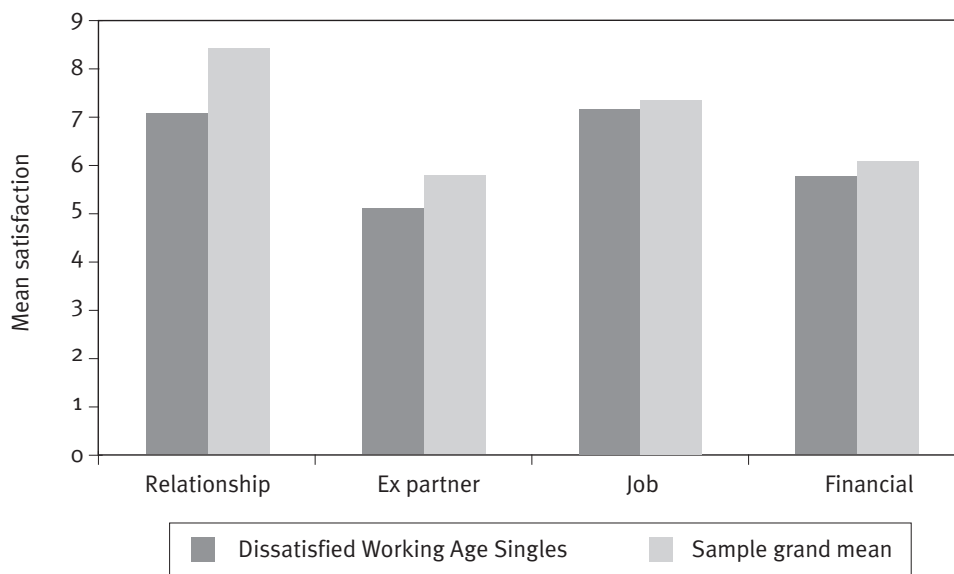
**Cluster 4: Dissatisfied Working Age Singles**

Dissatisfied Working Age Singles represented one-fifth (19.2 per cent) of the sub-sample drawn for this study and included slightly more men than women. At 33 years old, they were the youngest of the five major groupings of Australians, containing a heavy overrepresentation of members of the Net Generation. Four out of five members of this group were non-Indigenous Australian-born participants. Given their age, nearly three-quarters reported having never married, only 3 per cent had ever divorced, and nearly two-thirds were single, or living in other household types (such as group houses). Those that were in relationships reported the lowest levels of satisfaction with their partners of any group, and the second lowest levels of satisfaction with former partners. Though few had children under 15 years living with them, or non-resident children, single parents nevertheless comprised a substantial one-fifth of this group and were overrepresented.

With almost one-quarter of Dissatisfied Working Age Singles having completed a tertiary or higher degree, this was on average a highly-educated group. But their economic circumstances were quite complex. On the one hand, at nearly two-thirds of respondents, people in full-time paid employment were overrepresented

among Dissatisfied Working Age Singles. This was reflected in their somewhat higher than average equivalised household disposable income (\$48,000), very low rates of reliance on income support, and near absence of people reliant on income support for more than 30 per cent of their income. They also reported fairly short duration unemployment. On the other hand, they reported only average job satisfaction and were experiencing some financial hardship. They also had much higher than average rates of renting rather than home buying or ownership, an overrepresentation of people who ‘rarely’ repaid their credit card debts every month, and only middling satisfaction with their financial circumstances (Figure 6).

**Figure 6: Mean satisfaction with current relationship, relationship with most recent former partner, job, and financial situation comparing the Dissatisfied Working Age Singles with the sample grand mean**



Their current characteristics could probably not be attributed to the ongoing effects of early childhood adversity. Fewer than one in five had left home under the age of 18, only 13 per cent had left school early, they were not more likely than others to have experienced their parents’ separation or divorce (despite their being the youngest group), and they were relatively unlikely to have experienced their fathers’ unemployment at the age of 14 years.

Like their economic circumstances, Dissatisfied Working Age Singles’ health status was also quite complex. This was a fairly healthy group. They did not have an overrepresentation of people in the worst mental health category, and they reported much better than average physical functioning, general health, self-rated health, and satisfaction with their health. They also reported no particular problems with feeling rushed or pressed for time, or with having too much spare time, and were much more likely than the other groups to see friends and extended family often. Yet they expressed mediocre levels of life satisfaction and social support, and were more likely than most other groups to be currently smoking. And, perhaps because they were still very young, having started smoking they were much less likely to have given up smoking than were the members of other clusters. In this sense, they engaged at elevated levels in health risk behaviour. But in terms of alcohol use, Dissatisfied Working Age Singles were overrepresented in the low-risk category, and underrepresented in the category of people who no longer consumed alcohol, or consumed it very rarely. There was thus no evidence of risky use of alcohol.

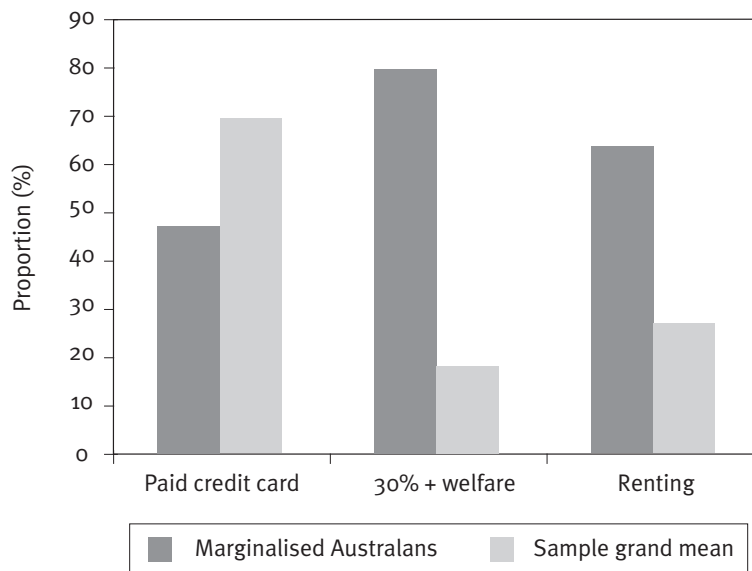
**Cluster 5: Marginalised Australians**

Marginalised Australians were by far the smallest of the major groupings of Australians, representing approximately one in eight (13.1 per cent) of the sub-sample drawn for this study. At an average of 38 years old, members of Generation X and, to a lesser extent, Baby Boomers were overrepresented among them. Nearly three-quarters were women and nearly one in 10, five times the national average, were Indigenous Australians. More than one-third of Marginalised Australians said they were currently separated or divorced, nearly half were living as single parent families, and more than one-third had non-resident children. Those that were married had been so on average for 14 years. But with equal lowest levels of satisfaction with their current partners, and the lowest levels of satisfaction in their relationships with former partners, Marginalised Australians were not happily partnered, nor had past relationships been satisfactorily resolved.

Nearly three-quarters described their employment status as home duties, students, or not in paid employment, and this was consequently a very low-income group. With a mean equivalised disposable income of less than \$20,000—below half the average (see Figure 3)—four in every five members of this group were reliant on income support for more than 30 per cent of their income. Nearly one-third of respondents were in receipt of Parenting Payment (Single), and another one-third reliant on NewStart or DSP payments. Long-term unemployment was common, and those who were in paid employment reported very low levels of job satisfaction.

Financial difficulties were extreme (Figure 7). With an average of two forms of financial hardship each (indicating severe hardship), rarely being able to pay their monthly credit card bill, exceptionally elevated rates of renting (rather than owning or buying their homes), and markedly low levels of satisfaction with their financial circumstances, Marginalised Australians exhibited severe economic adversity. No doubt related to poorer employment and economic circumstances, almost one-half of respondents had not completed secondary education. Instead they had left school, on average, at 15¾ years old.

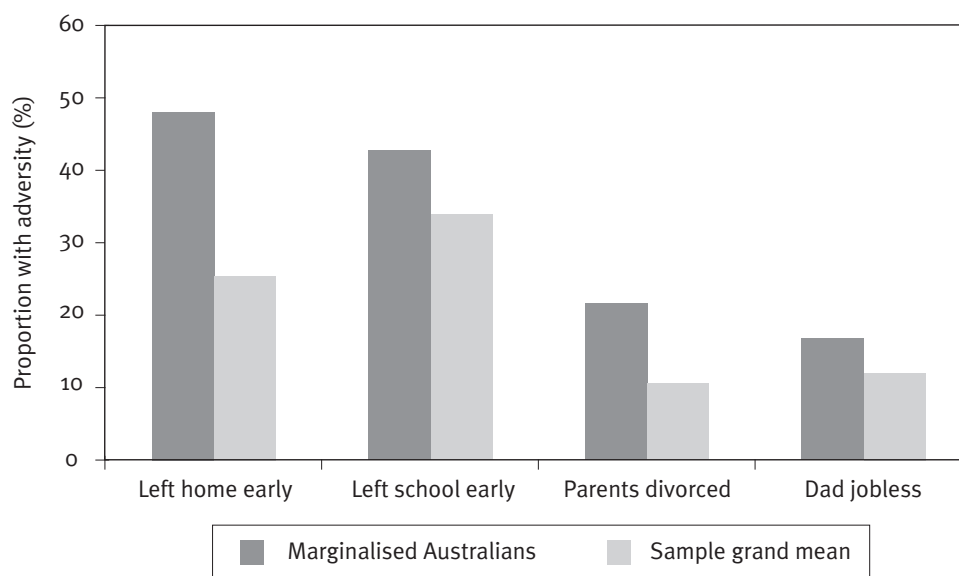
**Figure 7: Proportion of Marginalised Australians compared to sample grand mean usually paying credit card debts fully each month, reliant on income support for more than 30 per cent of their income, and renting rather than owning or buying their home**



Consistent with their adult experience of socioeconomic adversity, there was considerable evidence of severe early childhood adversity (Figure 8). Nearly half of Marginalised Australians had left home prematurely, more than two in five had left school early, and more than one-third had experienced the separation or divorce of their parents. They also reported very high rates of fathers’ unemployment when they were 14 years old.

They also tended to have very significant health and wellbeing problems (see Figure 4). Nearly half were in the worst mental grouping and nearly half in the worst physical functioning grouping. They reported the worst general health and the lowest satisfaction with their health of any group, and also poor self-rated health and very low general life satisfaction. Thus this was by far the unhealthiest and unhappiest group overall. They were highly likely to be current smokers and, despite spending no more than average on tobacco each week, this expenditure cost them a very substantial slice of their total equivalised disposable income, exacerbating their poverty.

**Figure 8: Proportion of Marginalised Australians compared to sample grand mean experiencing childhood adversity (parents divorced, father unemployed) and pseudomaturity (left home and school prematurely)**



Marginalised Australians were neither underrepresented nor overrepresented in the category of people that reported never having consumed alcohol, or consuming it at risky levels. However, consistent with their general disadvantage, they were very strikingly underrepresented in the low-risk alcohol consumption category, the category associated with the most positive health outcomes. They were also heavily overrepresented in the category of people who no longer drink, or who drink alcohol very rarely, perhaps suggesting they had stopped drinking, or cut back, for financial reasons.

With the lowest levels of social support of any group, and much less likelihood than others of being an active member of a sporting, hobby or community-based association (see Figure 2), or of seeing friends and extended family, Marginalised Australians experienced very poor social connectedness. Their reports of having far too much spare time were perhaps to some degree a reflection of their poor employment circumstances and also to some extent of their social isolation.

A summary of the characteristics of each archetype appears in Table 12.

Table 12: Contemporary Australian archetypes — a summary of key characteristics

| Connected Retirees   | Financially Secure Working Age Couples  | Time-pressured Couples with Children  | Dissatisfied Working Age Singles   | Marginalised Australians   |
|--|---|---|--|--|
| All over 55 years, average age 70 years, 60% women   | Most aged 15–55, average age 45 years, evenly men & women   | All aged 26–55, average age 39 years, evenly men & women  | Aged 15–55, average age 33 years, slightly more men  | Most aged 26–55, average age 38 years, 70% women   |
| More than 80% retired  | More than 70% in full-time paid work  | Full-time paid work, or many part-time and/or home duties   | Majority full-time paid work   | Home duties, students, not in paid employment, disabilities  |
| Low equivalised income and high reliance on income support, but high home ownership, credit card usually repaid, low financial hardship, high financial satisfaction | Very high equivalised income, no income support, own or buying home, credit card usually repaid, no financial hardship, high financial & highest job satisfaction | Equivalised income slightly below average, minimal use of income support, buying home, credit card sometimes paid, little financial hardship, fair to good job and financial satisfaction | Equivalised income above average, little use of income support, renting home, credit card rarely paid, some financial hardship; levels of satisfaction — job fair, financial low | Extremely low equivalised income, job & financial satisfaction, majority income support (80% for > one-third income), renting, credit card rarely paid, extreme financial hardship |
| Very low educational attainment, left school at 15 years   | Very highly educated — more than one-quarter tertiary or higher degree  | Highly educated — two-thirds diploma or tertiary degree   | Either highly educated or secondary education only   | Extremely low education; half do not complete secondary education  |
| Early socioeconomic hardship (Great Depression, WWII), but few other childhood adversities; no elevated pseudomaturity   | No early socioeconomic hardship, other childhood adversity rates not elevated; no elevated pseudomaturity   | Low levels of early socioeconomic hardship, and of other childhood adversity; low rates of pseudomaturity   | Low levels of early socioeconomic hardship, very low rates of pseudomaturity   | Highest levels of early socioeconomic hardship, extreme rates of pseudomaturity  |
| Married 40+ years, often not for first time; extremely happily partnered; relationship with former partner very good; large minority are widows                      | All married (20+ years), often not for first time, or de facto (4+ years); very happily partnered; relationship with former partner fair                          | All married (13+ years), few ever divorced, or de facto (6+ years); happily partnered; relationship with former partner fair  | Three-quarters never married, so almost none ever divorced. Lowest current partner satisfaction, and low former partner satisfaction   | Half single parent families, nearly one-third couples with children; one-third separated or divorced. Very low current and lowest former partner satisfaction                      |
| No children (still at home)  | No children (still at home)   | All have children (approx. 2) under 15 at home; 40% have non-resident children  | Mostly no children under 15 at home; but 10% have children or non-resident children under 15 years   | 1–2 children under 15 at home and one-third have non-resident children under 15 years  |

Table 12: Contemporary Australian archetypes — a summary of key characteristics (continued)

| Connected Retirees   | Financially Secure Working Age Couples   | Time-pressured Couples with Children   | Dissatisfied Working Age Singles  | Marginalised Australians   |
|--|--|--|---|--|
| Poor physical health and average satisfaction with health                        | Excellent physical health and satisfaction with health                             | Excellent (the best) physical health & wellbeing; highest satisfaction with health | Excellent physical health and satisfaction with health  | Extremely poor physical health for their age and lowest satisfaction with health                             |
| Average mental health and good wellbeing, high levels of life satisfaction       | Excellent mental health, excellent wellbeing & life satisfaction                   | Fair mental health & life satisfaction, very time-pressured                        | Fair mental health but low life satisfaction  | Extremely poor mental health, too much spare time, lowest life satisfaction                                  |
| Very low risk health behaviours (smoking, alcohol), good community participation | Very low risk health behaviours, good community participation, best social support | Very low risk health behaviours, average community participation                   | Likely to smoke, though also likely to have given up; low-risk alcohol consumption; highest contact with friends & family | Highly likely to smoke and highly unlikely to use alcohol; lowest levels of social participation — all types |
| <b>22%</b> (N=1,292)   | <b>20%</b> (N=1,228)   | <b>26%</b> (N=1,150)   | <b>19%</b> (N=1,153)  | <b>13%</b> (N=788)   |

## 6.2 Evaluation of cluster analysis

Having constructed profile descriptions of each of the contemporary Australian archetypes by synthesising findings from the cluster analysis and from analysis of the primary and secondary variables, it is possible to evaluate the cluster solution. The three most important criteria were substantive. They included (i) meaningfulness, (ii) scientific usefulness, and (iii) parsimony. A meaningful solution is one that is interpretable and self-evidently reasonable, while a scientifically useful solution is one that makes sense theoretically, or in terms of what is known or hypothesised within the field of research. A parsimonious solution is one in which the fewest number of clusters are used to produce a meaningful, scientifically useful, and statistically acceptable solution. Statistical criteria have also been presented (two agglomeration schedules and associated ratios of change). This combination of substantive and statistical criteria, with the substantive criteria emphasised, is essential to the sound evaluation of cluster solutions in psychiatric epidemiology (Beitchman et al. 2001).

### Addressing the evaluation criteria

A five-cluster solution has been presented comprising Connected Retirees, Financially Secure Working Couples, Time-pressured Couples with Children, Dissatisfied Working Age Singles, and Marginalised Australians. In terms of meaningfulness, this solution was self-evidently interpretable and generated intuitively appealing and recognisable overarching groupings of Australians. Further, the groupings sit comfortably with groupings of people that are already the focus of social policies, such as families with children, retired Australians, and people experiencing various disadvantages, corroborating the validity of the solution. Rather than suggesting that the analysis has done little more than replicate what was already known, the coherence of the cluster solution points to its underlying validity and indicates that the most important evaluation criterion is well met. Issues of its usefulness are addressed in Section 7, particularly the opportunities inherent in the issue of apparent anomalies in the archetypes.

### *Social policy validity*

This last point also assists in evaluating the solution in terms of the second criterion, scientific usefulness. This project has made use of epidemiological techniques to directly address a social policy research question. In terms of policy applicability, the solution fits with what would be expected (existing groupings in terms of social policy interventions), and extends them in two significant ways. Firstly, it draws attention to natural groupings of **all** Australians, paying equal attention to all types of people regardless of their particular circumstances and regardless of whether they would usually feature as groups of interest for social policy development.

Secondly, the solution brings together and interprets considerably more information about the archetypes than is usually available in one place to policy analysts. This includes generating detailed information about archetypes that might not normally be a key focus of social policy (such as Financially Secure Working Couples and Dissatisfied Working Age Singles).

### *Scientific validity*

With respect to the epidemiology of the concepts we have investigated and what is known about pathways to advantage and disadvantage, the five-cluster solution makes sense. For example, three of the archetypes are defined in terms of relationship status and family composition (Financially Secure Working Couples, Time-pressured Couples with Children, and Dissatisfied Working Age Singles). The characteristics of these groups are consistent with what is known about their age and status. For instance, dissatisfaction is a key issue among young people (Eckersley 1999), couples are happier than singles (Alonso et al. 2004), and couples without children are financially much better off than couples with children (Forster & d'Ercole 2005). A fourth category, Connected Retirees, was defined by age. Rates of psychiatric symptomatology decline with age (Butterworth et al. 2006a), and rates of home ownership rise (Headey, Marks & Wooden 2005), both of which were evident in this archetype.

The last category was defined by disadvantage, with a wide range of disadvantages, often at extreme levels, manifesting in the same, relatively small, group of people. This experience of multiple and severe disadvantage coalescing in the lives of a minority of community members is typical of the way in which disadvantage is unevenly distributed in the community (Creed, Muller & Patton 2003; Gilman et al. 2003; Nelson 2002; Pevalin & Goldberg 2003; Singh-Manoux et al. 2004; Turrell, Kavanagh & Subramanian 2005). This is also consistent with the neighbourhood, or geographic, concentration of disadvantage (Berry accepted) and its links to the intergenerational transmission of poverty and unemployment (Andrews, Green & Mangan 2002; Hunter 1995).

The five-cluster solution was thus consistent with existing scientific knowledge and evidence.

#### *Parsimony and statistical validity*

With respect to the final two evaluation criteria, we have already proposed that this solution (i) meets the criterion of parsimony to a high degree, in that it reduces a sample of over 6,000 respondents to five distinct yet internally coherent groupings (see Section 5), and (ii) meets the statistical criteria, with clear cut-points at five clusters evident for both the Akaike Information Criterion and the Schwarz's Bayesian Criterion.

## 6.3 Conclusion

We propose that the five-cluster solution we have generated meets all the evaluation criteria to a high degree. It is self-evidently meaningful, scientifically useful, and parsimonious, and it meets the statistical criteria. In this regard, it comprehensively addresses two of our three research questions. We have described (i) the major statistically discernable groupings of Australian community members in terms of their sociodemographic, psychosocial and health-related characteristics, and (ii) the key characteristics of each of these groupings and the features that differentiate them from each other. Our third research question, about the relevance of the identified groupings of people to social policy development, will be addressed in the next section.

By addressing our first two research questions, we have met the first three of our five detailed aims. That is, we have:

- reported on whether respondents within a large, nationally representative, social policy-oriented dataset could be categorised based on policy-relevant factors
- identified the characteristics that best describe each category
- prepared profiles summarising the key characteristics of each category using primary and secondary variables.

Our fourth aim, which belongs to our final research question, is to highlight findings from the analyses that might be of policy or program relevance. This will be addressed in the next section.

#### **Usefulness of cluster analytic techniques**

In addition to these research questions and aims, we had a fifth, meta-aim, which was to evaluate the usefulness of employing cluster analytic and associated techniques using large, nationally representative datasets. This kind of analysis has never been attempted on this scale or with these kinds of data before. The overarching scientific objective for conducting this study has been to provide an innovative perspective on the question: 'From a social policy perspective, are there new ways of thinking about what kinds of Australians there are and what they need?'

We have proposed five contemporary Australian archetypes that reflect at the broadest level distinct and recognisable types of people living in Australian communities. Each archetype is clearly different from the others, and each has a unique, internally coherent profile of strengths and vulnerabilities from which need (or the lack of need) may be inferred. The insight, clarity and meaning provided by the cluster solution suggest that these analytic techniques have the potential to be of great use in contributing to informing social policy development. While this analysis has been conducted using Australian data for an Australian social policy context, the successful experimental use of the technique could be expected to generate interest in other developed economies.

## 7. Summary and review of findings

### 7.1 Project summary and main findings

This report has presented the results of the first of a two-phase program of research being conducted from 2005 to 2007 investigating types of people living in Australian communities. In this phase, we have tested the appropriateness of the use of a particular analytic technique—cluster analysis—with a large nationally representative dataset to address a social policy question. The overarching scientific objective for conducting this study has been to provide an innovative perspective on the question:

From a social policy perspective, are there new ways of thinking about what kinds of Australians there are and what they need?

Our intention has been to provide a response to three research questions pertaining to (i) major statistically discernable groupings of Australian community members in terms of their sociodemographic, psychosocial and health-related characteristics; (ii) key characteristics of each category; and (iii) any relevance of our findings in an Australian social policy context. Based on our analysis of Wave 1 data from the HILDA Survey, we have proposed that there are five contemporary Australian archetypes that can be identified in terms of key sociodemographic, psychosocial and health factors:

1. Connected Retirees
2. Financially Secure Working Couples
3. Time-pressured Couples with Children
4. Dissatisfied Working Age Singles
5. Marginalised Australians.

As well as meeting the cluster solution evaluation criteria to a high degree, these archetypes have considerable intuitive appeal. Rather than suggesting that the analysis has done little more than replicate what was already known, the coherence of the cluster solution points to its underlying validity and indicates that the most important substantive evaluation criterion is particularly well met. Issues of the usefulness of these archetypes, and potential for further research, are addressed in more detail below, particularly the opportunities inherent in the issue of apparent anomalies.

In completing this analysis we have met the five aims of our project. We have:

- presented a statistically sound, meaningful, scientifically valid grouping of respondents using a large, nationally representative, social policy-oriented dataset
- identified the characteristics that best describe each category and that best discriminate between groupings
- prepared profiles that synthesise findings about the characteristics of each category in terms of primary and secondary variables—the clear differences between the groupings, their internal coherence, and their consistency with relevant published research point to the validity of our analysis and to the appropriateness of our selection of primary concepts and construction of variables for this study
- evaluated the usefulness of employing cluster analytic and associated techniques using large, nationally representative datasets, with respect to our overarching objective.

Finally, we had previously successfully piloted psychosocial profiling methodologies (cluster analytic techniques) using a general population sample in Australia (the *Eurobodalla Study*, Berry, Rodgers & Dear 2007; Berry & Shipley 2007). But these techniques had not previously been used with such a wide range of variables and such

a large, nationally representative sample, nor had they been used for research with directly social policy-applicable goals. The success of the use of this technique has enabled us to meet our final aim, relating to the experimental use of innovative analytic techniques that might be suitable for deployment to support the refinement of program and service development in a social policy context. We propose that this particular technique is valid and useful. More generally, it is our view that investment in the use of experimental and innovative research approaches is commendable and has the potential to deliver valuable returns beyond any delivered by this particular study.

## 7.2 Limitations of the study

### Data

One of the limitations of this study pertained to the concepts that were able to be included in the analyses. The HILDA Survey has generated an internationally outstanding collection of datasets, the first of which has been ideal for use in the current research. However, the study was not designed with the conduct of this research in mind, and it would be unreasonable to expect the data to meet our needs entirely. As a result we were not able to include in the cluster analysis measures of: aspirations, values or attitudes; emotional intelligence and optimism; or temperament and personality. The literature review that we presented in Section 3 clearly indicates the importance of each of these concepts. It is possible, therefore, that we have omitted important characteristics that might have led to a different cluster solution. This is a particular concern given the sensitivity of cluster analysis and potential instability of cluster solutions. Nevertheless, the HILDA data are broadly representative of all Australians, and we were able to include a very wide range of characteristics—certainly enough to produce a meaningful and useful grouping of Australians. We were able to include at least some aspects of most of the key concepts we identified in our literature review, including: adult relationships; economic participation, education, and financial circumstances; mental health; physical health; pseudomaturity and childhood adversities; social participation; and substance use.

A second data-related limitation pertained to the inclusiveness of the sampling, particularly with respect to Indigenous Australians (see Section 3). In addition to sampling issues, there were considerable issues to do with missing data on Indigenous status. We were initially unable to include Indigenous status at all in the study but, having identified a mechanism for imputing missing values, the resultant cluster solution was improved by the inclusion of Indigenous status.

By finding creative solutions to this and other missing data problems, and by locating or creating variables that could tap the majority of our key concepts, we were able to generate a final cluster solution that met all the evaluation criteria to a high degree. We have derived five archetypes of contemporary Australians that are strongly intuitively appealing, internally coherent, consistent with social policy groupings and with relevant published research, and useful both for science and policy applications. Further research will lead to the refinement and extension of these analyses (see the next section).

### Analytic limitations

A second area of limitation pertains to the use of cluster analytic techniques. Almost all forms of cluster analysis have been designed for use with small samples containing exclusively categorical data. These methods are clearly not appropriate for use with a large dataset containing a mix of continuous, ordinal and categorical data. Two-step clustering was designed to overcome these limitations, and the success achieved using this technique on Australian community samples (in this study, and in the *Eurobodalla Study*) has demonstrated its effectiveness. Nevertheless, cluster solutions can be unstable because they can change with the exclusion or addition of variables. Future research will help address outstanding questions about the robustness of the solution. In addition, it would be possible to structure future research designs in such a way as to experiment with the use of latent class analysis as an alternative method for testing the stability of categorisations of Australians.

## 7.3 Implications for policy and practice

### Understanding and managing stakeholder interests

One of the most demanding challenges in social policy is to achieve broad consensus about who will be the recipients of policy interventions, how any common interests will be defined, and what priority different groups will have relative to competing interests. This consensus, to the degree that can be achieved, is the end result of a political process (Edwards 2004). Bureaucratic process can refine the process of stakeholder definition and management. Where science can contribute relatively objective, relevant findings presented in an accessible format, information available to policy-makers can be enhanced.

Given the practical applicability of research findings based on cluster analysis, as reviewed in Section 2, this analytic approach is commonly used to generate profiles for the express purpose of improving the design and delivery of services and interventions (Adlaf & Zdanowicz 1999) by clarifying who the service recipients are. This goal is particularly relevant when service recipients have multiple needs or complicated characteristics (Beitchman et al. 2001), such as is commonly the case for recipients of FaCSIA's programs. A set of contemporary Australian archetypes has been presented in this study comprising Connected Retirees, Financially Secure Working Couples, Time-pressured Couples with Children, Dissatisfied Working Age Singles, and Marginalised Australians. These archetypes are consistent with existing groupings used for social policy interventions, and add richness and cohesion to what is already known about social policy stakeholder groups.

### Insights into prototypical groupings of Australians

In analysing **all** Australians, therefore, a number of possible avenues of policy and program application, and of further scientific inquiry, become evident, as described in the sections above. With the potential to chart life course and circumstantial trajectories in a meaningful way, including in terms of risk and resilience, and to identify key differences between groups, the opportunity exists to use scientifically derived information to assist in targeting and refining policy and procedures. In terms of this report, interest might centre on issues such as the trajectories that are associated with migration into or out of income support reliance, particularly heavy or chronic reliance, such as is commonly found among the Marginalised Australians cluster. But the archetypes could have other applications too, for example, in terms of helping inform decisions about taxation reform, neighbourhood renewal, or health care.

The strongest policy application of this research is therefore the insight it provides into natural groupings, and so into those for whom policy and programs are being, or might potentially be, developed. Of particular value, this is directly and highly targeted policy-relevant information that is independent of vested interests. It has been generated through the judicious use of a method of scientific analysis that helps the data (and therefore, as this is a nationally representative database, all Australians) to speak for themselves. This offers considerable potential to assist with the difficult task of understanding the lives and needs of all Australians holistically, and as objectively as possible. This, in turn, can contribute to the process of balancing competing interests and strongly held stakeholder group views (Miller 2005) when developing policy.

### Entitlement or need?

A particular strength of this analysis is that the archetypes highlight natural groupings of **all** Australians, not just those who tend to dominate policy attention. We have argued that a distortion in focus occurs as a result of categorising people according to eligibility for income support. This occurs because the process of establishing entitlement necessarily places all those who qualify for support in one basket, and those who do not in another. The distortion of focus is that considerable attention is paid to the former, and less to the latter, with limited attention given to a substantial minority of Australians who for a variety of reasons are at risk of requiring income support. Marginalised Australians are overwhelmingly and heavily reliant on income support. By examining their characteristics, and comparing these factors with the characteristics of members of other archetypes, it is possible to detect key differences between them. Taken together, these are indicators of **risk** of requiring income support or, alternatively, of resilience.

One of the elements of the process of establishing entitlement, and of ensuring that recipients access appropriate levels of support, involves controlling access to more complex, expensive interventions. Applicants who qualify for assistance are automatically channelled into the least expensive support option, and offered supplementary assistance after initial interventions or treatments have failed to provide sufficient support. People with high and complex needs, therefore, move in the same sequence through the same treatments as other applicants. Increasing awareness of which factors taken together might indicate a need for more intensive services could assist in more responsive tailoring of services around individual needs. This has the potential to avoid providing services that are unlikely to work, resulting in budgetary savings, and avoiding unnecessary customer inconvenience.

### **Sub-types of Australians**

To fully realise the potential of this kind of analysis in assisting with understanding and managing stakeholder interests, it is necessary to drill down into the types. Even when key and quite specific groupings have been defined, members of these groupings can still demonstrate considerable heterogeneity, and tend not to respond optimally to off-the-shelf solutions. Instead, certainly in the social policy arena, tailor-made services and interventions are required (Berry & Butterworth 2003; Butterworth & Berry 2004). All Australians do not, of course, fall neatly into five archetypes.

Despite the strength of the cluster solution, including the stark differences between types, and within-type similarity and coherence, there is considerable heterogeneity within the archetypes. For example, the large majority of Connected Retirees were couples yet one-quarter of the members of the archetype were widows, who were older, less physically well, less financially comfortable, and lonelier than the other Connected Retirees. It could be assumed that social policy that might suit most Connected Retirees might not suit widows, who seem to have quite different experiences and consequently would have different needs. To take a different archetype, a small percentage of Financially Secure Working Couples were actually couples with children experiencing some financial hardship and not in control of their credit card expenditure. It might be appropriate to consider these families at risk of reliance on income support, and of all the disadvantages that go with it. And while a clear majority of single parents were found among Marginalised Australians, a large minority were members of the Dissatisfied Working Age Singles group.

This heterogeneity does not represent a set of anomalies, or weaknesses, in the cluster analysis. Rather, it points to three opportunities. Firstly, it provides insight into when it is valid and appropriate to consider a grouping to be homogeneous, and when it is more appropriate to seek to understand a group at a finer level of distinction. Secondly, it demonstrates the value of interpreting the first-order cluster solution in terms of archetypes, or broad generalisations, that are helpful at a heuristic level and paint a picture of the social landscape as a whole. This provides a clear, meaningful conceptual framework within which to situate more detailed analyses. Thirdly, apparent anomalies indicate where and how to look more deeply into the data.

### *The role of case studies*

This might best be illustrated by an example. It is common for single parents to experience significant disadvantages relative to people raising children as a couple. This might explain why most single parents in this study were located in the Marginalised Australians grouping. However, single parents do not form one homogeneous grouping. They are diverse, with a large minority **not** found in the Marginalised Australians archetype, posing the question ‘how do those who are, differ from those who are not, in a particular archetype?’. For example, does one domain of factors dominate, such as mental health? The answers to such questions provide valuable insights into how risk and protective factors operate in real people’s lives. A useful way to approach questions such as these is through the development of scientifically based case studies that focus on fine distinctions within a particular category of persons—such as single parents reliant on income support or not, people who have not been in paid employment for less than or more than a year, or widows compared with their same age peers who are not widowed. It would be particularly useful to conduct the case studies within a framework of an existing policy and associated procedures. Depending on the policy, this might also offer the opportunity of conducting cross-portfolio research.

## 7.4 Future research

With its size, coverage of concepts, and national representativeness, the HILDA data can be interrogated to assist in answering such questions. Other datasets would also provide valuable opportunities, as discussed above. Further, research questions such as those described above can also help inform the design of studies using other datasets, particularly where there might be an opportunity to design the question into primary data collection. The first of these possibilities will be the subject of the second phase of this program of research. The final section of this report overviews a range of possibilities for future research.

### *Multiple random samples from Wave 1 HILDA data*

The present study was based on a random sample drawn from data collected for Wave 1 of the HILDA Survey. A simple first step in validating the findings of this study would be to conduct the same analysis on a second random sample also drawn from Wave 1 of the HILDA Survey. This procedure could be repeated any number of times but, in practice, once would be sufficient to draw a conclusion about the stability of the cluster solution using Wave 1 HILDA data. It would also be valuable to conduct the same analysis using all respondents in the survey. This would have two benefits: it would allow a judgement to be made about whether including all members of a household distorts the analysis and, if it does not, it would enable population weightings to be used to estimate the population prevalence of each archetype.

### *Random samples from other waves of HILDA*

Due to attrition and the addition of new participants at each time point, each wave of data for the HILDA Survey contains somewhat different respondents. A further step in testing the validity of the cluster solution presented in this report would be to conduct the same analysis, using the same variables, on a random sample of participants drawn from another wave of data from the HILDA Survey. In addition, each wave contains a different special focus issue, and data on other relevant concepts are available in different waves. An additional benefit of this approach, therefore, would be that concepts that could not be included in our study could be included in a validating study. For example, a key omission from the present analysis was coverage of the concept of temperament and personality. Wave 5 data collected for the HILDA Survey contains a brief measure of personality, and this would offer the opportunity to gain some insight into the operation of this important factor in terms of contemporary Australian archetypes.

### *Validation studies using other data*

There are other datasets that would be appropriate for use in validation studies for this study because they are large, nationally representative studies containing broadly comparable variables. Two such studies are particularly relevant. These are the *Growing Up in Australia* study (the Longitudinal Study of Australian Children) and the *Footprints in Time* study (The Longitudinal Study of Indigenous Children), the latter initiated by FaCSIA following the handing down of the 2003–04 Budget. The *Footprints in Time* study is of particular value as it directly helps address our concerns about the HILDA data with respect to the inclusion of Indigenous Australians.

### **Possible extensions of this study**

Some of the studies proposed above would not only help validate the findings of the present study, but would also directly extend this research. The second phase of the present program of research, being conducted in 2006, will also extend the analysis conducted for this study. It will explore ‘types within types’ by conducting second order cluster analyses of each contemporary Australian Archetype, producing a set of sub-types of each archetype. The full set of variables used for the first phase of the program of research will be used in the second phase. In addition, to extend the analyses of each sub-type, the first phase variables will be supplemented by the use of a number of additional variables examining two vital facets of contemporary Australian life in greater depth: social participation and economic participation. This will involve drilling down below the level of archetypes and providing more detailed information about secondary types. At this level of analysis, the results

of the study will have more direct policy applicability because they will be more detailed and specific. If including all members of a household in the cluster analysis does not distort the cluster solution, this would mean we could use the entire sample for our phase two study, providing larger numbers for each sub-type, which would enable us to conduct more analyses within sub-types.

### *Life course and circumstantial development*

Two further extensions of this research could prove particularly valuable in policy development. The first would be to examine change in type over time. It could be expected that people would migrate between types over time due to (i) changes in their circumstances and (ii) life course development. Two research questions are of particular interest. The first concerns consideration of whether some people are more likely than others to migrate between types and, if so, which characteristics best predict this migration, and likely trajectories. This broad area would reflect a range of factors associated with risk and resilience. The second question concerns development over the life course, and whether being in a particular category at one point in time predicts movement into another category at a later time. For example, do Time-pressured Couples with Children tend by default to become Financially Secure Working Age Couples, or do they develop into Connected Retirees? What happens to them if they separate? Do they migrate to the Dissatisfied Working Age Singles group, or do they become Marginalised Australians? What would predict this? With around 60 separations a year in the HILDA Survey, there will soon be sufficient data to address some of these questions. The conduct of scientifically-based case studies would be particularly informative in approaching such issues, and is discussed in more detail below.

A related research question is to examine the trajectories of children. This would involve conducting a cluster analysis of children in the first instance and then connecting the children with their parents, or identifying which children go with which adults. The research question in this case would be about whether certain clusters of children tend to be found with certain clusters of adults. A natural extension of this research would be to track archetypal life course development longitudinally to examine trajectories through archetypes from childhood, rather than starting from early adulthood. This would have numerous benefits for policy development, and also for science, in terms of questions about the intergenerational handing down of advantage and disadvantage.

## **7.5 Conclusion**

This study is the first Australian research to use cluster analytic techniques to explore how a wide variety of sociodemographic, psychosocial and health factors combine and find expression in the lives of Australians. The analysis has been based on a large, nationally representative dataset with a social policy focus. Because of this, the findings are broadly applicable to all Australians, and directly relevant for social policy purposes. The construction of five contemporary Australian archetypes is a unique, pragmatic and intellectually sound way of making sense of the enormous heterogeneity of Australians. The study has demonstrated the value of investing in experimental research. In addition, its findings have considerable potential to contribute to the difficult task of defining and understanding key stakeholder groupings accurately, sensitively and meaningfully.

## Endnotes

1. Dispositional optimism can be compared to a personality characteristic, or trait, in that it constitutes a typical feature of a person's orientation to life and underlying motivation with regard to their behaviour. Optimism can also refer to having an 'optimistic explanatory style' which is a situation-specific way of thinking about, and consequently reacting to, positive and negative life events.
2. In Australia, for four cohorts born in 1961, 1965, 1970 and 1975, around one in five people left home before 18 years of age, fewer than one in five were married and only one in 10 were in de facto relationships at the age of 21 years (Hillman & Marks 2002).
3. Incomplete secondary schooling in particular, as well as failure to complete post-school qualifications, is linked to poor adult socioeconomic outcomes. Thus, while not all young Australians who leave school early or who do not proceed immediately to tertiary studies experience adverse socioeconomic outcomes (McMillan & Marks 2003), failure to achieve basic school completion is an important aspect of pseudomaturity.



# References

- Adlaf, EM & Zdanowicz, YM 1999, 'A cluster-analytic study of substance problems and mental health among street youth', *American Journal of Drug and Alcohol Abuse*, vol. 25, pp. 639–60.
- Akiskal, HS, Mendlowicz, MV, Jean-Louis, G, Rapaport, MH, Kelsoe, JR, Gillin, JC & Smith, TL 2005, 'TEMPS-A: validation of a short version of a self-rated instrument designed to measure variations in temperament', *Journal of Affective Disorders*, vol. 85, pp. 45–52.
- Alonso, J, Angermeyer, MC, Bernert, S, Bruffaerts, R, Brugha, TS, Bryson, H, Girolamo, G, Graaf, R, Demyttenaere, K, Gasquet, I, Haro, JM, Katz, SJ, Kessler, RC, Kovess, V, Lépine, JP, Ormel, J, Polidori, G, Russo, LJ, Vilagut, G, Almansa, J, Arbabzadeh-Bouchez, S, Autonell, J, Bernal, M, Buist-Bouwman, MA, Codony, M, Domingo-Salvany, A, Ferrer, M, Joo, SS, Martínez-Alonso, M, Matschinger, H, Mazzi, F, Morgan, Z, Morosini, P, Palacín, C, Romera, B, Taub, N & Vollebergh, WAM 2004, 'Prevalence of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project', *Acta Psychiatrica Scandinavica*, vol. 109, pp. 21–27.
- Amato, PR 1996, 'Explaining the intergenerational transmission of divorce', *Journal of Marriage and the Family*, vol. 58, pp. 628–40.
- Amato, PR & Keith, B 1991, 'Parental divorce and adult well-being: a meta-analysis', *Journal of Marriage and the Family*, vol. 53, pp. 43–58.
- Andrews, D, Green, C & Mangan, J 2002, *Neighbourhood effects and community spillovers in the Australian youth labour market*, ACER: The Australian Council for Educational Research Ltd, Camberwell, Victoria.
- Andrews, G, Hall, W, Teesson, M & Henderson, S 1999, *The mental health of Australians*, Mental Health Branch, Commonwealth Department of Health and Aged Care, Canberra.
- Andrews, G, Henderson, S & Hall, W 2001, 'Prevalence, comorbidity, disability, and service utilisation', *British Journal of Psychiatry*, vol. 178, pp. 145–53.
- Andrews, G, Issakidis, C & Slade, T 2001, 'The clinical significance of mental disorders' in M Teesson & L Burns (eds), *The National Comorbidity Project*, pp. 19–31, Commonwealth Department of Health and Aged Care, Canberra.
- Asendorpf, JB & van Aken, MAG 1999, 'Resilient, overcontrolled, and undercontrolled personality prototypes in childhood: replicability, predictive power, and the trait-type issue', *Journal of Personality and Social Psychology*, vol. 77, pp. 815–32.
- Austin, EJ, Saklofske, DH, Huang, SHS & McKenney, D 2004, 'Measurement of trait emotional intelligence: testing and cross-validating a modified version of Schutte et al.'s (1998) measure', *Personality and Individual Differences*, vol. 36, pp. 555–62.
- Australian Bureau of Statistics 1998, *Mental Health and Wellbeing: Profile of Adults, Australia*, cat. no. 4326.0, ABS, Canberra.
- — 2003, *Information Paper: Suicides, Australia 2001*, cat. no. 3309.0.55.001, ABS, Canberra.
- Bacher, J, Wenzig, K & Vogler, M 2004, *SPSS twostep cluster—a first evaluation*, 2nd edn, <<http://www.sozioogie.wiso.uni-erlangen.de/publikationen>>.
- Barbieri, P 1998, 'Regolazione istituzionale e redistribuzione dello stigma' (Institutional Regulation and Stigma), *Rassegna Italiana di Sociologia*, vol. 39, pp. 249–72.
- Baum, F 1999, 'The role of social capital in health promotion: Australian perspectives', paper presented at the 11th National Health Promotion Conference, Perth, Western Australia, 20–23 May.

- Baum, FE, Bush, RA, Modra, CC, Murray, CJ, Cox, EM, Alexander, KM & Potter, RC 2000, 'Epidemiology of participation: an Australian community study', *Journal of Epidemiology & Community Health*, vol. 54, pp. 414–23.
- Baydar, N, Reid, MJ & Webster-Stratton, C 2003, 'The role of mental health factors and program engagement in the effectiveness of a preventive parenting program for Head Start mothers', *Child Development*, vol. 74, pp. 1433–53.
- Beitchman, JH, Adlaf, EM, Douglas, L, Atkinson, L, Young, A, Johnson, CJ, Escobar, M & Wilson, B 2001, 'Comorbidity of psychiatric and substance use disorders in late adolescence: a cluster analytic approach', *American Journal of Drug & Alcohol Abuse*, vol. 27, pp. 421–40.
- Benzeval, M 1998, 'The self-reported health status of lone parents', *Social Science & Medicine*, vol. 46, pp. 1337–53.
- Berry, HL accepted, '*Crowded suburbs and killer cities: a brief review of the relationship between the urban environment and mental health*', *NSW Public Health Bulletin*.
- Berry, HL forthcoming, *Economic and social participation among different types of people in Australian communities*, The Australian National University, Canberra.
- Berry, HL & Butterworth, P 2003, *Overcoming mental health barriers to social and economic participation*, The Australian National University, Canberra.
- Berry, HL, George, E, Butterworth, P, Rodgers, B & Caldwell, TM 2007, *Intergenerational reliance on income support: psychosocial factors and their measurement*, Social Policy Research Paper No. 31, Department of Families, Community Services and Indigenous Affairs, Canberra.
- Berry, HL & Rickwood, DJ 2000, 'Measuring social capital at the individual level: personal social capital, values and psychological distress', *International Journal of Mental Health Promotion*, vol. 2, pp. 35–44.
- Berry, HL & Rodgers, B 2003, 'Trust and distress in three generations of rural Australians', *Australasian Psychiatry*, vol. 11, issue S1, pp. S131–37.
- Berry, HL, Rodgers, B & Dear, KBG 2007, 'Preliminary development and validation of an Australian Community Participation Questionnaire: types of participation and associations with distress in a coastal community', *Social Science & Medicine*, vol. 64, pp. 1719–37.
- Berry, HL & Shipley, M 2007, *Longing to belong: personal social capital and psychological distress in an Australian coastal region*, The Australian National University, Canberra.
- Bond, L, Glover, S, Godfrey, C, Butler, H & Patton, GC 2001, 'Building capacity for system-level change in schools: lessons from the Gatehouse project', *Health Education & Behavior*, vol. 28, pp. 368–83.
- Brindis, CD 2006, 'A public health success: understanding policy changes related to teen sexual activity and pregnancy', *Annual Review of Public Health*, vol. 27, pp. 277–95.
- Brown, GW, Andrews, B, Bifulco, A, Adler, Z & Bridge, L 1986, 'Social support, self-esteem and depression', *Psychological Medicine*, vol. 16, pp. 813–31.
- Brown, GW, Harris, TO, Hepworth, C & Robinson, R 1994, 'Clinical and psychosocial origins of chronic depressive episodes. II. A patient enquiry', *British Journal of Psychiatry*, vol. 165, pp. 457–65.
- Brown, K, Lipsig-Mumme, C & Zajdow, G 2003, *Active citizenship and the secondary school experience: community participation rates of Australian youth*, ACER: The Australian Council for Educational Research Ltd, Camberwell, Victoria.

- Browne, G, Gafni, A, Roberts, J, Byrne, C & Majumdar, B 2004, 'Effective/efficient mental health programs for school-age children: a synthesis of reviews', *Social Science & Medicine*, vol. 58, pp. 1367–84.
- Brownson, RC, Royer, C, Ewing, R & McBride, TD 2006, 'Researchers and policymakers: travelers in parallel universes', *American Journal of Preventive Medicine*, vol. 30, pp. 164–72.
- Burniaux, J-M, Dang, T-T, Fore, D, Forster, M, d'Ercole, MM & Oxley, H 1998, *Income distribution and poverty in selected OECD Countries*, Report 189, OECD, Paris.
- Burris, S 2006, 'Stigma and the law', *The Lancet*, vol. 367, pp. 529–31.
- Butterworth, P 2003a, *Estimating the prevalence of mental disorders among income support recipients: approach, validity and findings*, Social Policy Research Paper No. 21, Department of Family and Community Services, Canberra.
- — 2003b, 'The prevalence of mental disorders among income support recipients: an important issue for welfare reform', *Australian and New Zealand Journal of Public Health*, vol. 27, pp. 441–48.
- — 2004, 'Lone mothers' experience of physical and sexual violence: association with psychiatric disorders', *British Journal of Psychiatry*, vol. 184, pp. 21–27.
- Butterworth, P & Berry, HL 2004, 'Addressing mental health problems as a strategy to promote employment: an overview of interventions and approaches', *Australian Social Policy*, pp. 19–49.
- Butterworth, P & Crosier, T 2004, 'The validity of the SF-36 in an Australian national household survey: demonstrating the applicability of the Household Income and Labour Dynamics in Australia (HILDA) survey to examination of health inequalities', *BMC Public Health*, vol. 4, p. 44.
- Butterworth, P, Crosier, T & Rodgers, B 2004, 'Mental health problems, disability and income support receipt: a replication and extension using the HILDA survey', *Australian Journal of Labour Economics*, vol. 7, pp. 135–58.
- Butterworth, P, Gill, SC, Rodgers, B, Anstey, KJ, Villamil, E & Melzer, D 2006a, 'Retirement and mental health: analysis of the Australian national survey of mental health and well-being', *Social Science & Medicine*, vol. 62, pp. 179–91.
- Butterworth, P, Oz, T, Rodgers, B & Berry, HL 2006b, *Partnered and lone-parent families: describing changing families*, The Australian National University, Canberra.
- Byrne, C, Browne, G, Roberts, J, Ewart, B, Schuster, M, Underwood, J, Flynn-Kingston, S, Rennick, K, Bell, B, Gafni, A, Watt, S, Ashford, Y & Jamieson, E 1998, 'Surviving social assistance: 12-month prevalence of depression in sole-support parents receiving social assistance', *Canadian Medical Association Journal*, vol. 158, pp. 881–88.
- Caldwell, TM, Rodgers, B, Jorm, AF, Christensen, H, Jacomb, PA, Korten, AE & Lynskey, MT 2002, 'Patterns of association between alcohol consumption and symptoms of depression and anxiety in young adults', *Addiction*, vol. 97, pp. 583–94.
- California Institute for Mental Health 2001, *Six County case study: moving beyond implementation to identification and service*, CIMH, Sacramento.
- Camacho, TC, Kaplan, GA & Cohen, RD 1987, 'Alcohol consumption and mortality in Alameda County', *Journal of Chronic Disease*, vol. 40, pp. 229–36.
- Cannuscio, CC, Colditz, GA, Rimm, EB, Berkman, LF, Jones, CP & Kawachi, I 2004, 'Employment status, social ties, and caregivers' mental health', *Social Science & Medicine*, vol. 58, pp. 1247–56.
- Casper, ES, Oursler, J, Schmidt, LT & Gill, KJ 2002, 'Measuring practitioners' beliefs, goals, and practices in psychiatric rehabilitation', *Psychiatric Rehabilitation Journal*, vol. 25, pp. 223–34.

- Chamberlain, G 1990, 'Distinguished Fellow: Arthur S. Goldberger and latent variables in econometrics', *The Journal of Economic Perspectives*, vol. 4, pp. 125–52
- Champion, LA, Goodall, G & Rutter, M 1995, 'Behaviour problems in childhood and stressors in early adult life. I. A 20 year follow-up of London school children', *Psychological Medicine*, vol. 25, pp. 231–46.
- Chung, H & Elias, M 1996, 'Patterns of adolescent involvement in problem behaviors: relationship to self-efficacy, social competencies, and life events', *American Journal of Community Psychology*, vol. 24, pp. 771–84.
- Ciarrochi, J, Chan, AYC & Bajgar, J 2001, 'Measuring emotional intelligence in adolescents', *Personality and Individual Differences*, vol. 31, pp. 1105–19.
- Ciarrochi, J, Deane, FP & Anderson, S 2002, 'Emotional intelligence moderates the relationship between stress and mental health', *Personality and Individual Differences*, vol. 32, pp. 197–209.
- Clausen, JA & Jones, CJ 1998, 'Predicting personality stability across the life span: the role of competence and work and family commitments', *Journal of Adult Development*, vol. 5, pp. 73–83.
- Cloninger, CR & Svrakic, DM 2000, 'Personality disorders', in BJS Sadock & VA Sadock (eds), *Comprehensive textbook of psychiatry*, Williams & Wilkins, Philadelphia, pp. 1723–64.
- Cohen, S, Mermelstein, R, Kamarck, T & Hoberman, HM 1985, 'Interpersonal support evaluation list', in GS Sarason & BR Sarason (eds), *Social support: theory, research and application*, Martinus Nijhoff, Washington.
- Coiro, MJ 2001, 'Depressive symptoms among women receiving welfare', *Women Health*, vol. 32, pp. 1–23.
- Comino, EJ, Harris, E, Chey, T, Manicavasagar, V, Wall, JP, Davies, GP & Harris, MF 2003, 'Relationship between mental health disorders and unemployment status in Australian adults', *Australian and New Zealand Journal of Psychiatry*, vol. 37, pp. 230–35.
- Commonwealth of Australia 2002, *Budget Paper No. 5: Intergenerational Report 2002–03*, AGPS, Canberra.
- Corrao, G, Bagnardi, V, Zambon, A & La Vecchia, C 2004, 'A meta-analysis of alcohol consumption and the risk of 15 diseases', *Preventative Medicine*, vol. 38, pp. 613–19.
- Corrigan, PW & Miller, FE 2004, 'Shame, blame, and contamination: a review of the impact of mental illness stigma on family members', *Journal of Mental Health*, vol. 13, pp. 537–48.
- Creed, PA, Muller, J & Patton, W 2003, 'Leaving high school: the influence and consequences for psychological well-being and career-related confidence', *Journal of Adolescence*, vol. 26, pp. 295–311.
- Croft, T 2002, 'Intensive assessment for *intensive assistance*: unemployment, mental health and the need for holistic assessment of long-term unemployed people', *Australian Journal of Social Issues*, vol. 37, pp. 153–72.
- Danziger, SK & Seefeldt, KS 2002, 'Barriers to employment and the "hard to serve": implications for services, sanctions, and time limits', *Focus*, vol. 22, pp. 76–81.
- Danziger, SK, Corcoran, M, Danziger, S, Heflin, C, Kalil, A, Levine, J, Rosen, D, Seedfeldt, K, Siefert, K & Tolman, R 2000, 'Barriers to the employment of welfare recipients', in R Cherry & M Rodgers III (eds), *Prosperity for all? The economic boom and African Americans*, Russell Sage Foundation, Ann Arbor.
- Dawda, D & Hart, SD 2000, 'Assessing emotional intelligence: reliability and validity of the Bar-On Emotional Quotient Inventory (EQ-i) in university students', *Personality and Individual Differences*, vol. 28, pp. 797–812.
- Degenhardt, L, Hall, W & Lynskey, M 2001, 'Alcohol, cannabis and tobacco use among Australians: a comparison of their associations with other drug use and use disorders, affective and anxiety disorders, and psychosis', *Addiction*, vol. 96, pp. 1603–14.

- Department of Family and Community Services 2002, *FaCS Submission to the House of Representatives Standing Committee on Ageing: Inquiry into long-term strategies to address the ageing of the Australian population over the next 40 years*, FaCS, Canberra.
- Derr, MK, Douglas, S & Pavetti, L 2001, *Providing mental health services to TANF recipients: program design choices and implementation challenges in four states*, Mathematica Policy Research, Washington, DC.
- Derr, MK, Hill, H & Pavetti, L 2000, *Addressing mental health problems among TANF Recipients: a Guide for Program Administrators. Final Report*, MPR Ref. No. 8528-100, Mathematica Policy Research, Washington, DC.
- Diekhoff, G 1992, *Statistics for the social and behavioral sciences: univariate, bivariate, multivariate*, Wm C Brown, Dubuque, IA.
- Dijker, A & Koomen, W 2006, 'A psychological model of social control and stigmatization: evolutionary background and practical implications', *Psychology, Health & Medicine*, vol. 11, pp. 296–306.
- Doll, R, Peto, R, Boreham, J & Sutherland, I 2005, 'Mortality in relation to alcohol consumption: a prospective study among male British doctors', *International Journal of Epidemiology*, vol. 34, pp. 199–204.
- Donovan, JE & Jessor, R 1983, 'Problem drinking and the dimension of involvement with drugs: a Guttman scalogram analysis of adolescent drug use', *American Journal of Public Health*, vol. 73, pp. 543–52.
- Dooley, D, Fielding, J & Levi, L 1996, 'Health and unemployment', *Annual Review of Public Health*, vol. 17, pp. 449–65.
- Drake, RE, Barttels, SJ, Teague, GR, Nordsby, DL & Clark, RE 1993, 'Treatment of substance abuse in severely mentally ill patients', *Journal of Nervous Mental Disorders*, vol. 181, pp. 606–11.
- Droes, RM, Breebaart, E, Meiland, FJ, Van Tilburg, W & Mellenbergh, GJ 2004, 'Effect of Meeting Centres Support Program on feelings of competence of family carers and delay of institutionalization of people with dementia', *Aging & Mental Health*, vol. 8, pp. 201–11.
- Eckersley, R 1999, 'Dreams and expectations: young people's expected and preferred futures and their significance for education', *Futures*, vol. 31, pp. 73–90.
- Edwards, M 2004, *Social science research and public policy: narrowing the divide*, Academy of the Social Sciences, Canberra.
- Eggleston, E, Wong, EL, Hardee, K, Irwanto, Poerwandari, EK & Severy, LJ 2001, 'Measuring women's psychological well-being in Indonesia', *Women & Health*, vol. 32, pp. 617–26.
- Eisemann, M 1984, 'The availability of confiding persons for depressed patients', *Acta Psychiatrica Scandinavica*, vol. 70, pp. 166–69.
- Elder, GH 1994, 'Time, human agency, and social change: perspectives on the life course', *Social Psychology Quarterly*, vol. 57, pp. 4–15.
- Elias, MJ & Weissberg, RP 2000, 'Primary prevention: educational approaches to enhance social and emotional learning', *Journal of School Health*, vol. 70, pp. 186–90.
- Emmons, RA 1992, 'The repressive personality and social support' in HS Friedman (ed.), *Hostility, coping, and health*, American Psychological Association, Washington, DC, pp. 141–50.
- Feather, NT 1995, 'Values, valences, and choice: the influence of values on the perceived attractiveness and choice of alternatives', *Journal of Personality and Social Psychology*, vol. 68, pp. 1135–51.
- — 1997, 'Economic deprivation and the psychological impact of unemployment', *Australian Psychologist*, vol. 32, pp. 37–45.

- Flatau, P, Galea, J & Petrides, R 2000, 'Mental health and wellbeing and unemployment', *Australian Economic Review*, vol. 33, pp. 161–81.
- Forster, M & d'Ercole, MM 2005, *Income distribution and poverty in OECD countries in the second half of the 1990s*, Report 22, OECD, Paris.
- Fryer, D 1999, 'For better or worse? Interventions and mental health consequences of unemployment', *International Archives of Occupational and Environmental Health*, vol. 72, pp. S34–37.
- Furstenberg, FF, Levine, JA & Brooks-Gunn, J 1990, 'The children of teenage mothers: patterns of early childbearing in two generations', *Family Planning Perspectives*, vol. 22, pp. 54–61.
- Gannon, N & Ranzijn, R 2005, 'Does emotional intelligence predict unique variance in life satisfaction beyond IQ and personality?', *Personality and Individual Differences*, vol. 38, pp. 1353–64.
- Gattuso, S, Fullagar, S & Young, I 2005. 'Speaking of women's "nameless misery": the everyday construction of depression in Australian women's magazines', *Social Science & Medicine*, vol. 61, pp. 1640–48.
- Gilman, SE, Kawachi, I, Fitzmaurice, GM & Buka, L 2003, 'Socio-economic status, family disruption and residential stability in childhood: relation to onset, recurrence and remission of major depression', *Psychological Medicine*, vol. 33, pp. 1341–55.
- Hagenaars, A, de Vos, K & Zaidi, MA 1994, *Poverty statistics in the late 1980s: research based on micro-data*, Office for Official Publications of the European Communities, Luxembourg.
- Hall, W, Teesson, M, Lynskey, M & Degenhardt, L 1998, *The prevalence in the past year of substance use and ICD-10 substance use disorders in Australian adults: findings from the National Survey of Mental Health and Well-being*, Technical Report No. 63, National Drug and Alcohol Research Centre, Sydney.
- Hao, L & Johnson, RW 2000, 'Economic, cultural, and social origins of emotional well-being: comparisons of immigrants and natives at midlife', *Research on Aging*, vol. 22, pp. 599–629.
- Headey, B, Marks, GN & Wooden, M 2005, 'The structure and distribution of household wealth in Australia', *The Australian Economic Review*, vol. 38, p. 159
- Helzer, JE & Pryzbeck, TR 1988, 'The co-occurrence of alcoholism with other psychiatric disorders in the general population and its impact on treatment', *Journal of Studies on Alcohol*, vol. 49, pp. 219–24.
- Hendry, LB & Reid, M 2000, 'Social relationships and health: the meaning of social "connectedness" and how it relates to health concerns for rural Scottish adolescents', *Journal of Adolescence*, vol. 23, pp. 705–19.
- Herrman, H 2001, 'The need for mental health promotion', *Australian and New Zealand Journal of Psychiatry*, vol. 35, no. 6, pp. 709–15.
- Hickie, I 2002, 'Responding to the Australian experience of depression. Promotion of the direct voice of consumers is critical for reducing stigma', *Medical Journal of Australia*, vol. 176, pp. S61–62.
- Highet, NJ, McNair, BG, Davenport, TA & Hickie, IB 2004, 'How much more can we lose? Carer and family perspectives on living with a person with depression', *Medical Journal of Australia*, vol. 181, pp. S6–9.
- Hillman, KJ & Marks, GN 2002, *Becoming an adult: leaving home, relationships and home ownership among Australian youth*, ACER: The Australian Council for Educational Research Ltd, Camberwell, Victoria.
- Hinshaw, SP 2004, 'Parental mental disorder and children's functioning: silence and communication, stigma and resilience', *Journal of Clinical Child & Adolescent Psychology*, vol. 33, pp. 400–11.
- Hitlin, S & Piliavin, JA 2004, 'Values: reviving a dormant concept', *Annual Review of Sociology*, vol. 30, pp. 359–93.

- 
- Homish, GG & Leonard, KE 2005, 'Spousal influence on smoking behaviors in a US community sample of newly married couples', *Social Science & Medicine*, vol. 61, pp. 2557–67.
- Hope, S, Power, C & Rodgers, B 1999, 'Does financial hardship account for elevated psychological distress in lone mothers?', *Social Science and Medicine*, vol. 49, pp. 1637–49.
- Hope, S, Rodgers, B & Power, C 1999, 'Marital status transitions and psychological distress: longitudinal evidence from a national population sample', *Psychological Medicine*, vol. 29, pp. 381–89.
- Hunter, B 1995, 'The social structure of the Australian urban labour market: 1976–1991', *The Australian Economic Review*, no. 110, 2nd quarter, pp. 65–79.
- Huriwai, T, Sellman, JD, Sullivan, P & Potiki, TL 2000, 'Optimal treatment for Maori with alcohol and drug-use-related problems: an investigation of cultural factors in treatment', *Substance Use & Misuse*, vol. 35, pp. 281–300.
- Idler, EL & Benyamini, Y 1997, 'Self-rated health and mortality: a review of twenty-seven community studies', *Journal of Health and Social Behavior*, vol. 38, pp. 21–37.
- Isaacowitz, DM & Seligman, MEP 2002, 'Cognitive style predictors of affect change in older adults', *International Journal of Aging and Human Development*, vol. 54, pp. 233–53.
- Jackson, J 2005, 'Validating new measures of the fear of crime', *International Journal of Social Research Methodology*, vol. 8, pp. 297–315.
- Jamison, KR 2006, 'The many stigmas of mental illness', *The Lancet*, vol. 367, pp. 533–34.
- Jayakody, R & Stauffer, D 2000, 'Mental health problems among single mothers: implications for work and welfare reform', *Journal of Social Issues*, vol. 56, pp. 617–34.
- Johnsen, MC, Morrissey, JP, Calloway, MO, Fried, BJ, Blank, M & Starrett, BE 1997, 'Rural mental health leaders' perceptions of stigma and community issues', *Journal of Rural Health*, vol. 13, pp. 59–70.
- Kai, J & Crosland, A 2001, 'Perspectives of people with enduring mental ill health from a community-based qualitative study', *British Journal of General Practice*, vol. 51, pp. 730–36.
- Kalil, A, Born, CE, Kunz, J & Caudill, PJ 2001, 'Life stressors, social support, and depressive symptoms among first-time welfare recipients', *American Journal of Community Psychology*, vol. 29, pp. 355–69.
- Kalil, A, Schweingruber, HA & Seefeldt, KS 2001, 'Correlates of employment among welfare recipients: do psychological characteristics and attitudes matter?', *American Journal of Community Psychology*, vol. 29, pp. 701–23.
- Kalter, N 1987, 'Long-term effects of divorce on children: a developmental vulnerability model', *American Journal of Orthopsychiatry*, vol. 57, pp. 587–600.
- Katz, LF & Low, SM 2004, 'Marital violence, co-parenting, and family-level processes in relation to children's adjustment', *Journal of Family Psychology*, vol. 18, pp. 372–82.
- Kawachi, I & Berkman, LF 2001, 'Social ties and mental health', *Journal of Urban Health-Bulletin of the New York Academy of Medicine*, vol. 78, pp. 458–67.
- Kessler, RC 2000, 'Psychiatric epidemiology: selected recent advances and future directions', *Bulletin of the World Health Organization*, vol. 78, pp. 464–74.
- Kessler, RC, McGonagle, KA, Zhao, S, Nelson, CB, Hughes, M, Eshelman, S, Wittchen, H-U & Kendler, KS 1994, 'Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States', *Archives of General Psychiatry*, vol. 51, pp. 8–19.
-

- Keusch, GT, Wilentz, J & Kleinman, A 2006, 'Stigma and global health: developing a research agenda', *The Lancet*, vol. 367, pp. 525–27.
- Kilic, EZ, Ozguven, HD & Sayil, I 2003, 'The psychological effects of parental mental health on children experiencing disaster: the experience of Bolu earthquake in Turkey', *Family Process*, vol. 42, pp. 485–95.
- Kovess, V, Gysens, S, Poinard, R, Chanoit, PF & Labarte, S 1999, 'Mental health and use of care in people receiving a French social benefit', *Social Psychiatry and Psychiatric Epidemiology*, vol. 34, pp. 588–94.
- Krabbendam, L & van Os, J 2005, 'Schizophrenia and urbanicity: a major environmental influence—conditional on genetic risk', *Schizophrenia Bulletin*, vol. 31, pp. 795–99.
- Lance, GN & Williams, WT 1967, 'A general theory of classificatory sorting strategies. I. Hierarchical systems', *Computer Journal*, vol. 9, pp. 373–80.
- Langsford, S, Houghton, S, Douglas, G & Whiting, K 2001, 'Prevalence and comorbidity of child and adolescent disorders in Western Australian mainstream school students', *The International Forum for Psychiatry*, vol. 8, pp. 1–7.
- Laudet, AB, Magura, S, Vogel, HS & Knight, EL 2002, 'Interest in and obstacles to pursuing work among unemployed dually diagnosed individuals', *Substance Use & Misuse*, vol. 37, pp. 145–70.
- Lee, RM, Draper, M & Lee, S 2001, 'Social connectedness, dysfunctional interpersonal behaviors, and psychological distress: testing a mediator model', *Journal of Counseling Psychology*, vol. 48, pp. 310–18.
- Lennon, MC, Blome, J & English, K 2001, *Depression and low-income women: challenges for TANF and welfare-to-work policies and programs*, National Center for Children in Poverty, New York.
- Levendosky, AA & Graham-Bermann, SA 2001, 'Parenting in battered women: the effects of domestic violence on women and their children', *Journal of Family Violence*, vol. 16, pp. 171–92.
- Lewis, MA, McBride, CM, Pollak, KI, Puleo, E, Butterfield, RM & Emmons, KM 2006, 'Understanding health behavior change among couples: an interdependence and communal coping approach', *Social Science & Medicine*, vol. 62, pp. 1369–80.
- Lindstrom, M 2005, 'Ethnic differences in social participation and social capital in Malmo, Sweden: a population-based study', *Social Science & Medicine*, vol. 60, pp. 1527–46.
- Link, BG & Phelan, JC 2006, 'Stigma and its public health implications', *The Lancet*, vol. 367, pp. 528–29.
- Loprest, PJ & Zedlewski, SR 1999, 'Current and former welfare recipients: how do they differ?', in *Assessing the New Federalism. An Urban Institute program to assess changing social policies*, Urban Institute, Washington DC.
- Lundberg, S & Pollak, R 1996, 'Bargaining and distribution in marriage', *Journal of Economic Perspectives*, vol. 10, pp. 139–58.
- Madianos, M, Madianou, D, Vlachonikolis, J & Stefanis, C 1987, 'Attitudes towards mental illness in the Athens area: implications for community mental health intervention', *Acta Psychiatrica Scandinavica*, vol. 75, pp. 158–65.
- Major, B & Brien, LT 2005, 'The social psychology of stigma', *Annual Review of Psychology*, vol. 56, pp. 393–421.
- Manlove, J 1998, 'The influence of high school dropout and school disengagement on the risk of school-age pregnancy', *Journal of Research on Adolescence*, vol. 8, pp. 187–220.
- Mathers, CD & Schofield, DJ 1998, 'The health consequences of unemployment: the evidence', *Medical Journal of Australia*, vol. 168, 178–82.

- Mathers, C, Vos, T & Stevenson, C 1999, *The burden of disease and injury in Australia*, Australian Institute of Health and Welfare, Canberra.
- Mayer, JD & Geher, G 1996, 'Emotional intelligence and the identification of emotion', *Intelligence*, vol. 22, pp. 89–113.
- McKay, W, Maclean, W & Bourgeois, M 2002, 'Cluster analysis of maternal characteristics and perceptions of child behavior problems in a behavioral pediatrics practice', *Journal of Developmental & Behavioral Pediatrics*, vol. 23, pp. 31–36.
- McLelland, AT, Luborsky, L, Woody, GE, O'Brien, CP & Druley, KA 1983, 'Predicting response to alcohol and drug abuse treatments', *Archives of General Psychiatry*, vol. 40, pp. 620–25.
- McMillan, J & Marks, GN 2003, *School leavers in Australia: profiles and pathways*, ACER: The Australian Council for Educational Research Ltd, Camberwell, Victoria.
- Merikangas, KR 1984, 'Divorce and assortative mating among depressed patients', *American Journal of Psychiatry*, vol. 141, pp. 74–76.
- Michael, YL, Berkman, LF, Colditz, GA & Kawachi, I 2001, 'Living arrangements, social integration, and change in functional health status', *American Journal of Epidemiology*, vol. 153, pp. 123–31.
- Michels, KM, Hofman, KJ, Keusch, GT & Hrynokow, SH 2006, 'Stigma and global health: looking forward', *The Lancet*, vol. 367, pp. 538–39.
- Miller, AE 2005, 'State health policy making determinants, theory, and methods: a synthesis', *Social Science & Medicine*, vol. 61, pp. 2639–57.
- Miller, BC, Benson, B & Galbraith, KA 2001, 'Family relationships and adolescent pregnancy risk: a research synthesis', *Developmental Review*, vol. 21, pp. 1–38.
- Ministerial Council on Drug Strategy 2001, *National Action Plan on Illicit Drugs, Background Paper 2001–2002/03*, Commonwealth Department of Health and Aged Care, Canberra.
- Moffit, R & Cherlin, A 2002, *Disadvantage among families remaining on welfare*, John Hopkins University, Baltimore.
- Mood, C 2006, 'Take-up Down Under: hits and misses of means-tested benefits in Australia', *European Sociological Review*, vol. 22, pp. 443–58.
- Moore, DJ, Atkinson, JH, Akiskal, H, Gonzalez, R, Wolfson, T & Grant, I 2005, 'Temperament and risky behaviors: a pathway to HIV?', *Journal of Affective Disorders*, vol. 85, pp. 191–200.
- Moore, KA, Zaslow, MJ, Coiro, MJ, Miller, SM & Magenheimer, E 1995, *How well do they fare? AFDC families with preschool children in Atlanta at the outset of the JOBS evaluation*, US Department of Health and Human Services and US Department of Education, Washington DC.
- Mueller, B, Nordt, C, Lauber, C, Rueesch, P, Meyer, PC & Roessler, W 2006, 'Social support modifies perceived stigmatization in the first years of mental illness: a longitudinal approach', *Social Science & Medicine*, vol. 62, pp. 39–49.
- Murphy, GC & Athanasou, JA 1999, 'The effect of unemployment on mental health', *Journal of Occupational and Organizational Psychology*, vol. 72, pp. 83–99.
- Murphy, H & Murphy, E 2006, 'Comparing quality of life using the World Health Organization Quality of Life measure (WHOQOL-100) in a clinical and non-clinical sample: exploring the role of self-esteem, self-efficacy and social functioning', *Journal of Mental Health*, vol. 15, pp. 289–300.

- Nangle, DW, Erdley, CA, Newman, JE, Mason, CA & Carpenter, EM 2003, 'Popularity, friendship quantity, and friendship quality: interactive influences on children's loneliness and depression', *Journal of Clinical Child & Adolescent Psychology*, vol. 32, pp. 546–55.
- Nelson, SH 2002, 'Role of social disadvantage in crime, joblessness, and homelessness among persons with serious mental illness: comment', *Psychiatric Services*, vol. 53, pp. 899–900.
- Newcomb, M 1996, 'Pseudomaturity among adolescents: construct validation, sex differences, and associations in adulthood', *Journal of Drug Issues*, vol. 26, pp. 477–504.
- Newman, DL, Moffitt, TE, Caspi, A & Silva, PA 1998, 'Comorbid mental disorders: implications for treatment and sample selection', *Journal of Abnormal Psychology*, vol. 107, pp. 305–11.
- Nystedt, P 2006, 'Martial life course events and smoking behaviour in Sweden 1980–2000', *Social Science & Medicine*, vol. 62, pp. 1427–42.
- Olson, K & Pavetti, L 1996, *Personal and family challenges to the successful transition from welfare to work*, Urban Institute, Washington DC.
- O'Neil, MK, Lancee, WJ & Freeman, SJJ 1984, 'Help-seeking behavior of depressed students', *Social Science and Medicine*, vol. 18, pp. 511–14.
- Pajari, PM, Jallinoja, P & Absetz, P 2006, 'Negotiation over self-control and activity: an analysis of balancing in the repertoires of Finnish healthy lifestyles', *Social Science & Medicine*, vol. 62, pp. 2601–11.
- Petterson, SM & Friel, LV 2001, 'Psychological distress, hopelessness and welfare', *Women & health*, vol. 32, pp. 79–99.
- Pevalin, DJ & Goldberg, DP 2003, 'Social precursors to onset and recovery from episodes of common mental illness', *Psychological Medicine*, vol. 33, pp. 299–306.
- Phelan, J, Link, B, Stueve, A & Pescosolido, B 2000, 'Public conceptions of mental illness in 1950 and 1996: what is mental illness and is it to be feared?', *Journal of Health and Social Behavior*, vol. 41, pp. 188–207.
- Pollak, RA 2004, 'An intergenerational model of domestic violence', *Journal of Population Economics*, vol. 17, pp. 311–29.
- Poulton, RG & Andrews, G 1992, 'Personality as a cause of adverse life events', *Acta Psychiatrica Scandinavica*, vol. 85, pp. 35–38.
- Power, C, Rodgers, B & Hope, S 1999, 'Heavy alcohol consumption and marital status: disentangling the relationship in a national study of young adults', *Addiction*, vol. 94, pp. 1477–87.
- Prince, M, Harwood, R, Thomas, A & Mann, A 1998, 'A prospective population-based cohort study of the effects of disablement and social milieu on the onset and maintenance of late-life depression. The Gospel Oak Project VII', *Psychological Medicine*, vol. 28, pp. 337–50.
- Pryor, J & Rodgers, B 2001, *Children in changing families: life after parental separation*, Blackwell, Oxford.
- Purvin, DM 2003, 'Weaving a tangled safety net—the intergenerational legacy of domestic violence and poverty', *Violence against Women*, vol. 9, pp. 1263–77.
- Putnam, RD 2000, *Bowling alone: the collapse and revival of American community*, Simon & Schuster, New York.
- Rahav, M, Streuning, E & Andrews, H 1984, 'Opinions on mental illness in Israel', *Social Science and Medicine*, vol. 19, pp. 1151–58.

- Real, R, Pleguezuelos, JM & Fahd, S 1997, 'The distribution patterns of reptiles in the Riff region, northern Morocco', *African Journal of Ecology*, vol. 35, pp. 312–25.
- Resnick, MD, Bearman, PS, Blum, RW, Bauman, KE, Harris, KM, Jones, J, Tabor, J, Beuhring, T, Sieving, RE, Shew, M, Ireland, M, Bearinger, LH & Udry, JR 1997 'Protecting adolescents from harm: findings from the National Longitudinal Study on Adolescent Health', *Journal of the American Medical Association*, vol. 278, pp. 823–32.
- Riise, T & Lund, A 2001, 'Prognostic factors in major depression: a long-term follow-up study of 323 patients', *Journal of Affective Disorders*, vol. 65, pp. 297–306.
- Ritsher, JB, Otilingam, PG & Grajales, M 2003, 'Internalized stigma of mental illness: psychometric properties of a new measure', *Psychiatry Research*, vol. 121, pp. 31–49.
- Robins, LN, Locke, BZ & Regier, DA 1991, 'An overview of psychiatric disorders in America', in LN Robins & DA Regier (eds), *Psychiatric disorders in America: the Epidemiologic Catchment Area study*, pp. 328–66, Free Press, New York.
- Rodgers, B 1995, 'Separation, divorce and mental health', in AF Jorm (ed.), *Men and mental health*, pp. 105–15, National Health and Medical Research Council, Canberra.
- — 1996a, 'Reported parental behaviour and adult affective symptoms. 1. Associations and moderating factors', *Psychological Medicine*, vol. 26, pp. 51–61.
- — 1996b, 'Reported parental behaviour and adult affective symptoms. 2. Mediating factors', *Psychological Medicine*, vol. 26, pp. 63–77.
- Rodgers, B, Gray, P, Caldwell, TM, Butterworth, P & Berry, HL 2006, *Parental divorce and adult family, social and psychological outcomes: the contribution of childhood family adversity*, Australian National University, Canberra.
- Rodgers, B & Pryor, J 1998, *Divorce and separation: the outcomes for children*, Joseph Rowntree Foundation, York.
- Rodgers, B, Smyth, BM & Robinson, E 2004, 'Mental health and the family law system', *Journal of Family Studies*, vol. 10, pp. 50–70.
- Romito, P, Crisma, M & Saurel-Cubizolles, MJ 2003, 'Adult outcomes in women who experienced parental violence during childhood', *Child Abuse & Neglect*, vol. 27, pp. 1127–44.
- Romito, P, Molzan Turan, J & De Marchi, M 2005, 'The impact of current and past interpersonal violence on women's mental health', *Social Science & Medicine*, vol. 60, pp. 1717–27.
- Rubin, WV & Panzano, PC 2002, 'Identifying meaningful subgroups of adults with severe mental illness', *Psychiatric Services*, vol. 53, pp. 452–57.
- Rutter, M & Smith, DJ 1995, *Psychosocial disorders in young people: time trends and their causes*, published for Academia Europaea by J Wiley, New York.
- San Jose, B, Van Oers, JAM, Van de Mheen, H, Garretsen, HFL & Mackenbach, JP 2000, 'Drinking patterns and health outcomes: occasional versus regular drinking', *Addiction*, vol. 95, p. 865–72.
- Sarason, IG & Sarason, BR 1982, 'Concomitants of social support: attitudes, personality characteristics, and life experiences', *Journal of Personality*, vol. 50, pp. 331–44.
- Sartorius, N 2001, 'The economic and social burden of depression', *Journal of Clinical Psychiatry*, vol. 62, pp. 8–11.
- Scambler, G 2006, 'Sociology, social structure and health-related stigma', *Psychology, Health & Medicine*, vol. 11, pp. 288–95.

- Scheier, MF, Carver, CS & Bridges, MW 1994, 'Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the Life Orientation Test', *Journal of Personality and Social Psychology*, vol. 67, p. 1063.
- Schwarz, SH 1992, 'Universals in the content and structure of values: theoretical advances and empirical tests', in MP Zanna (ed.), *Advances in experimental social psychology*, pp. 1–65, Academic, San Diego, CA.
- Schwarzinger, M, Stouthard, M, Burstrom, K & Nord, E 2003, 'Cross-national agreement on disability weights: the European Disability Weights Project', *Population Health Metrics*, vol. 1, p. 9.
- Seeman, TE & Berkman, LF 1988, 'Structural characteristics of social networks and their relationship with social support in the elderly: who provides support', *Social Science & Medicine*, vol. 26, pp. 737–49.
- Seginer, R 2000, 'Defensive pessimism and optimism correlates of adolescent future orientation: a domain-specific analysis', *Journal of Adolescent Research*, vol. 15, pp. 307–26.
- Shaw, M, Lawlor, DA & Najman, JM 2006, 'Teenage children of teenage mothers: psychological, behavioural and health outcomes from an Australian prospective longitudinal study', *Social Science & Medicine*, vol. 62, pp. 2526–39.
- Singh-Manoux, A, Ferrie, JE, Chandola, T & Marmot, M 2004, 'Socioeconomic trajectories across the life course and health outcomes in midlife: evidence for the accumulation hypothesis?', *International Journal of Epidemiology*, vol. 33, pp. 1072–79.
- Skrabski, A, Kopp, M & Kawachi, I 2003, 'Social capital in a changing society: cross sectional associations with middle aged female and male mortality rates', *Journal of Epidemiology and Community Health*, vol. 57, pp. 114–19.
- Smith, C 1981, 'Residential proximity and community acceptance of the mentally ill', *Journal of Operational Psychiatry*, vol. 12, pp. 2–12.
- Song, L-Y & Singer, M 2001, 'The social functioning of persons with chronic mental illness: an empirical typology of consumers and correlates of social functioning', *International Journal of Social Psychiatry*, vol. 47, pp. 36–55.
- Spooner, C & Hetherington, K 2004, *Social determinants of drug use*, Technical Report Number 228, National Drug and Alcohol Research Centre, University of New South Wales, Sydney.
- Stein, JA, Newcomb, M-D & Bentler, PM 1987, 'An 8-year study of multiple influences on drug use and drug use consequences', *Journal of Personality and Social Psychology*, vol. 53, pp. 1094–105.
- Stein, JA, Newcomb, M-D & Bentler, PM 1988, 'Structure of drug use behaviours and consequences among young adults: multitrait-multimethod assessment of frequency, quantity, work site, and problem substance use', *Journal of Applied Psychology*, vol. 73, pp. 595–605.
- Stewart, DG & Trupin, EW 2003, 'Clinical utility and policy implications of a statewide mental health screening process for juvenile offenders', *Psychiatric Services*, vol. 54, pp. 377–82.
- Stith, SM, Rosen, KH, Middleton, KA, Busch, AL, Lundeborg, K & Carlton, RP 2000, 'The intergenerational transmission of spouse abuse: a meta-analysis', *Journal of Marriage and the Family*, vol. 62, pp. 640–54.
- Stoduto, G & Adlaf, EM 2001, 'A typology of adolescent drinking-drivers', *Journal of Child & Adolescent Substance Abuse*, vol. 10, pp. 43–58.
- Sweeney, P & Kisely, S 2003, 'Barriers to managing mental health in Western Australia', *Australian Journal of Rural Health*, vol. 11, pp. 205–10.
- Targosz, S, Bebbington, P, Lewis, G, Brugha, T, Jenkins, R, Farrell, M & Meltzer, H 2003, 'Lone mothers, social exclusion and depression', *Psychological Medicine*, vol. 33, pp. 715–22.

- Thornton, K & Tuck, I 2000, 'Promoting the mental health of elderly African Americans: a case illustration', *Archives of Psychiatric Nursing*, vol. 14, pp. 191–98.
- Tolan, P, Gorman-Smith, D & Henry, D 2006, 'Family violence', *Annual Review of Psychology*, vol. 57, pp. 557–83.
- Tomakowsky, J, Lumley, MA, Markowitz, N & Frank, C 2001, 'Optimistic explanatory style and dispositional optimism in HIV-infected men', *Journal of Psychosomatic Research*, vol. 51, pp. 577–87.
- Tong, EMW, Bishop, GD, Diong, SM, Enkelmann, HC, Why, YP, Ang, J & Khader, M 2004, 'Social support and personality among male police officers in Singapore', *Personality & Individual Differences*, vol. 36, pp. 109–23.
- Turner, RJ, Wheaton, B & Lloyd, DA 1995, 'The epidemiology of social stress', *American Sociological Review*, vol. 60, pp. 104–25.
- Turrell, G, Kavanagh, A & Subramanian, SV 2005, 'Area variation in mortality in Tasmania (Australia): the contributions of socioeconomic disadvantage, social capital and geographic remoteness', *Health & Place*, in press (corrected proof).
- Twenge, JM 2000, 'The age of anxiety? Birth cohort change in anxiety and neuroticism, 1952–1993', *Journal of Personality & Social Psychology*, vol. 79, pp. 1007–21.
- Tylee, A 2001, 'Major depressive disorder (MDD) from the patient's perspective: overcoming barriers to appropriate care', *International Journal of Psychiatry in Clinical Practice*, vol. 5, pp. 37–42.
- Tylee, A, Gastpar, M, Lepine, JP & Mendlewicz, J 1999, 'Identification of depressed patient types in the community and their treatment needs: findings from the DEPRES II (Depression Research in European Society II) survey', *International Clinical Psychopharmacology*, vol. 14, pp. 153–65.
- VicHealth 2005, *Tobacco retail prices*, VicHealth Centre for Tobacco Control.
- Wainer, J & Chesters, J 2000, 'Rural mental health: neither romanticism nor despair', *Australian Journal of Rural Health*, vol. 8, pp. 141–47.
- Wannamethee, SG & Shaper, AG 1997, 'Lifelong teetotallers, ex-drinkers and drinkers: mortality and the incidence of major coronary heart disease events in middle-aged British men', *International Journal of Epidemiology*, vol. 26, pp. 523–31.
- Ware, JE, Snow, KK, Kosinski, MA & Gandek, MS 1993, *SF-36 health survey manual and interpretation guide*, The Health Institute, New England Medical Centre, Boston.
- Winefield, HR, Goldney, RD, Winefield, AH & Tiggemann, M 1992, 'Psychological correlates of the level of alcohol consumption in young adults', *Medical Journal of Australia*, vol. 156, pp. 755–59.
- Wooden, M, Freidin, S & Watson, N 2002, 'The Household, Income and Labour Dynamics in Australia (HILDA) Survey: Wave 1', *The Australian Economic Review*, vol. 35, pp. 339–48.
- World Health Organization 2001, *The world health report 2001—mental health: new understanding, new hope*, World Health Organization, Geneva.



# Social Policy Research Papers

- 1 *The Australian system of social protection—an overview*  
Peter Whiteford (February 2000)
- 2 *Parents, the labour force and social security*  
Karen Wilson, Jocelyn Pech and Kylee Bates (1999)
- 3 *Estimates of the costs of children in Australian families, 1993–94*  
National Centre for Social and Economic Modelling (March 1999)
- 4 *Social policy directions across the OECD region: reflections on a decade*  
David W Kalisch (February 2000)
- 5 *Structural ageing, labour market adjustment and the tax/transfer system*  
David Ingles (May 2000)
- 6 *Trends in the incomes and living standards of older people in Australia*  
Peter Whiteford and Kim Bond (November 2000)
- 7 *Updating Australian budget standards costs of children estimates*  
Paul Henman and Macquarie University (January 2001)
- 8 *Social indicators for regional Australia*  
J. Rob Bray (January 2001)
- 9 *Means-tested benefits, incentives and earnings distributions*  
John Creedy and Rosanna Scutella (January 2001)
- 10 *The duration of unemployment benefit spells: a comparison of Indigenous and non-Indigenous persons*  
Thorsten Stromback and Mike Dockery (June 2001)
- 11 *A meta-analysis of the impact of community-based prevention and early intervention action*  
Erin Gauntlett, Richard Hugman, Peter Kenyon and Pauline Logan (June 2001)
- 12 *How do income support recipients engage with the labour market?*  
Paul Flatau and Mike Dockery (June 2001)
- 13 *The policy-maker's guide to population ageing: key concepts and issues*  
Natalie Jackson (June 2001)
- 14 *The dynamics of participating in Parenting Payment (Single) and the Sole Parent Pension*  
Garry Barrett (July 2001)
- 15 *Jobs in a new labour market: changes in type and distribution*  
Alan Jordan (August 2001)
- 16 *Cost-benefit analysis of portability policy*  
Kruno Kukoc and Norbert Zmijewski (October 2001)
- 17 *Some issues in home ownership*  
William Mudd, Habtemariam Tesfaghiorghis and J Rob Bray (October 2001)
- 18 *The impact of social policy initiatives on labour supply incentives: a review of the literature*  
Guyonne Kalb (February 2003)

- 19 *Patterns of economic and social participation among FaCS customers*  
Peter Saunders, Judith Brown and Tony Eardley (April 2003)
- 20 *Child poverty: a review*  
Bruce Bradbury (November 2003)
- 21 *Estimating the prevalence of mental disorders among income support recipients: approach, validity and findings*  
Peter Butterworth (October 2003)
- 22 *Men's uptake of family-friendly employment provisions*  
Michael Bittman, Sonia Hoffman and Denise Thompson (April 2004)
- 23 *Household monies and decision-making*  
Saba Waseem (June 2004)
- 24 *Understanding and improving data quality relating to low-income households*  
David Johnson and Rosanna Scutella (April 2005)
- 25 *Effects of child care demands and policies on household labour supply in Australia*  
Denise Doiron and Guyonne Kalb (September 2005)
- 26 *Communities, social capital and public policy: literature review*  
David Johnson, Bruce Headey and Ben Jensen (September 2005)
- 27 *The causes of changes in the distribution of family income in Australia, 1982 to 1997-98*  
David Johnson and Roger Wilkins (March 2006)
- 28 *Exploring the economic and social value of present patterns of volunteering in Australia*  
Michael Bittman and Kimberly Fisher (September 2006)
- 29 *Income poverty, subjective poverty and financial stress*  
Gary N Marks (June 2007)
- 30 *Mothers and fathers with young children: paid employment, caring and wellbeing*  
Jennifer Baxter, Matthew Gray, Michael Alexander, Lyndall Strazdins and Michael Bittman (July 2007)
- 31 *Intergenerational reliance on income support: psychosocial factors and their measurement*  
Helen Berry, Emma George, Peter Butterworth, Bryan Rodgers and Tanya Caldwell (July 2007)



