Child Ind Res (2012) 5:179–198
DOI 10.1007/s12187-011-9122-6

Capacity for Freedom—A New Way of Measuring Poverty Amongst Australian Children

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Accepted: 4 September 2011 / Published online: 16 September 2011

Abstract A little over 200 000 children and youths in Australia between the ages of 5 and 19 years were in Freedom poverty in 2003—they had low family income, and either poor health or an insufficient level of education. These individuals are some of the most disadvantaged in society due to their multiple capability restrictions. Current political rhetoric focused on increasing the education opportunities of children and youth to maximise their labour force participation in the future and thus improve their living standards may offer a means of improving the lives of these most disadvantaged children. However, half of these children have poor health and this may act as a barrier to their future labour force participation. It is shown that when looking at the health, education and labour force status of adults, amongst those with and without a disability those with a higher education had a greater likelihood of participating in the labour force—indicating policies to promote education amongst children are justified. However, it was also shown that regardless of education attainment those with a disability still had lower labour force participation rates than those without a disability. As such, efforts to increase children's future labour force participation rates as a means of improving their living standards should also focus on improving childhood health, as well as education. Political promises to improve the lives of children should take a holistic view of the lives of individuals taking note in particular of how health may be restraining their quality of life.

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Keywords Poverty · Health · Education · Income · Capability

1 Introduction

The experience of poverty during childhood may have lifelong impacts and as such is an important social issue. Children raised in poverty often have less chance of completing school, greater chance of having their own children outside marriage, and lower employment opportunities and economic resources as adults (Community Affairs Reference Committee 2004; Mayer 1997; Duncan et al. 1998). These long term effects of childhood poverty are a key reason why it is studied, along with children making up a large proportion of the population so being an important component of looking at poverty within a country (Bradbury 2003).

Studies have shown that Australia has a high rate of childhood poverty compared to other countries (Corak 2005; Bradbury and Jantti 1999). Recent child poverty measurement conducted by the United Nation's Children Fund estimated that 11.6% of Australian children live in poverty– far higher than the figures for OECD-leaders in child poverty, Denmark and Finland which have only 2.4% and 3.4% of children living in poverty respectively (UNICEF 2007).

Most studies of childhood poverty only look at the economic aspects of a child's living standards. This is in spite of the fact that studies recognise that poverty should measure living standards, and economic resources make up only one dimension of living standards (Bradbury 2003). The 'Freedom Poverty Measure' proposes a multidimensional measure of poverty that includes economic resources, health and education, and has been designed to be applied to the Australian population. Inspired by the capabilities approach pioneered by Amartya Sen (Sen 1999) and utilising a process for construction that is inspired by the Alkire Foster (Alkire and Foster 2011a) method of constructing a multidimensional poverty measure, this poverty measure looks at other dimensions of living standards, not just income. Looking at health and education as well as income provides a more complete picture of the living standards available to individuals to determine whether or not they are in poverty.

The freedom poverty measure will be used in this paper to analyse in detail the varying levels of disadvantage—poor health and insufficient education attainment—amongst children and youths (5 to 19 year olds) in income poverty in Australia. It will identify those in Freedom poverty (those who have relatively low family income, poor health and/or insufficient education attainment), extreme Freedom poverty (those who have relatively low family income, poor health and insufficient education attainment), and those at risk of freedom poverty (those who are relatively economically advantaged and have higher family income, but have poor health or an insufficient level of education), as well as their general demographic characteristics.

The children in Freedom poverty are seen to have poor opportunities to achieve adequate living standards due to their low family income, poor health and/or insufficient education attainment. Ensuring that children complete an adequate level of education has been advocated by the Australian government as a way of improving the potential for children to have good standards of living in the future by maximising their opportunities for labour force participation (COAG Reform

Council 2009; Council of Australian Governments 2006c). Labour force participation has been recognised internationally as a means of improving the living standards of disadvantaged members of society (Organisation for Economic Co-operation and Development 2004; Productivity Commission 2005; Organisation for Economic Co-operation and Development Media Relations 2007; Australian Treasury 2011; Swan 2011). However, amongst the children who are in freedom poverty some will also have poor health. Ill health has been shown to negatively impact on the likelihood of labour force participation in adults with numerous studies showing how those with poorer health have lower rates of labour force participation and lower incomes (Australian Institute of Health and Welfare 2004, 2006a, b, 2008; Marmont 2005; Schofield et al. 2008, 2010; Nepal et al. 2009). It is not known if having a high level of education may mitigate the impacts of ill health on the chances of adult labour force participation, or whether the benefits of achieving a sufficient level of education will be offset by an individual's poor health. This study will also look at the relationship between health, education and labour force participation in adults to see if policies to improve the education achievement of young Australians may improve the future living standards of disadvantaged children.

1.1 Development of the Freedom Poverty Measure

Poverty can be seen as measuring the living standards of individuals in a given society as done in the pioneering poverty studies conducted by Booth (1889), Rowntree (1901) and Townsend (1979), who all looked at the living conditions, living standards, and styles of living of individuals. Contemporary understandings of poverty also recognise that poverty is multidimensional and involves more than just low income (see for example EUROSTAT 2002; World Bank 2008, Undated). However, within Australia most poverty studies have traditionally only looked at measures of low financial resources, or income (Saunders 1998a; Saunders et al. 2007a; Harding et al. 2001b; Harding and Szukalska 2000; Henderson 1975; Australian Bureau of Statistics 1998).

While poverty measurement in Australia has been dominated by the use of income as the primary measure of poverty, there is recognition that poverty is in fact multidimensional. The Commonwealth Senate Inquiry into Poverty and Financial Hardship (Community Affairs Reference Committee 2004) recognised that several indicators of poverty are needed, as have several Australian poverty researchers, including in studies which exclusively utilise income as an indicator of poverty (Community Affairs Reference Committee 2004; University of Queensland Social Research Centre 2009; Harding et al. 2001a). Other authors have also undertaken studies to expand the use of income alone as a measure of poverty (see for example, Saunders and Naidoo 2009; Saunders et al. 2007b; Saunders 1998b; Social Inclusion Unit 2009b); however none have adopted a multidimensional poverty approach. Due to the perception of the need for a new multidimensional measure of poverty to be developed specifically for Australia, the Freedom Poverty Measure was constructed.

The construction of the Freedom Poverty Measure drew upon the international work on multidimensional poverty measurement, and the theory underlying the Freedom poverty measure was based upon the work of Amartya Sen (Callander et al.

2011). Sen has advocated that poverty relates to 'capabilities' and 'freedom', and has reorientated poverty thought away from merely low economic resources. Sen has argued that an individual is in poverty when they lack the freedom to live the life they have cause to desire (Sen 1999). This lack of freedom derives from poor capabilities that can prevent participation in society and lead to poor living standards (Nussbaum and Sen 1993; Nussbaum 2003; Sen 1999; United Nations Development Programme 2008). Living standards are equated with the life desired by an individual—if an individual is not free to have the life they desire due to a lack of capabilities then they are seen to have poor living standards and be in poverty. This also relates to the earlier work of Townsend, that those in poverty are seen to not have the resources (or 'capabilities') to participate adequately in society, and as such have poor standards of living (Townsend 1979). This is the concept of poverty that underlies the Freedom Poverty Measure.

In order to measure 'Freedom poverty', the authors have chosen to look at the capabilities of an individual rather than their living standards. As living standards relate to the life an individual has cause to desire there will be much variation in what is actually deemed adequate living standards due to differences in tastes and perceptions. Instead the Freedom poverty measure will focus on capabilities, which give individuals the opportunity and capacity to obtain adequate living standards. The selection of capabilities was based upon consideration of what influences living standards in Australian society, and looked at international examples of multidimensional poverty measures.

Three key international multidimensional poverty measures are the Human Poverty Index (HPI) and Multidimensional Poverty Index (MPI)—developed by the United Nations Development Program (UNDP) and based upon Sen's capability approach (Laderchi et al. 2003)—and the World Bank's Millennium Development Indicators (World Bank 2008). The HPI includes measures of longevity, knowledge, decent standard of living and social exclusion; the MPI covers health, education and living standards; and the Millennium Development Indicators cover income, employment, GDP, underweight children, and calorie intake. These multidimensional measures of poverty all contain examples of indicators of living standards that can be used in addition to income in a measure of poverty, and demonstrate how multiple measures of capabilities can be combined into a single poverty measure. However, a drawback of these indicators is that they are designed to make generalisations about entire countries, and not to identify individuals who are in poverty, and some indicators cannot be applied directly to Australian society (for example, living on less than $1 per day and having universal primary education).

Other international examples of existing multidimensional measures include the 18 indicators of social inclusion developed by the European Union, the 50 indicators of social exclusion designed to measure social progress by the Joseph Rowntree Foundation, and the NZDEP96 which are a series of social measures developed in New Zealand (Salmond and Crampton 2001; Palmer et al. 2006). However, drawbacks of these measures are that they do not all identify individuals who are in poverty, rather giving aggregate measures for a country or region, and there is also uncertainty about how the multiple indicators should be interpreted as they do not give a single measure of poverty—for example, is one factor enough, or are many required for an individual to be socially excluded (Heady 2005). As such, it is

apparent that while there are numerous international examples of existing multidimensional poverty measures there is no single measure of poverty that could be adopted directly for contemporary Australian society. Despite this, the international literature and multidimensional poverty measurement practice still holds vital lessons for Australia.

For the Freedom Poverty Measure, the capabilities health, education and income were selected as dimensions of 'Freedom poverty' for Australia (Callander et al. 2011). All were chosen for their demonstrated impact on the living standards of individuals (see the following studies Harding et al. 2001a; Harding and Szukalska 2000; Saunders et al. 2007a; Dreze and Sen 1989; PovertyNet Undated; United Nations Development Programme 1995, 2008; Council of Australian Governments 2006a; UN Department of Economic and Social Affairs 2008: 5; Australian Institute of Health and Welfare 2006a), and as such were seen as key capabilities for giving freedom to build an adequate standard of living.

The capability approach of Sen shifts focus away from income as a single measure of poverty, which is only a means for quality of life, to the ends and the things people actually value—and the freedoms required to satisfy these ends. Capabilities are still linked with income, but in more complex ways (Sen 1999). The focus, when concerned with income, is on income as a capability rather than the end commodities (Dreze and Sen 1989). Good health and a life free from disability is also seen as a vital component for children to enjoy and function as they should, undertaking activities they enjoy (Dreze and Sen 1989; PovertyNet Undated; United Nations Development Programme 1995, 2008); and similarly a good education is seen as a basic right of all individuals (United Nations General Assembly 1989). Health and education have both been shown to influence the likelihood of labour force participation in adults (Nepal et al. 2009; Australian Bureau of Statistics 2006a; Kennedy and Hedley 2003; Laplagne et al. 2007; Cai and Kalb 2004). As labour force participation has been recognised to play a vital role in shaping living standards (Organisation for Economic Co-operation and Development 2004; Productivity Commission 2005; Organisation for Economic Co-operation and Development Media Relations 2007), children may find their future living standards as adults affected by their insufficient education attainment and poor health.

There are other dimensions that could be seen as key capabilities, such as housing and location, which are often included in multidimensional studies (Pearson 2005; Salmond and Crampton 2001; New Zealand Ministry of Social Development 2010; Townsend and Abel-Smith 1979). However, type of housing, or the location in which individual's live may be the result of individual choices and preferences. For instance, many coastal regions of Australia are highly valued for their scenic beauty, but also have very high rates of unemployment, income poverty and have a low socio-economic ranking (Australian Bureau of Statistics 2006c). So while an individual may live in such a socio-economically 'deprived area', this may be a choice in order to enjoy the lifestyle and scenic amenities the area naturally offers.

Once the capability dimensions were selected, indicators of each dimension were identified and the number of dimensions an individual is required to be deprived in to be labelled as being in freedom poverty was determined. This process follows that described in the 'Alkire Foster Method' (Alkire and Foster 2011a) for constructing a multidimensional poverty measure. This method guides researchers in the creation of

a multidimensional poverty measure for a specific society by giving researchers freedom in the selection of dimensions of disadvantage and indicators and cut-off points for these dimensions of disadvantage (Oxford Poverty and Human Development Initiative 2010). The Alkire Foster Method was utilised in the construction of the UNDP's MPI outlined above, and follows these steps:

1. The unit of analysis is selected where researchers decide whether they are wishing to look at the number of poor countries, regions, villages, households or individuals.
2. The dimensions that will be included in the measure are selected.
3. Selection of indicators of these dimensions, for example if economic resources are a dimension than income may be an indicator.
4. The poverty line or cut-off point for each dimension is then set to separate the 'deprived' and 'non-deprived' in each dimension. Individuals can then be identified as deprived or non-deprived with respect to each dimension and the number of deprivations experienced by each individual is then tallied.
5. A second cut-off is then set which determines the number of dimensions an individual must be deprived in to be considered to be in poverty. Each dimension can also be assigned a weight. That is, each dimension can be seen to have equal importance in which circumstance the weights are equal, or one dimension may be seen to be more important than another and the weight assigned to this dimension would be set higher (Alkire and Foster 2011a).

The process undertaken in the construction of the Freedom Poverty Measure, and how this is justified by the steps in the Alkire-Foster Method, is outlined in the methods section below.

2 Methods

2.1 Construction of the Freedom Poverty Measure and Identifying Those in Freedom Poverty

Under the Alkire Foster Method (Alkire and Foster 2011a), the first step in the creation of the freedom poverty measure was selecting the unit of analysis. As the goal of the freedom poverty measure is to measure the number of individuals in Australian society in poverty, the individual was chosen as the unit of analysis. As indicated above, income, health and education were chosen as the dimensions of capability disadvantage to be included in the measure and this follows the second step of the Alkire-Foster Method.

The selection of indicators for income, health and education and then setting the cut-off points for each dimension to separate those who were and were not disadvantaged in each dimension was in part constrained by the data source being used. This aligns with the third and fourth steps of the Alkire Foster method and this method also recommended that a single data source be used for all of the indicators (Alkire and Foster 2011b).

The 2003 Survey of Disability, Ageing and Carers (SDAC) provided the data source to which the Freedom Poverty Measure was applied (Australian Bureau of

Statistics 2005). The SDAC contains detailed information on demographic status (including sex, age (in 5 year age groups), and age of family members), labour force participation, health and disability status, education attainment and participation, and economic information on individuals and their families.

The SDAC is a comprehensive, nationally representative survey conducted by the Australian Bureau of Statistics (ABS) between 23 June 2003 and 1 November 2003 (Australian Bureau of Statistics 2005). The survey covered individuals in all states and territories, including both rural and urban populations—however, those in very remote areas were excluded. The 2003 SDAC covered both private and non-private dwellings, excluding gaols and correctional institutions. The ABS selected households at random and surveyed every individual within the household. For children aged under 15 years, and for those aged 15 to 17 who did not have parental consent to be interviewed, proxy interviews with a parent of the child was conducted. There were 36 241 respondents in 14 019 households, and 5 1 45 individuals from 303 non private dwellings and 564 care-accommodation establishments. The response rate for those in private and non private dwellings was 89%, and 90% for those in care-accommodation (Australian Bureau of Statistics 2005). The original 2003 SDAC data was weighted by the ABS to represent the whole Australian population in 2003 by broad population variables such as age and sex.

The indicator for income was chosen to be the equivalised median income unit[1] income and the cut-off point the 50% of the median equivalised income-unit income poverty line. This was selected as it is widely used and accepted in Australia (Saunders et al. 2007a; Tsumori et al. 2002; Harding and Szukalska 2000). To identify individuals who fell below the poverty line for income the total income unit (the 'income unit' will be referred to hereafter as 'family') income from the SDAC was calculated by tallying the individual incomes of all members in the family, regardless of age. The OECD-modified equivalence scale (de Vos and Zaidi 1997) was utilised to accommodate for the differences in numbers and composition of families. The equivalence score for each family was calculated whereby a value of 1.0 was given to the first adult member (person aged 15 years and over), a value of 0.5 to each subsequent adult family member and a value of 0.3 given to each child (person aged under 15 years).

Equivalised family income was then estimated for each individual by dividing their total family income by the equivalence score for their family. The median value of equivalised family income was then obtained for the whole Australian population in 2003 (in 2003, the income poverty line (50% of the median equivalised family income) was AU $260 per week). Any child or youth whose equivalised family income was below the income poverty line was deemed to be disadvantaged in terms of income.

The indicator for health was chosen to be disability status. Within the 2003 SDAC the health of those aged 5 to 19 years was measured by grouping individuals into those who had a long term health condition, and those who did not; and with a

[1] The income unit is defined by the ABS as "a group of two or more related persons in the same household assumed to pool their income and savings and share the benefits deriving from them equitably; or one person assumed to have sole command over his or her income, consumption and savings" (Australian Bureau of Statistics 2005)

second variable, grouping those had a disability and those who did not.[2] All individuals with a disability had a long term health condition, however, not all long term health conditions produced a disability amongst individuals as the health condition may not have restricted the individual in any way (for example, mild asthma). In the SDAC, a person is classified as having a 'disability' if they have a "limitation, restriction or impairment, which has lasted, or is likely to last, for at least 6 months and restricts everyday activities" (Australian Bureau of Statistics 2004: 6). Disability status has been shown previously to be a good measure of health that reflects the actual functional capacity of individuals (Callander et al. under review a, b) as such it was selected to be an indicator of health; the cut off point for those disadvantaged in terms of health was having a disability.

The indicator for education was chosen to be the level of highest education attainment. In the 2003 SDAC all individuals' highest school and non-school qualifications were recorded, as well as whether individuals were still studying or had left school. It has been shown that year 12 is a sufficient level of education to allow people a decent chance of participating in the labour force (Callander et al. under review a, b). As such, Year 12 qualification or higher (postgraduate degree, bachelors degree and advanced diploma/certificate IV or certificate III) was chosen as the cut-off point for disadvantage in terms of education. As not all individuals were of an age where they had completed their education, those who were still studying were not seen to be disadvantaged in terms of education.

Once individuals were identified as be disadvantaged or not in terms of income, health, and education, the three indicators were combined to form a single measure of poverty—the Freedom poverty measure. This aligns with the fifth step of the Alkire-Foster Method. Each indicator was weighted, with health and education given a weight of 1 each, and income a weight of 2. Individuals were scored on their deprivation with a value of two given for income deprivation, 1 for health deprivation, and 1 for education deprivation. Income was given a higher weight due to its perceived importance to living standards in Australia as evident by its exclusive use in poverty measurement to date and also in the political rhetoric within the country that focuses on improving income as a means of improving living standards (Australian Treasury 2011; Council of Australian Governments 2006b; Social Inclusion Group 2011a; Swan 2011). If an individual scored three or more they were deemed to be in freedom poverty; if they scored four they were considered to be in extreme freedom poverty.

A continuum of freedom poverty can be created that views those with high economic resources, good health and sufficient education as being at the highest end of the continuum. This is followed by those who can be seen as 'at risk of Freedom poverty': those with high economic resources and either poor health or insufficient education, and then those with high economic resources and poor health and insufficient education. These individuals are only out of Freedom poverty due to their higher income, and they are already limited in at least one other area of capability.

[2] The 2003 SDAC recorded other measures of health for those aged 15 years and over. However, given that this focus of this study was 5 to 19 year olds these other indicators of health could not be utilised.

2.2 Statistical Analysis

The records for the 5 to 19 year old age group were extracted from the SDAC dataset as 5 to 19 year olds were the focus of this study. Initial descriptive statistical analysis was undertaken for the 5 to 19 year old age group in the Australian population, based upon the weighted records in the 2003 SDAC. This was done to determine the number of individuals in income poverty and the health and education capability status of this population. The number of individuals in Freedom poverty were identified, for those aged 5 to 19 years the number of individuals in extreme Freedom poverty was also identified and the number of individuals 'at risk' of Freedom poverty (high family income but poor health or insufficient education).

Following this, further descriptive analysis and regression analysis was undertaken to determine the relationship between gender, age and being in Freedom Poverty. Logistic regression models were used to compare the odds of being in Freedom poverty for males compared to females, using females as the reference group and adjusting for age; this was also done to for those of different age groups using 5–9 year olds as a reference group and adjusting for sex.

The ability of a sufficient level of education to mitigate the effect of health on labour force participation was then assessed for those of labour force age (24 to 64 years). The population was broken into three groups of health status with increasing severity of ill health according to the health utility scores that were used in the Freedom poverty measure. Three groups were created with deteriorating levels of health: 1) those with no disability; 2) those with a disability and a better health utility score based on the SF-6D (SF-12) (Brazier and Roberts 2004) than was the average for their age group; and 3) those with a disability and a poorer health utility score based on the SF-6D (SF-12) than the average for their age group. These categories of health have been shown to produce increasing poorer outcomes in terms of labour force participation and employment restrictions (Callander et al. under review a, b).

Initial descriptive analysis was undertaken to look at the different proportion of individuals who were employed in each group of disability with sufficient education and insufficient education. The difference in the odds of being employed was then assessed for those with insufficient education compared to those with sufficient education in each category of disability. Sufficient education was used as the reference group and the results were adjusted for age and gender.

All analyses were undertaken using SAS V9.2 (SAS Institute Inc., Cary, NC, USA). All statistical tests were two sided with the significance level set at 5%. All results are presented with their 95% confidence intervals.

3 Results

3.1 Children in Freedom Poverty

There were 7 754 records of individuals aged between 5 and 19 years on the 2003 SDAC. These data represented 3 956 000 individuals in the Australian population

aged 5 to 19 years. Of these individuals, 51% were male and 49% female; 33% were aged 5 to 9 years, 34% 10 to 14 years, and 34% 15 to 19 years.

The non-equivalised income poverty lines for families of different compositions are given below in Table 1 by way of an example of the level of income families would require to avoid being labelled as being disadvantaged in terms of income by the Freedom Poverty Measure in 2003. Of the 5 to 19 year old population, 869 000 individuals (or 22% of this population) were in income poverty.

The 5 to 19 year old respondents in the 2003 SDAC were classified according to their health status. As shown in Table 2, 9% had a disability, which equated to nearly 400 000 children or youths having a disability in Australia in 2003.

The 5 to 19 year old population were classified according to their education status as shown in Table 3, below.

Of the children and youths aged 5 to 19 years, 5% or 208 000 Australians aged 5 to 19 years were considered to be in Freedom poverty under the Freedom Poverty Measure (Table 4). That is, 24% of the 5 to 19 year olds who were in income poverty also had either an insufficient level of education or poor health—or both. There were 111 000 individuals in income poverty with poor health (of these, 94 000 had poor health only and 17 000 had poor health and insufficient education). There were 114 000 individuals who were in income poverty with insufficient education (of these, 97 000 had poor education only and 17 000 individuals had insufficient education and poor health). Less than one percent of all 5 to 19 year olds, or 17 000 individuals, had poor family economic resources, poor health and insufficient education and were deemed to be in extreme Freedom poverty (Table 4).

Of those who did have relatively high family income and were not in income poverty, 369 000 had poor health or insufficient education (9% of the 5 to 19 year old population). That gives a total of 1 238 000 children aged 5 to 19 years with at least one form of capability disadvantage (either low family income, poor health or insufficient education). This is almost one-third of the 5 to 19 year old population.

Amongst the 5 to 19 years olds—6% of males were in Freedom poverty and 4% of females were in Freedom poverty. After controlling for age, males were significantly (OR 1.64, 95% CI: 1.31–2.05, p=<.0001) more likely to be in Freedom poverty than females. When looking at different age groups, 3% of 5 to 9 year olds were in Freedom poverty, 2% of 10 to 14 year olds were in Freedom

Table 1 Income poverty line for different family types based on 50% of the median income unit income for the 2003 Australian population

Income unit ('Family') type	Income poverty line in 2003 (AU$)
Single adult	$260
Couple only	$390
Couple, with 1 child	$470
Couple, with 2 children	$550
Single adult, with 1 child	$340
Single adult, with 2 children	$420

Currency is 2003 Australian dollars, AU$1 was equal to approximately £0.55 and US$0.7 in 2003

Table 2 Health status of the 5 to 19 year old Australian population, 2003

Health status	Number in population	Proportion of working aged population
No disability	3 585 000	91%
Has a disability	374 000	9%

poverty, and 10% of 15 to 19 years were in Freedom poverty. When controlling for sex and using 5 to 9 year olds as a reference group, those aged 10 to 14 did not have a significantly different chance of being in Freedom poverty (OR 0.77, 95% CI: 0.53–1.10, p=0.1446), while those aged 15 to 19 years were significantly more likely to be in Freedom poverty (OR 3.89, 95% CI: 2.95–5.13, p=<.0001).

3.2 Education and Disability—Adults Aged 25–54 Years

Table 5 shows the proportion of individuals who were employed with sufficient education and insufficient education in each disability type. A sufficient education was deemed to be having at least a year 12 level of highest education attainment (i.e. those with a postgraduate degree, bachelors degree, advanced diploma, certificate IV or certificate III). Amongst those with no disability, 84% of individuals who had sufficient education were employed; whereas only 62% of those with insufficient education were employed. Table 5 shows that the proportion of individuals who were in employment decreases regardless of level of education as disability increases in severity. However, amongst those with different levels of disability, those with a sufficient level of education had a higher proportion of individuals in employment than those with insufficient education. Regardless of disability type amongst those with sufficient education, there was a consistently higher proportion in employment than not in employment; whereas amongst those with insufficient education, there was a greater proportion not in employment than in employment for those with a disability and good health utility score (a mild disability) and a disability and poor health utility score (a severe disability).

Once adjusted for age and sex, it can be seen that those with sufficient education had significantly higher odds of being in employment across all disability groups (Table 6). Amongst those with no disability the odds of being in employment was 2.76 times higher (95% CI: 2.26 to 3.36) for those with sufficient education compared to those with insufficient education, controlling for age and sex. The

Table 3 Education status of 5 to 19 year old Australian population, 2003

Education status	Number in working aged population	Proportion of working aged population
Still at school	3 275 000	83%
Left school, completed year 12 or higher	453 000	11%
Left school before completing Year 12	228 000	6%

Table 4 Poverty status of the 5 to 19 year old Australian population, 2003

Poverty status	Number in 5–19 year old population	Proportion of 5–19 year old population
Not in income poverty	3 090 000	78%
In income poverty	869 000	22%
In freedom poverty	208 000	5%
In extreme freedom poverty	17 000	>1%
At risk of freedom poverty	369 000	9%
TOTAL 5–19 year old population	3 959 000	–

higher chance of being in employment for those with sufficient education compared to those with insufficient education was repeated for those with a disability and a good health utility score and those with a disability and a poor health utility score. Regardless of disability severity those with sufficient education had higher chances of being in employment than those with insufficient education.

4 Discussion

4.1 Freedom Poverty Importance

Using the Freedom Poverty Measure, 208 000 children and youths aged 5 to 19 years were identified as being in Freedom poverty in Australia in 2003. Of the individuals in freedom poverty, just over 100 000 children and youths had a low family income and also had a disability, but still had a sufficient level of education; a similar number also had a low family income and an insufficient education but no disability. Only a small percentage (less than one per cent), or 17 000 children and youths, had a low family income and both a disability and an insufficient level of education.

The study found that those aged between 15 and 19 years were more likely to be in Freedom poverty than those of a younger age. The high rate of youth in poverty

Table 5 Proportion of individuals who are in employment with sufficient education and insufficient education within each level of disability

Health measure	Sufficient education		Insufficient education	
	% in employment	% not in employment	% in employment	% not in employment
No disability	84%	16%	62%	38%
Disability and good health utility score	67%	33%	42%	58%
Disability and poor health utility score	53%	47%	28%	72%

Table 6 OR of being employed for those with sufficient education compared to those with insufficient education in each disability group, adjusted for age and sex

Health measure	Insufficient education	Sufficient education		
		OR	95% CI	*p*-value
No disability	REFERENCE	2.76	2.26 to 3.36	<.0001
Disability and good health utility score	REFERENCE	3.13	2. 56 to 3.83	<.0001
Disability and poor health utility score	REFERENCE	3.09	2.87 to 3.33	<.0001

has been recognised both within Australia and internationally (Eardley 1998; Aassve et al. 2006). In Australia this could be attributed to the low pay rate received by many youths who have left education institutions for the labour force (Eardley 1998). As this is also the age when many teenagers and young adults will be leaving home, they often will not have the income of their parents to supplement their own wages (Aassve et al. 2006). Furthermore, Australian legislation requires all youths aged under 15 years to participate in education (or up to Year 10) (Council of Australian Governments 2009). After the age of 15, individuals are not required to attend school, which may contribute to many individuals leaving school before completing Year 12 (the 'sufficient level of education' defined under the Freedom Poverty Measure). It is estimated that between 45,000 and 50,000 young Australian exit schooling early before the completion of Year 12 (Access Economics 2005).

Other studies within Australia have looked at childhood poverty; however most have used only family income to identify those in poverty (Abello and Harding 2004; Bradbury and Jantti 1999; Harding and Szukalska 1999; Harding et al. 2001b; Corak 2005; Heady and Wooden 2005). By comparison internationally, Bradbury and Jantti (1999) estimated that Australia had the fifth highest rate of childhood poverty in 1994 amongst the 25 countries in their study (Bradbury and Jantti 1999). Corak (2005) looked at childhood poverty in 25 OECD countries in 1999/2000 and found that Australia was in the middle to high end of child poverty rates (Corak 2005).

Applying the Freedom poverty measure does result in a lower number of children and youths being labelled as being in 'Freedom poverty' than in 'income poverty'. For the 5 to 19 year old population 22% were classified as being in income poverty and 5% were classified as being in Freedom poverty. However, when including the number of children and youths at risk of Freedom poverty, the number of individuals with at least one form of capability limitation increases to nearly one third of the subject population. The purpose of the Freedom poverty measure is to identify those who have *multiple* forms of disadvantage, so while it does seem to be a positive outcome that only 5% of the 5 to 19 year old population is in Freedom poverty, nearly one-quarter of those in income poverty have a further element of disadvantage. These results do indicate that income measures of poverty do not reveal all the layers of disadvantage experienced by Australian children and youths. The multiple capability limitations would normally not be identified by income measures of poverty, and the additional disadvantage experienced by these children and youths who not only had relatively low family income, but also had poor health

and/or insufficient levels of education would not be recognised. The relative performance of Australia in ensuring equity for all children will be able to be made by comparing the results found in this paper to those generated from future population studies. As the Freedom poverty measure has not been developed for countries other than Australia, and poverty measures using similar dimensions have not been developed by other countries, it is not possible to compare Australia's current performance with other countries.

4.2 Limitations

There are a number of limitations to this paper that must be acknowledged. Firstly, the scope of the 2003 SDAC did not cover homeless children and youths, or those in very remote areas. These may have been important populations to include in the study as they are populations commonly associated with disadvantage. Indigenous Australians, which are commonly associated with having disproportionately high levels of childhood disadvantage (Community Affairs Reference Committee 2004; National Health and Hospitals Reform Commission 2009; Pink and Allbon 2008), are commonly located within very remote areas of Australia (Australian Bureau of Statistics 2006b) and as such may be under-represented. As ethnicity was not a variable within the SDAC the likelihood of being in poverty between Indigenous and non-Indigenous Australian children and youths also could not be tested.

Secondly, the data was cross-sectional so the study could only look at the current health and education status of individuals. Some children who were not in freedom poverty as they were still attending school may leave school before completing year 12 and as such be in freedom poverty in the future: as mentioned above, it is estimated that currently between 45,000 and 50,000 young Australians exit schooling before the completion of Year 12 (Access Economics 2005).

Thirdly, this study has not taken into consideration the perspectives of children on their own living standards and as such uses the author's value judgements about whether they have the capabilities to be achieving adequate living standards or not. If there was a data source available to take children's own perspectives into account this would further validate the classification of children as being in freedom poverty. While these limitations may have affected the accuracy of the results produced in representing the number of young Australians in poverty, the results still reflect how the Freedom poverty measure can be applied to show the multiple levels of disadvantage experienced by young Australians.

Finally, what was also unable to be measured in this study was the additional cost of raising a child with a health condition. It has been shown in other studies that having a family member with a disability affects the rate at which the family can translate their income into living standards, due to the addition costs of supporting those with a disability. Having a family member with a disability can result in the family being more likely to be in income poverty as their disposable income is reduced by the additional costs of the disabled family member. This has been taken into account in other studies by adjusting family income to take into consideration the costs of disability (Zaidi and Burchardt 2005). A study in the UK has done this specifically for children (Burchardt and Zaidi 2008), however, no equivalence scales to account for the costs of disability in children

have been developed for Australia (although Saunders (2006) has done this for Australian adults). As such, the results in this study may over-estimate the income of families with disabled children.

4.3 Labour Force Participation

Education and health will play a vital role in children's adult lives by influencing their chances of labour force participation. Childhood and young adult education attendance has been recognised in other studies to have the potential to give disadvantaged individuals the capability to overcome poverty in the future, through education's strong influence on labour force participation (Australian Bureau of Statistics 2006a; Kennedy and Hedley 2003; Laplagne et al. 2007). The Council of Australian Governments has developed a National Education Agreement which focus on young people achieving a minimum of Year 12 education, with the aim of ensuring that Australia students obtain "knowledge and skills to participate effectively in society and employment" (COAG Reform Council 2009: xv). However, little attention has been paid to the health of children in determining and influencing their future labour force participation chances, and hence ability to build adequate standards of living.

There were a little over 100 000 children and youths with low family income and poor health in this study. While it is recognised in existing literature that those with ill health have lower rates of labour force participation (Schofield et al. 2008; Cai and Kalb 2004), this study also looked at how having a sufficient education may offset the impacts of disability by looking at the labour force participation rates of adults with a disability and insufficient and sufficient levels of education. The results of this study have shown that having a better education does improve the chances of being in employment amongst those with poor health. This emphasises the importance of ensuring those children with a disability receive an adequate education for increasing their future likelihood of labour force participation. However, it has also been shown that health has a major impact on the labour force participation of individuals—there is a decreasing proportion of individuals in employment, regardless of education type, as disability increases in severity. This is consistent with the findings of Wilkins (2004) who found that disability impacted on labour force participation on the three different levels of education in their study. While it is essential to ensure that those with a disability receive an adequate education, similar to children with no health problems, addressing the health limitations of children is also essential as disability status still negatively affects labour force participation regardless of education achievement.

4.4 Policy Implications

It is known that both education and health have an important impact on an individual's chances of labour force participation. On a positive note, it has been shown that of the children and youths in income poverty, around three quarters may have the capability (good health and a sufficient education) to escape income poverty in the future. This is certainly a potential positive outcome for Australia, however there are a little over 200 000 children and youths who are in income

poverty and have another capability limitation—either poor health or insufficient education. So not only will these children's living standards be affected now, through their low family income and poor health and/or education, but their future living standards may also be affected as their health and education may restrict their employment opportunities once they are of labour force participation age. As such, policies to improve the welfare of children, through promoting good health and access to education should particularly focus upon these multiply deprived individuals and ensure that they have an equal chance of achieving adequate living standards in the future.

Health interventions and treatments aiming to improve the health of children often do not take into consideration the impact of child's disability on long-term indirect costs such as the child's future labour force participation. Few cost-effectiveness studies have included as benefits the prevention of other indirect costs of disability amongst children, the ones that have looked at indirect costs have looked at special education attendance, or time parents take off work during treatment (see for example Weimer 2001; Drane 1997), and there is also a lack of recognition of the time-frame over which costs are incurred. For example, most studies look at short-term costs, such as treatment costs at 6 months or 1 year (Ball and Bennett 1999; Weimer 2001), or time parents take off work while the treatment occurs (Bartick, Reinhold 2009). However, due to the potential long-term nature of childhood disabilities and health conditions, the costs will be incurred over a much longer period of the child's life, including the costs of workforce absence once children reach workforce age. As such, childhood health care is often not linked to policies to maximise children's future labour force participation rates in a way that childhood education currently is. Similarly, health interventions are often not targeted to children at greatest risk of long term disadvantage.

Policy responses to address the marginalisation of disadvantaged children and youths within Australia should take a multidisciplinary approach, to ensure those with multiple forms of disadvantage are targeted. The Australian Commonwealth Social Inclusion Unit has focused on supporting disadvantaged children through child protection schemes, building family support and partnerships, and early childhood enrichment programs (Social Inclusion Group 2011b). The unit also has a separate focus on the importance of overcoming parental unemployment for the welfare of children, (Social Inclusion Group 2011a) and in promoting early childhood development and education in the home (Social Inclusion Unit 2009a). However, the approach is somewhat fragmented and does not identify how both improving parental employment (and hence increasing family income) and improving education throughout childhood, and also the value of good health all will contribute to improving childhood disadvantage. This study has shown that many children have multiple forms of disadvantage that are affecting their quality of life.

Within Australia, there have been numerous studies that have measured childhood poverty. These studies have primarily used one dimension of disadvantage—income. There has been an overall failure to see health and education as a part of poverty, and subsequently measure poverty based on multiple forms of disadvantage. International methods of poverty measurement have begun to use multidimensional measures of poverty. The Freedom Poverty Measure has combined health and

education with the traditional means of measuring income poverty in Australia to give a more holistic view of the disadvantage facing many Australian children and youths.

Acknowledgements Funding for this study came from the National Health and Medical Research Council (NHMRC) under a Dora Lush Standard Scholarship.

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