

# **Disability, participation and youth wellbeing: a fixed effects approach**

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## **Abstract**

Prior studies find economic and social participation important for wellbeing; what is less clear is whether such participation is more important for people with disability. Using the first eight waves of the Household, Income and Labour Dynamics in Australia survey, this research confirms a negative impact of disability and a positive role of participation on the overall life satisfaction of youth (aged 15–24 years). In particular, economic and social participation is significantly more important for young people with disability and also more significant than income among the general population.

**JEL Classification:** E24; J13; J14

**Key words:** disability, wellbeing, employment, social participation, youth

# I Introduction

Building a socially inclusive society is an important objective of many governments. In this context, knowing which aspects of social inclusion matter most for wellbeing is as important as identifying the target groups with higher risks of exclusion. In addition, the existing literature shows that some factors may affect the wellbeing of different groups in different ways; for instance, the impact of unemployment and marriage dissolution on wellbeing varies significantly by age and gender (Marks and Fleming 1999; Winkelmann and Winkelmann 1998). As such, a better understanding of the different effects of key influencing factors on different focal groups would be informative for choosing and prioritising appropriate interventions.

People with disability are commonly identified as a group with a higher risk of social exclusion (Burchardt 2003; Hayes, Gray and Edwards 2008; Horvath-Rose, Stapleton and O'Day 2004). However, our knowledge about the extent to which their wellbeing is affected by disability and exclusion is fairly limited, and even less, if anything, is known regarding whether exclusion affects their wellbeing in a different way from those without disability.

The current research aims to contribute to filling this gap in the evidence by investigating the determinants of the subjective wellbeing of youth (aged 15–24 years) with a focus on the potentially different effects of economic and social participation on the wellbeing of young people with and without disability. Youth are at a transitional life stage, and the success of the transition has important implications for their lifetime wellbeing; thus youth are of particular interest to public policy. Recent studies on social and economic participation of Australian youth, using different datasets, find differences between youth with and without disability

generally insignificant in this respect (Yu 2009a; 2009b); as such, it is interesting to know whether these participations equally matter for the wellbeing of the two groups.

This research is based on the first eight waves of the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The key measure of subjective wellbeing is self-reported overall life satisfaction, which is often used as a measure of happiness.<sup>1</sup> The results suggest that effects of economic and social participation on youth wellbeing are significantly different by disability status—more important for young people with disability than for the general population—and are also more significant than income for the wellbeing of young people in general.

The remainder of the paper is structured as follows. Section 2 provides a brief literature review, while Section 3 describes the data and the methodology. The main results are reported and discussed in Section 4, and the last section concludes.

## **II Literature review**

Economists care about people's happiness no less than psychologists, but for a long time the dominant view was that happiness (or utility in economics terms) could not be reliably measured and compared interpersonally. With a creative 'revealed-preference' approach, they have successfully avoided the direct measurement of utility (Frey and Stutzer 2002b). However, following the pioneering work of Easterlin (1974), more and more economists realised the benefits of measuring happiness directly.

The stock of international literature on happiness is substantial and still fast growing. For a comprehensive literature review and a thorough discussion of the issue, refer to Frey and Stutzer (2002a). Frey and Stutzer (2002b) and Ng (2008) provide a good summary of what we have learnt from happiness research and how we

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<sup>1</sup> In this paper, subjective wellbeing, overall life satisfaction and happiness are used interchangeably.

can achieve better results and better applications. This paper only briefly reviews relevant studies with a focus on the determinants of subjective wellbeing and particularly the role of disability and participation.

Income and economic participation, not surprisingly, is the most common subject in the economics literature on happiness. Theoretically, holding other factors constant, extra income shifts the budget constraint upwards and gives people more choices; consequently, higher income should make people happier. Many studies do show that people living in rich countries are happier than people in poor countries and within a country richer people are generally happier than poorer people (Blanchflower and Oswald 2000; Diener, Diener and Diener 1995; Frey and Stutzer 2000). However, such a proposition has been challenged by the observation that over the last several decades in some developed countries such as the United States and Japan, notwithstanding the sharp increase in per capita income, the average levels of happiness showed little change (Frey and Stutzer 2002a). People tend to adapt to their standard of living (Clark, Frijters and Shields 2007), and there is also evidence suggesting that relative income matters more than absolute income (Easterlin 1974; 1995; Ferrer-i-Carbonell 2005). Furthermore, an increasing number of studies based on longitudinal data indicate that income, if it matters at all, is much less important than many other factors such as employment and personal relationships for people's subjective wellbeing (Powdthavee 2008; Winkelmann and Winkelmann 1998).

Unemployment, by contrast, is consistently found to be among the most significant influencing factors of happiness (Clark and Oswald 1994), and the unemployed suffer even higher non-pecuniary costs (e.g., depression, stigma and loss of self-esteem) in addition to income loss (Di Tella, MacCulloch and Oswald 2001; Frey and Stutzer 2002a; Winkelmann and Winkelmann 1998). The impact of an

unemployment spell also varies with its sequence and duration. For example, people tend to suffer more from the first spell and/or a longer duration of unemployment (Clark, Geogellis and Sanfey 2001; Dockery 2005). The detrimental role of unemployment on subjective wellbeing is also underscored by findings reported in non-economic literature (e.g., Marks and Fleming 1999; Winefield *et al.* 1991).

Other economic factors can also influence happiness; for instance, inflation (Di Tella, MacCulloch and Oswald 2001), and wealth (providing economic security) (Heady and Wooden 2004). However, their effects are generally smaller than the effects of unemployment.<sup>2</sup>

The role of social participation on subjective wellbeing is widely recognised in non-economic studies (Burt 1987; Phillips 1967; Pinqart and Sorenson 2000; Taylor *et al.* 2001; Ueno 2005). In the economics literature, although it is acknowledged, it is rarely the focus of research. One exception is Powdthavee (2008), who, using the British Household Panel Survey (BHPS), finds that social participation plays a substantially more important role than income in affecting people's life satisfaction. Helliwell (2006) also confirms the importance of social capital (measured as frequent contacts with family, friends and neighbours as well as trust) for people's wellbeing.

In the economics literature on happiness, disability is occasionally used as a control variable, and is generally found to be negatively associated with wellbeing (Heady and Wooden 2004; Powdthavee 2008; Shields and Wooden 2003). Pagan-Rodriquez (2009), using a Germany panel dataset, confirms a negative effect of the onset of disability on the wellbeing of working age males, but he also reveals that people adapt to their disability over time and gradually return to their pre-disability level of wellbeing. Recently, Jones and Sloane (2010) show that disabled workers are

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<sup>2</sup> Veenhoven (1993) finds no significant relationship between average happiness and inflation rates.

subject to higher risk of skill mismatch, which in turn negatively affects earnings and job satisfaction.

In contrast to disability, health is more commonly included in the happiness function and has been proved to be one of the most important determinants of life satisfaction (Frey and Stutzer 2002a). Other significant influencing factors for happiness also include age, gender, ethnicity, race, separation/divorce, personality, and some institutional factors such as democracy (Dockery 2005; Frey and Stutzer 2002a; Helliwell 2006; Marks and Fleming 1999).

In addition, the effects of some factors on life satisfaction, for instance unemployment and marriage, are found to vary by age and gender (e.g., Dockery 2005; Winkelmann and Winkelmann 1998). However, virtually no published research examines how the effects of economic and social participation on people's wellbeing vary by disability status. The issue is of high policy relevance, especially given that economic and social participation is an important aspect of social inclusion, and that people with disability have been commonly identified as a group with a higher risk of social exclusion.

### **III Data and methodology**

#### ***(i) Data***

The research is based on the first eight waves of the Household, Income and Labour Dynamics in Australia (HILDA) Survey (2001–2008). HILDA is a nationally representative survey of Australia, commencing in 2001 with 7,682 households and 19,914 individuals.

The sample used for this research consists of 5,157 young people aged 15–24 years in the first eight waves of HILDA. There are nearly 16,000 observations

(person-wave) in total in the sample, approximately 2,000 observations in each wave. See Table A.1 in Appendix for a statistical summary of the sample.

In this research, disability is defined as having any long-term health condition, impairment or disability that restricts one's everyday activities, and has lasted or is likely to last, for six months or more. It is further classified into two categories: (1) with work limitations, that is, the disability limits the type or amount of work they can undertake; and (2) without work limitations. The level of disability could be considered more severe among those with work limitations.

Young people in the sample are generally very satisfied with their life with a mean score of 8.04 on a scale from 0 (totally dissatisfied) to 10 (totally satisfied). Less than 2 per cent of young people reported not being satisfied (with a score less than five); in contrast, more than 14 per cent reported being totally satisfied.

There are notable differences in overall life satisfaction between different groups (see Table A.1). In particular, young people with disability, either with or without work limitations (but especially the former), have a significantly lower level of satisfaction than their peers without disability. Life satisfaction also varies significantly by participation. Young people who are unemployed and not studying full-time are the least happy, followed by those who are not in the labour force and not in full-time study; in contrast, those who are studying full-time and are either working part-time or not in the labour force are the happiest.<sup>3</sup> Young people with an active club membership and more frequent contact with friends/relatives are also considerably happier than others.<sup>4</sup>

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<sup>3</sup> Part-time study was not considered mainly due to the lack of a good measure in the data.

<sup>4</sup> Note that the level of happiness steadily decreases with the highest education level achieved; this is mainly because, as will be clear in multiple regression analysis, higher achieved education level is positively correlated with age while age is significantly and negatively correlated with happiness.

Table 1 differentiates happiness by different combinations of disability and participation status. Generally, among any of the three disability categories, participation is associated with higher levels of overall life satisfaction; and comparing groups at a given participation level, disability (especially disability with work limitations) is associated with lower levels of satisfaction. Table 1 also shows that participating young people with disability may be happier than the non-participating young people without disability. For instance, the average level of overall life satisfaction is 8.04 for young people who have a non-work-limited disability and have an active club membership, slightly higher than that for young people without disability who are not active club members (7.96).

**Table 1: Overall life satisfaction of youth by disability and participation status**

Participation status	Disability status		
	No disability	With non-work-limited disability	With work-limited disability
<i>Economic participation:</i>			
1. Full-time working (FTW)	8.020 (1.28)	7.796 (1.47)	7.325 (1.76)
2. Part-time working (PTW) and full-time studying (FTS)	8.247 (1.14)	7.962 (1.45)	7.761 (1.31)
3. PTW and not FTS	8.018 (1.32)	7.887 (1.59)	7.429 (1.80)
4. Unemployed and FTS	8.118 (1.42)	8.283 (1.38)	7.869 (1.53)
5. Unemployed and not FTS	7.641 (1.79)	7.305 (1.63)	6.636 (2.24)
6. Not in the labour force (NILF) and FTS	8.253 (1.25)	8.009 (1.92)	7.628 (1.76)
7. NILF and not FTS	7.950 (1.63)	7.369 (2.55)	6.449 (2.50)
<i>Active club membership:</i>			
0. No	7.964 (1.35)	7.687 (1.85)	7.009 (2.09)
1. Yes	8.284 (1.23)	8.040 (1.41)	7.689 (1.66)
<i>Frequency of contact with friends/relatives:</i>			
1. Monthly or less	7.881 (1.48)	7.364 (2.13)	6.730 (2.31)
2. Two or three times a month	7.786 (1.40)	7.872 (1.36)	6.936 (2.03)
3. Once a week	8.033 (1.27)	7.764 (1.58)	7.017 (2.00)
4. Several times a week	8.135 (1.23)	7.978 (1.47)	7.527 (1.81)
5. Daily	8.456 (1.32)	7.946 (2.01)	7.844 (1.67)

Note: standard deviations in parentheses. Responding person weights have been used.

## ***(ii) Methodology of multivariate analysis***

In the happiness literature, several methodologies are often applied in the multiple regression analysis. One is using a cross-sectional approach, which is commonly used

when longitudinal data are not available; for example, Heady and Wooden (2004), and Di Tella, MacCulloch and Oswald (2001). Unobserved heterogeneity (e.g., values and social norms) is the most challenging issue for this approach.

Another approach is using random effects models with longitudinal data (e.g., Dockery 2005). However, it requires an assumption of independence between the unobserved individual effect and independent variables, which does not necessarily hold. There is evidence showing that work limitation reporting and participation decisions are jointly driven by unobserved factors (Oguzoglu 2010).

An alternative approach is to use fixed effects models, which do not require the aforementioned assumption on independence (e.g., Powdthavee 2008; Winkelmann and Winkelmann 1998). In this research, Hausman tests also consistently suggest that fixed effects models are preferable to random effects models. However, it should be kept in mind that fixed effects models also have their limitations. For instance, individuals with unchanged outcomes over time are excluded, thus the estimates tend to be less precise with a smaller sample size; and time-constant variables cannot be included. This research uses an unbalanced panel to keep a larger sample; in some model specifications, a few time-constant variables of particularly interest, such as gender, are transformed into time-varying ones by interacting with other time varying variables such as partnered status.

There are two ways of treating the dependent variable—overall life satisfaction: ordinal or cardinal.<sup>5</sup> Few problems arise in using an ordinal approach and an ordered logistic model can be fitted. However, it is technically very challenging to estimate a fixed effects ordered logistic model. Therefore, some studies choose to re-classify the

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<sup>5</sup> For a detailed discussion on the issue, refer to Kristoffersen (2010).

variable to create a binary variable (1. happy/satisfied; 0. unhappy/unsatisfied) and estimate a fixed effects logit model (e.g., Winkelmann and Winkelmann 1998).

Subscribers to ordinal utility may have issues with the latter approach—that is, treating happiness as a cardinal variable. Nonetheless, this paper chooses this approach for several reasons. First, it makes the estimation much easier, and previous studies also suggest it generates quantitatively very similar results to the ordinal approach (Frey and Stutzer 2002b; Ferrier-i-Carbonell and Frijters 2004).<sup>6</sup> Second, the distribution of satisfaction is considerably different between young people with and without disability in the sample. As such, using an arbitrary threshold to reclassify the variable into a binary variable would lose valuable information and the results may be sensitive to the threshold chosen. Third, the changes in satisfaction levels across waves are relatively small and the variations would be substantially smaller if a binary satisfaction variable were used, which would make the estimates even less accurate with a fixed effects approach.<sup>7</sup>

To understand the key determinants of youth subjective wellbeing, the first set of happiness functions are estimated, and the model specification is as follows:

$$SW_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 E_{it} + \beta_3 S_{1it} + \beta_4 S_{2it} + Z_{it}' \delta + \alpha_i + \varepsilon_{it} \quad (1)$$

where  $SW_{it}$  is the self-reported subjective wellbeing for individual  $i$  at time  $t$ ;  $D$ ,  $E$ ,  $S_1$  and  $S_2$  refer to disability status, economic participation, active club membership and frequency of contact with friends/relatives, respectively;  $Z$  contains other personal characteristics and contextual variables;  $\alpha_i$  refers to person-specific fixed effects and  $\varepsilon_{it}$  is a random-error term.

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<sup>6</sup> Ferrier-i-Carbonell and Frijters (2004) finds allowing for fixed effects changes results substantially.

<sup>7</sup> In the sample 61 per cent have changes in overall life satisfaction across waves, of whom 90 per cent have a change equal or smaller than two points on the 11-point scale.

The estimation is conducted in stages and the results are reported in Table 2. The base model (Model I.1) only controls for the disability and participation variables. Then the following variables are added: socio-demographic variables (age, health, interaction terms of sex and partnered status, and Socio-Economic Indexes for Areas (SEIFA) disadvantage index) (in Model I.2), socio-economic variables (equivalised household income in 2001 dollars and homeownership) (in Model I.3), and finally a group of other subjective variables (perceived prosperity, financial difficulty and social support) (in Model I.4).<sup>8 9</sup>

To assess how the effects of economic participation on youth wellbeing vary by disability status, an interaction term of economic participation and disability variables ( $D_{it} * E_{it}$ ) is included in the second set of models:

$$SW_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 E_{it} + \beta_3 S_{1it} + \beta_4 S_{2it} + Z_{it}' \delta + \gamma D_{it} * E_{it} + \alpha_i + \varepsilon_{it} \quad (2)$$

where  $\gamma$ , the coefficient of the interaction term  $D_{it} * E_{it}$ , informs the relative importance of economic participation for youth with disability.

Similarly, the third and fourth sets of models include interaction terms for active club membership and disability variables, and frequency of contact with friends/relatives and disability, respectively. Models simultaneously including interaction terms of disability and all participation variables are also estimated and the findings are consistent; however, the results are much more complex and difficult to interpret. Therefore, the paper only reports results of models including one set of interaction terms at a time (see Table 3). The models are estimated with the same sets of control variables in stages in as Table 2; to save space, Table 3 only reports results for key variables in the full model specifications.

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<sup>8</sup> The HILDA data provide several Socio-Economic Indexes for Areas (SEIFA) created by the Australian Bureau of Statistics. This paper uses the 2001 SEIFA Index of Relative Socio-economic Disadvantage. For more information on the SEIFA indexes, refer to [www.abs.gov.au](http://www.abs.gov.au).

<sup>9</sup> Controlling for stressful life events—a few being significant—does not affect the main findings.

**Table 2: Results of fixed effects linear models of determinants of youth happiness**

Explanatory variables	Model I.1	Model I.2	Model I.3	Model I.4
<i>Disability:</i>				
1. Disability with no work limitations (DN)	-0.095	-0.061	-0.062	-0.028
2. Disability with work limitations (DW)	-0.413***	-0.283***	-0.283***	-0.276***
<i>Economic participation:</i>				
1. Full-time working (FTW)	0.122*	0.190***	0.190***	0.157**
2. Part-time working (PTW) and full-time studying (FTS)	0.302***	0.246***	0.241***	0.236***
3. PTW and not FTS	0.244***	0.252***	0.247***	0.248***
4. Unemployed and FTS	0.270**	0.130	0.135	0.124
6. Not in the labour force (NILF) and FTS	0.350***	0.204***	0.202**	0.205***
7. NILF and not FTS	0.256***	0.262***	0.254***	0.258***
<i>Social participation:</i>				
Being an active club member	0.105***	0.044	0.039	0.030
Contact with friends/relatives: 1. Monthly or less	-0.157***	-0.106*	-0.107*	-0.063
2. 2–3 times/month	-0.143***	-0.115**	-0.116**	-0.093*
3. Once a week	-0.015	-0.012	-0.011	-0.012
5. Every day	0.084*	0.044	0.041	0.027
<i>Socio-demographic variables:</i>				
Highest education: 1. Bachelor or above		0.158*	0.180*	0.131
2. Post-school qualification		0.096	0.103	0.087
3. Year 12		0.106*	0.111*	0.098*
Health (SF36)		0.016***	0.016***	0.014***
Age 16		-0.033	-0.033	-0.030
Age 17		-0.212***	-0.207***	-0.221***
Age 18		-0.319***	-0.305***	-0.298***
Age 19		-0.433***	-0.409***	-0.395***
Age 20		-0.493***	-0.463***	-0.450***
Age 21		-0.548***	-0.512***	-0.506***
Age 22		-0.546***	-0.511***	-0.516***
Age 23		-0.586***	-0.551***	-0.534***
Age 24		-0.606***	-0.572***	-0.547***
Partnered		0.303***	0.322***	0.311***
Partnered male		-0.232**	-0.227**	-0.244**
SEIFA disadvantage index: 1. Lowest decile		-0.167*	-0.163*	-0.161*
2. 2 <sup>nd</sup> decile		-0.107	-0.099	-0.086
3. 3 <sup>rd</sup> decile		-0.038	-0.033	-0.033
4. 4 <sup>th</sup> decile		-0.193*	-0.192*	-0.170*
5. 5 <sup>th</sup> decile		-0.106	-0.108	-0.111
6. 6 <sup>th</sup> decile		-0.015	-0.008	-0.002
7. 7 <sup>th</sup> decile		-0.120	-0.118	-0.125
8. 8 <sup>th</sup> decile		-0.067	-0.070	-0.078
10. Highest decile		-0.042	-0.030	-0.041
<i>Socio-economic variables:</i>				
Equivalentised household income: 1. \$12,000–			-0.029	-0.006
2. \$12,000–20,000			0.023	0.041
4. \$30,000–45,000			0.024	0.010
5. \$45,000+			-0.064	-0.079
Homeowner			0.148***	0.127***
<i>Other subjective variables:</i>				
Prosperity				-0.159***
Difficulty in raising \$2,000 in an emergency:				
2. Involve some sacrifice				-0.020
3. Have to do something drastic				-0.079*
4. Could not				-0.127**
Social support				0.097***
Constant	7.813***	7.027***	6.914***	7.068***

<b>Overall R<sup>2</sup></b>	0.0552	0.1722	0.1771	0.2334
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Note: \* Significant at 5%; \*\* Significant at 1%; \*\*\* Significant at 0.1%.

## IV Estimation results

### *(i) Determinants of the wellbeing of youth generally*

This section provides a discussion of the key determinants of the subjective wellbeing of young people as a whole; this establishes the broader context for studying the happiness of young people with disability.

Generally, as shown in Table 2, the level of life satisfaction of young people steadily increases with health and perceived social support, but steadily decreases with age (between 15–24 years), and perceived prosperity (reverse coded from prosperous to very poor) and financial difficulty.

Other significant risk factors for decreased youth wellbeing include work-limited disability, contact with friends/relatives 3 or less times a month, unemployment (especially when not studying full-time), separation/divorce, and living in a socio-economically disadvantaged area.

Conversely, additional protective factors for increased youth wellbeing include contact with friends/relatives several times a week or more, employment (especially part-time), being partnered, having finished Year 12 education, living in an area with relative socio-economic advantage, and homeownership.<sup>10</sup>

Income is not significantly associated with youth wellbeing once age is controlled for.<sup>11</sup> However, perceived prosperity and financial difficulty are consistently significant in all models estimated. The results indicate that young people may care

<sup>10</sup> Interestingly, not being in the labour force is also positively associated with happiness. Some young people in this category may be taking a break from study/work and enjoying life.

<sup>11</sup> Equivalised household disposable income and individual disposable income as well as different functional forms, such as continuous, categorical and natural log, are tested, and none of them is statistically significant. Income is not particularly significant for youth with disability either.

more about whether their specific needs, wants and financial responsibilities—not observed in the data—can be met rather than the actual level of income.

Since this research is based on a fixed effects approach, time-constant control variables such as personality traits (only asked in Wave 5) are excluded. However, in a few specifications of the happiness function, their interaction terms with disability are included to see how the effects of disability vary by personality, which may affect the way people cope with disability. The results (not reported) suggest that: for young people, the higher the score on openness to experience, the more detrimental a non-work-limited disability for happiness; in contrast, the higher the score on agreeableness, the less detrimental a work-limited disability; the effects of the other three personality scales—extroversion, conscientiousness and emotional stability—are not significantly different for different disability groups.<sup>12 13</sup>

In addition, although partnered status is important for the wellbeing of young people as a whole, it is not as important for males as for females. Other things being considered, partnered females are significantly happier than partnered males.

### ***(ii) Interaction of disability and participation***

This section investigates the relative importance of participation for the wellbeing of young people with disability. The last three columns of Table 3 reports results for three models that include interaction terms of disability and economic and social participation; for comparison, its first column copies results of Model I.4 from Table 2. The inclusion of the interaction terms does not significantly affect the coefficients

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<sup>12</sup> When personality traits are controlled for (with a smaller sample), the main conclusions are not affected, and Hausman tests still reject the null hypothesis that random effects models are consistent.

<sup>13</sup> Similar exercises have been undertaken for gender, country of birth and Indigenous status. The onset of a disability with work limitations is more detrimental for males than for females (though not always significant). The results for country of birth and Indigenous status may not be reliable due to small cell numbers in key groups of interest such as Indigenous young people with disability.

of other control variables, which, to save space, are not reported. However, the inclusion does change the interpretation of the related variables, as discussed below.

**Table 3: Results of fixed effects linear models with interaction terms of disability and participation**

<b>Explanatory variables</b>	<b>Model I.4</b>	<b>Model II.4</b>	<b>Model III.4</b>	<b>Model IV.4</b>
<i>Disability:</i>				
Disability with no work limitations (DN)	-0.028	-0.351	-0.020	0.029
Disability with work limitations (DW)	-0.276***	-0.374**	-0.410***	-0.154
<i>Economic participation:</i>				
Full-time working (FTW)	0.157**	0.118	0.154**	0.157**
Part-time working (PTW) and full-time studying (FTS)	0.236***	0.204**	0.234***	0.236***
PTW and not FTS	0.248***	0.198**	0.245***	0.248***
Unemployed and FTS	0.124	0.080	0.122	0.123
Not in the labour force (NILF) and FTS	0.205***	0.172**	0.204***	0.205***
NILF and not FTS	0.258***	0.255***	0.255***	0.254***
<i>Social participation:</i>				
Being an active club member	0.030	0.031	0.010	0.030
Contact with friends/relatives: monthly or less	-0.063	-0.061	-0.061	-0.033
2–3 times/month	-0.093*	-0.093*	-0.093*	-0.092*
Once a week	-0.012	-0.012	-0.012	0.000
Every day	0.027	0.026	0.029	0.048
<i>Interaction terms of disability and economic participation:</i>				
FTW and DN		0.350		
FTW and DW		0.197		
PTW and FTS and DN		0.210		
PTW and FTS and DW		0.202		
PTW and not FTS and DN		0.543*		
PTW and not FTS and DW		0.111		
Unemployed and FTS and DN		0.223		
Unemployed and FTS and DW		0.335		
NILF and FTS and DN		0.397		
NILF and FTS and DW		0.009		
NILF and not FTS and DN		0.268		
NILF and not FTS and DW		-0.105		
<i>Interaction terms of disability and active club membership:</i>				
Active club membership and DN			-0.017	
Active club membership and DW			0.370***	
<i>Interaction terms of disability and frequency of contact with friends/relatives:</i>				
Monthly or less and DN				-0.086
Monthly or less and DW				-0.337*
2–3 times a month and DN				-0.047
2–3 times a month and DW				-0.022
Once a week and DN				-0.136
Once a week and DW				-0.118
Every day and DN				-0.062
Every day and DW				-0.319*
<b>Overall R<sup>2</sup></b>	<b>0.2334</b>	<b>0.2334</b>	<b>0.2334</b>	<b>0.2336</b>

Note: \* Significant at 5%; \*\* Significant at 1%; \*\*\* Significant at 0.1%. Other control variables are the same as in Model I.4 of Table 2 and the results are also very similar.

*Interaction of disability and economic participation:* In Model II.4, the coefficients of the two disability variables show the impact of a disability (with or without work limitations) among young people who are unemployed and not studying full-time—the reference category for economic participation—instead of the whole sample as in Model I.4. Consistently, among this group, the onset of a work-limited disability is still associated with a significantly lower level of happiness, while the effect of a non-work-limited disability is not significant.

Similarly, the coefficients of the economic participation categories show the effects of different participation levels among young people without disability (the reference category for disability). Relative to unemployment, part-time working or not being in the labour force is associated with a significantly higher level of happiness, while full-time working or studying is not.<sup>14</sup>

The coefficients of the interaction terms reveal how different the effects of economic participation are for the wellbeing of youth with disability compared to those without disability. As shown in Model II.4 of Table 3, the interaction term of part-time working and not full-time studying with non-work-limited disability stands out as being significant and positive. It indicates that part-time working is significantly more important among youth with a non-work-limited disability and not in full-time study; the (add-on) effect is also large in size (0.54 points)—more than two times as large as that for youth without disability (0.20 points). All other interaction terms are statistically insignificant.

*Interaction of disability and social participation:* Two social participation factors—active club membership and frequency of contact with friends/relatives—are

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<sup>14</sup> Using a different reference group of economic participation—for example, youth working full-time—does not affect the conclusion.

analysed in this research. Models III.4 and IV.4 in Table 3 provide estimates for models with interaction terms of disability and each of these two factors, respectively.

The results for the interaction terms in Model III.4 indicate that starting an active club membership is associated with a higher level of life satisfaction among young people with work-limited disability by 0.37 more points than among young people without disability, for whom active club membership does not significantly matter. The *total* effects of starting an active club membership (0.38 points) nearly counterbalance the negative impact of the onset of a work-limited disability (0.41 points) on youth happiness. However, among those who have a non-work-limited disability, active club membership is not particularly important for their wellbeing.

In Model IV.4 of Table 3, the results for the interaction terms suggest that reducing the frequency of contact with friends/relatives from several times a week (the reference category) to once a month or less is associated with a significantly lower level of happiness (by 0.34 extra points) among young people with a work-limited disability relative to those without disability, for whom the effect of such a change is insignificant. However, among the same group of young people with work-limited disability, increasing the contact frequency from several times a week to every day is also associated with a significantly lower level of happiness (by 0.32 extra points) relative to their peers without disability, for whom the same increase does not make a significant difference. The results imply more frequent contact is not always better for the wellbeing of young people with work-limited disability; the reasons are not clear and may be related to the nature of disability (more frequent contact may in fact reflect a higher level of dependence due to a more severe disability) and/or the imperfect measure of contact (consisting of contacts with both friends and relatives).

Better measures for disability and participation are needed to understand the relationships better.

In addition, the insignificance of the disability variables in Model IV.4 indicates that among young people who have contact with friends/relatives several times a week, the onset of a disability (with or without work limitations) does not significantly affect their life satisfaction.

To see the relative importance of disability and participation on youth wellbeing against other factors, the size of their effects is compared below in two scenarios.

When the maximum possible effects are considered, health appears to be the most important factor for youth happiness—it has a maximum possible effect of 1.40 points in the scale from 0 to 10 if one's health is improved from the minimum score of 0 to the maximum of 100 (estimated with results of Table 2). The maximum possible effects of perceived prosperity, social support, age and partnered status are also large, 0.80, 0.58, 0.55 and 0.31 points, respectively. All other factors have a maximum possible effect of 0.28 points or less, including, in a decreasing order, disability, economic participation, location, homeownership, financial hardship, achieved education level and social participation.

It should be noted that the scenario provided by the maximum possible effects may be far from realistic. For instance, no one in the sample really changed their health from a score of 0 to 100 between two consecutive interviews.

A closer look at the changes in these factors between consecutive waves shows that the majority of young people in the sample changed their health scores by less than 20 points, and changed their scores of prosperity and social support by just one point. These changes would translate into changes in the level of happiness of 0.28, 0.16, and 0.10 points, respectively. In this more realistic scenario, health remains

fairly important, while perceived prosperity and social support become less important than partnered status, disability and economic participation.

To sum up, economic and social participation is not only significantly more important for the wellbeing of young people with disability than for the general population, the effects are also considerably larger in size (0.37-0.74 points) than most other influencing factors, especially in the second scenario.<sup>15</sup>

Note that causality is not necessarily established using a fixed effects approach. For instance, the negative association between unemployment and a lower level of happiness can imply either unhappy employees are more likely to become unemployed, or unemployment reduces happiness, or both. A comparison between young people who just became unemployed and those who were not unemployed in any two consecutive years shows that at the year prior to unemployment, the two groups were not significantly different in terms of happiness, while after unemployment the former group were significantly less happy than the latter; indicating that causality is more likely to go from unemployment to a lower level of satisfaction, rather than the other way around. But the findings remain inconclusive.

## Conclusions

Based on the first eight waves of the Household, Income and Labour Dynamics in Australia (HILDA) Survey data, this research reveals a negative impact of disability and a positive role of economic and social participation on the subjective wellbeing of young people.

Consistent with existing literature, the paper identifies health, partnered status, age, homeownership, education and location as significant influencing factors for

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<sup>15</sup> Perceived social support is important for both youths with and without disability, but it is significantly more important for the former. One point increase in social support in a scale of one to seven increases the overall life satisfaction by 0.08 *additional* points for youths with work-limited disability relative to those without disability (for whom the estimated effect is 0.09 points).

youth wellbeing. Moreover, partnered females are substantially happier than partnered males, and the impact of disability varies notably by young people's personality traits.

Income is not significantly related to youth wellbeing once age is considered, while perceived prosperity and financial difficulty turn out to be important determinants of youth wellbeing. As such, in this respect income should be considered together with needs, wants and financial responsibilities. Unfortunately, these attributes are not usually directly observed in many datasets.

Most of all, this paper finds that economic and social participation, respectively, is significantly more important for the wellbeing of youth with non-work-limited or work-limited disability. Specifically, relative to otherwise similar young people without disability: for young people with non-work-limited disability who are not studying full-time, working part-time rather than being unemployed is associated with a higher level of subjective wellbeing by 0.54 extra points in a scale from 0 to 10; for young people with work-limited disability, an active club membership is associated with a higher level of wellbeing by 0.37 additional points, and contacting friends/relatives several times a week rather than monthly or less is associated with a higher wellbeing level by 0.34 more points. These add-on effects are large in size, not only considerably larger than the effects of the same participation among youth without disability, but also larger than the estimated effects of any other factors on the wellbeing of young people in the general population (mostly less than 0.30 points).

Overall, findings about lower levels of subjective wellbeing among young people with disability in this research indicate the importance of taking their particular needs into consideration. The results also highlight the importance of economic and social participation as well as social support for the wellbeing of young people with disability, which suggests avenues for enhancing wellbeing among this group.

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## Appendix:

**Table A.1: Statistical summary**

Variable (min–max)	Mean <sup>†</sup>	Happiness <sup>†</sup>
<b>Subjective wellbeing:</b>		
Happiness (0–10)	8.039 (1.39)	
<b>Disability (0–2) :</b>		
0. No disability	0.886	8.102 (1.31) <sup>#</sup>
1. No work limitations	0.058	7.838 (1.69)*
2. With work limitations	0.056	7.241 (1.98)*
<b>Participation:</b>		
<i>Economic participation (1–7) :</i>		
1. Full-time working (FTW)	0.320	7.980 (1.32) <sup>#</sup>
2. Part-time working (PTW) and full-time studying (FTS)	0.222	8.220 (1.17) <sup>*</sup>
3. PTW and not FTS	0.120	7.962 (1.39)
4. Unemployed and FTS	0.038	8.114 (1.42)
5. Unemployed and not FTS	0.044	7.509 (1.85) <sup>*</sup>
6. Not in the labour force (NILF) and FTS	0.190	8.209 (1.33) <sup>*</sup>
7. NILF and not FTS	0.066	7.661 (1.95) <sup>*</sup>
<i>Being an active club member (0–1):</i>		
0. No	0.574	7.887 (1.46) <sup>#</sup>
1. Yes	0.426	8.243 (1.27)*
<i>Frequency of contact with friends/relatives (1–5):</i>		
1. Monthly or less	0.088	7.736 (1.66)*
2. Two or three times a month	0.103	7.736 (1.46)*
3. About once a week	0.257	7.958 (1.36)*
4. Several times a week	0.398	8.099 (1.28) <sup>#</sup>
5. Daily	0.154	8.392 (1.41)*
<b>Socio-demographic variables:</b>		
<i>Sex (1–2):</i>		
1. Male	0.493	8.066 (1.40)*
2. Female	0.507	8.012 (1.38) <sup>#</sup>
Age (15–24 years)	19.245 (2.89)	
<i>Country of birth (1–3):</i>		
1. Australian born	0.857	8.069 (1.40) <sup>#</sup>
2. Main English-speaking countries	0.030	7.875 (1.38)*
3. Born in other countries	0.113	7.850 (1.34)*
<i>Indigenous (0–1):</i>		
0. No	0.966	8.041 (1.37) <sup>#</sup>
1. Yes	0.034	7.959 (1.89)
Health (SF36) (0–100)	73.371 (18.84)	
<i>Health category (1–4):</i>		
1. Excellent	0.213	8.697 (1.14)*
2. Very good	0.419	8.184 (1.19) <sup>#</sup>
3. Good	0.295	7.658 (1.38)*
4. Fair/poor	0.073	6.867 (1.88)*
<i>Highest education level achieved (1–4):</i>		
1. Bachelor or above	0.085	7.923 (1.14)*
2. Post-school qualification	0.153	7.911 (1.42)*
3. Year 12	0.315	7.990 (1.26)*
4. Year 11 or below	0.447	8.138 (1.51) <sup>#</sup>
<i>SEIFA 2001 Index of Relative Socio-Economic Disadvantage (1–10):</i>		
1. Lowest decile	0.093	7.801 (1.58) <sup>*</sup>
2. 2 <sup>nd</sup> decile	0.093	7.928 (1.51) <sup>*</sup>
3. 3 <sup>rd</sup> decile	0.106	8.120 (1.42)
4. 4 <sup>th</sup> decile	0.068	7.923 (1.65) <sup>*</sup>
5. 5 <sup>th</sup> decile	0.089	8.105 (1.36)

6. 6 <sup>th</sup> decile	0.105	8.042 (1.41)
7. 7 <sup>th</sup> decile	0.117	8.106 (1.36)
8. 8 <sup>th</sup> decile	0.091	8.066 (1.27)
9. 9 <sup>th</sup> decile	0.122	8.038 (1.25) <sup>#</sup>
10. Highest decile	0.116	8.167 (1.17) <sup>*</sup>
<b>Socioeconomic variables:</b>		
<i>Homeowner (0–1)<sup>††</sup>:</i>		
0. No	0.343	7.820 (1.52) <sup>*</sup>
1. Yes	0.657	8.152 (1.31) <sup>#</sup>
Equivalentised household income (0–382,778) (annual, in 2001 \$)	29,177.040	(15,945.45)
<i>Equivalentised household income category (1–5):</i>		
1. \$12,000 or less	0.093	7.762 (1.68) <sup>*</sup>
2. \$12,000–20,000	0.196	7.923 (1.55) <sup>*</sup>
3. \$20,000–30,000	0.295	8.052 (1.36) <sup>#</sup>
4. \$30,000–45,000	0.301	8.133 (1.26) <sup>*</sup>
5. More than \$45,000	0.115	8.165 (1.19) <sup>*</sup>
Individual income (0–125,761) (annual, in 2001 \$)	11,206.960	(11,549.79)
<b>Perceived social support, prosperity and financial hardship:</b>		
<i>Social support (1–7):</i>		
1–3. Very little to little	0.087	7.166 (1.83) <sup>*</sup>
4. Some	0.106	7.475 (1.48) <sup>*</sup>
5. Reasonable	0.162	7.726 (1.27) <sup>*</sup>
6. Much	0.285	8.078 (1.16) <sup>*</sup>
7. Great	0.360	8.520 (1.27) <sup>#</sup>
<i>Perceived prosperity (1–6):</i>		
1. Prosperous	0.028	8.759 (1.21) <sup>*</sup>
2. Very comfortable	0.207	8.501 (1.18) <sup>*</sup>
3. Reasonably comfortable	0.510	8.075 (1.25) <sup>#</sup>
4. Just getting along	0.231	7.559 (1.57) <sup>*</sup>
5. Poor	0.019	6.964 (1.92) <sup>*</sup>
6. Very poor	0.005	6.400 (2.57) <sup>*</sup>
<i>Difficulty in raising \$2,000 in an emergency (1–4):</i>		
1. Could easily	0.310	8.204 (1.22) <sup>#</sup>
2. Could, but it would involve some sacrifice	0.274	8.094 (1.28) <sup>*</sup>
3. Would have to do something drastic	0.191	7.848 (1.42) <sup>*</sup>
4. Could not	0.225	7.889 (1.65) <sup>*</sup>
Number of observations (person-wave)	15,709	

Note: <sup>†</sup> Standard deviations in parentheses; responding person weights used.

<sup>††</sup> Homeowner: own/currently paying off mortgage (indicating family wealth, may not be wealth of young people themselves).

<sup>#</sup> Reference category.

<sup>\*</sup> Significantly different from the reference group at the 5% level.