



## Research article

## Job satisfaction dynamics: how do they impact employment mode choice for people with a disability?

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## ABSTRACT

**Background:** To enhance economic participation for people with a disability in the labor market, a better understanding of how job satisfaction influences employment mode decisions is needed.**Methods:** This study uses data collected from 8,345 People with Disability (PWD) workers from waves 3 to 19 of the Household, Income and Labour Dynamics in Australia (HILDA) survey to investigate the relationship between six domains of job satisfaction and employment mode (employee, solo self-employed, and employer) and covariates related to personal, health, socio-economic and employment-related attributes.**Results:** Analysis of 25,169 individual-level observations show important differences in the level of job satisfaction across the different employment modes and for different covariates. PWD entrepreneurs reported higher levels of satisfaction with their work, flexibility, and overall satisfaction, whereas employees report higher levels of contentment with salary, job security, and work hours. The findings also highlight interesting differences due to personal, health, socio-economic and employment related attributes.**Conclusions:** Collectively, these insights can guide policymakers to enhance entrepreneurial pathways for people with a disability.

## 1. Introduction

Improving inclusion for people with a disability (PWD) is an important population health issue. According to the World Health Organization (WHO), over one billion people or around 15% of the world's population live with some form of disability, with this number predicted to double by 2050 [1]. This presents a pressing challenge for governments around the world, with OECD countries already spending around 2% of GDP on disability and related illness benefits [2]. Despite this investment, PWD continue to experience severe disadvantages in education, health and employment [3, 4]. This is consistent with the Australian situation, where despite representing only 18% of the adult population, PWD are statistically more likely to experience psychological distress, discrimination, and poorer health outcomes than people without a disability [5].

Armed with well-established evidence regarding the positive health and wellbeing outcomes that flow from work, a key policy response in developed countries like Australia has been to promote increased labor force participation [6]. An emphasis of this policy response has been removing employment barriers, addressing workplace injustices, and mitigating material disadvantages in order to enhance economic

participation for PWD [2, 5]. An alternative policy response that addresses the persistence of disadvantage and discrimination in the mainstream labor market for PWD is to promote entrepreneurial pathways and self-employment. For example, a nationwide survey in Sweden revealed that entrepreneurs with disability enjoy comparable rates of success to people without a disability [7]. This finding was echoed in a US study which found that PWD were statistically more likely to pursue an entrepreneurial pathway than those without a disability [8]. An Australian qualitative study of entrepreneurs with disability supported these observations, adding that the sustainability of these outcomes was dependent on access to a support ecosystem. This latter study, however, also highlighted a number of challenges associated with pursuing an entrepreneurial pathway including the potential negative impact of this employment mode on health and well-being [9].

The present study will undertake a more granular analysis of the relative merits of different employment pathways for PWD in Australia, with a focus on understanding how satisfaction with different aspects of work is associated with employment mode preference. Recent research indicates that job satisfaction offers useful information regarding employment patterns for PWD [10, 11]. The accumulated evidence

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suggests statistically significant differences in job satisfaction between older self-employed persons with and without a disability in Germany [12], that job satisfaction may be a significant predictor of the decision between self-employment and paid employment [13], and that self-employment rates were higher among PWD serving as a springboard to employership [8, 14].

There is no research to date, however, that specifically explores the association between job satisfaction and employment mode decisions for PWD across the entire working-age population, despite suggestions that such research would be helpful for policymakers [15]. This need appears to be particularly acute in Australia where a dearth of research on employment pathways for PWD workers has been identified as a “national priority” that needs to be addressed to ensure that policy and decision-makers are better informed about the factors that impact entrepreneurial outcomes for PWD [16]. To address this gap, this paper investigates the relationship between employment mode choice (employee, solo self-employed, self-employed with employees) and domains of job satisfaction (pay, job security, working hours, nature of work, job flexibility and overall satisfaction) for PWD. The findings will be useful to governments seeking to enhance entrepreneurial pathways for PWD as a means of increasing labor market participation, and for the implementation of market-side interventions (e.g., wage subsidies) that can address relative job insecurity, working hours and sustainability.

## 2. Materials and methods

### 2.1. Methods

This study utilized the theoretical framework established by Clark and Ostwald to investigate the impact of different employment modes on job satisfaction of impaired workers [17]. This is one of the most widely accepted economic frameworks for investigating the relationship between employment and job satisfaction, highlighting among other things, the highly contextualized nature of this relationship. According to this framework, the total utility reported by an employed person depends on the following functional form:

$$U_{it} = (V_{it}(s, h, p, w), \mu_{it}) \quad i = 1 \dots n; t = 1 \dots T \quad (1)$$

Where,  $U_{it}$  represents the total utility enjoyed by an individual  $i$  at time  $t$ .  $V_{it}(\cdot)$  is a sub utility function that encapsulates the level of well-being derived from all aspects of an individual's job. This work-related utility depends on the level of salary/income  $s$ , the number of working hours  $h$ , person specific (age, gender, health, education etc.) characteristics  $p$ , and work attributes (employment modes, union membership, number of jobs, supervisory responsibilities, job tenures etc)  $w$ . The component  $\mu_{it}$  of the total utility  $U_{it}$  can be thought of all other factors that affect total utility but not work-related utility  $V_{it}(\cdot)$ . This study assumes that  $U_{it}(\cdot)$  is increasing in both argument  $V_{it}(\cdot)$  and  $\mu_{it}$ ; and treats an individual's reported job satisfaction levels as a proxy of the work-related utility data. Section 2.3 Measurements describes the measurements of proxy variables.

### 2.2. Sample

Data for this study were obtained from the Household, Income and Labour Dynamics in Australia (HILDA) longitudinal survey [18]. HILDA survey began in 2001, with data collection commencing each year in July–August and concluding by February–March of the following year. We direct interested readers to Summerfield et al. [19] for further information on the HILDA survey. To ascertain disability status, HILDA presents a showcard to respondents that lists 17 types of disabilities and asks “Do you have any long-term health condition, impairment or disability (such as these) that restricts you in your everyday activities, and has lasted or is likely to last, for 6 months or more?” In addition to data on specific disability type, this approach results in a binary variable

that attributes disability status based on selection of any of the disability types. Accordingly, this study focuses only on respondents with a positive disability indicator who were employed at the time of the survey. Due to inconsistencies in the measurement of disability in the first two waves, the present study evaluates data beginning with wave 3 and continuing until wave 19. This resulted in a total sample size of 8,345 individuals with 25,169 observations distributed over 17 waves with an average of 3.02 observations per person for the analysis.

### 2.3. Measures

#### 2.3.1. Outcome variables

The primary outcome variables of this study were the six domains of job satisfaction covered by the HILDA survey. The interviewer asks the respondent to pick a number between 0 and 10 (0 being totally dissatisfied and 10 being totally satisfied) indicating their level of satisfaction with the following six aspects of their main job: (i) total pay; (ii) job security; (iii) the nature of work (what you do); (iv) hours worked; (v) flexibility available to balance work and non-work commitments; and (vi) overall satisfaction.

#### 2.3.2. Exposure variables

The main outcome of interest in this study is the different employment modes: (i) employee; (ii) solo self-employed; and (iii) employer (self-employed with employees). An employee is an individual who works for wages or salaries. Consistent with prior studies using the HILDA dataset, respondents that do not have employees in their businesses were defined as solo self-employed, and those who have employees in their business were treated as employers in this study [14, 20].

#### 2.3.3. Covariates

Prior research suggests a range of potential covariates for the present study [12, 17, 21, 22]. Consistent with this prior work, the present study took into account *personal attributes*: age, gender, education (year 12 to higher degree), Indigenous identification (yes/no); *health attributes*: self-assessed health (poor to excellent), number of disabilities, work-limiting disability (yes/no); *socio-economic attributes*: income quintile (poorest to richest), socio-economic indexes for areas (SEIFA) quintile (most disadvantaged to most advantaged area), rural residency (yes/no) and home ownership (yes/no); *employment attributes*: supervisory responsibilities (yes/no), union membership (yes/no), multiple job (yes/no), multiple job location (yes/no), job tenure and job hours.

### 2.4. Statistical analysis

The research participants' characteristics and the nature of work satisfaction domains were studied using descriptive statistics. The outcome variables of interest (domains of job satisfaction) were interpreted as ordinal. In such situations, the random effects ordered probit model for regression analysis is recommended [23, 24]. The regression analysis (econometric model of six distinct domains of job satisfaction) is used to estimate the probabilities of job satisfaction levels for different employment modes, and the question of whether job satisfaction levels for PWD differ between employee, self-employed, and employers is explored.

### 2.5. Ethics

This study did not require ethical approval as the analysis used only de-identified existing unit record secondary data from the HILDA survey. To access the dataset, users are required to sign a Confidentiality Deed Poll. This ensures that the datasets analyzed and/or generated during the current study were subject to the highest ethical standards, and that above all, that the rights to confidentiality and privacy afforded to the participants at the time of data collection by the Melbourne Institute for Applied Economic and Social Research at the University of Melbourne

are protected (Ethics ID no. 1647030). The HILDA survey asks and records answers to many highly-sensitive questions, including people's incomes, earnings, drug and alcohol use, psychological problems, victimization, and sexual orientation, under a guarantee to subjects that their responses will be kept confidential. This study is based on the 'general release' version of the data which is only available to researchers inside and outside Australia who sign deeds with the Department of Social Services that commits them to storing, handling, and using the data securely and to destroying the data after use. This version of the data removes all direct (e.g., name) and indirect personal details (e.g., detailed geographic codes, date of birth) to ensure that subjects cannot be identified.

### 3. Results

#### 3.1. Descriptive statistics

Table 1 reports a summary of this descriptive analysis. The average age was 45 years. The sample was also gender-balanced with men representing 50.5% and women accounting for 49.5% of the total sample. The majority of sample respondents described their health as good or better (44% good, 23.6% very good, and 3.8% exceptional), whereas 24.5% and 4.1% reported their health as fair or poor, respectively. Approximately half (52.6 percent) of the sample reported having a work-limiting disability and approximately 40% of the sample reported more than one disability.

Bivariate analysis was used to investigate how the sample characteristics varied across the six domains of job satisfaction (see Table 2). According to this analysis, the average job satisfaction rating was 6.78, 7.62, 7.08, 7.57, 7.43, and 7.52 for compensation, security, work hours, nature of work, flexibility, and overall satisfaction, respectively. One interesting observation from the data presented in Table 2 is that job satisfaction across all domains seemed to get worse as reported self-assessed health status got worse. A similar observation was made in relation to work-limiting disability. Differences were also observed in relation to employment mode, with employees reporting higher than average satisfaction with their pay (6.91), security (7.67), and work hours (7.11), and self-employed workers reporting higher than average satisfaction for the nature of work (7.91), work flexibility (8.04) and overall satisfaction (7.67). With the exception of pay and work hours satisfaction, employers reported higher than average satisfaction levels in all other domains.

To provide a preliminary assessment of the relationship between job satisfaction and employment mode, an historical trend analysis was undertaken for the six domains of job satisfaction and the different employment modes (see Figure 1). This analysis shows how the mean level for each of the six job satisfaction domains varies by employment state over the 17 waves of the HILDA dataset. The first three panels (upper) illustrate the historical trends for compensation, job security, and hours worked satisfaction, while the second three panels (lower) illustrate changes in the nature of work, work flexibility, and overall job satisfaction.

In the case of pay satisfaction, there was a clear difference across the three employment modes with employees reporting higher average pay satisfaction over employers and self-employed workers. Similarly, both employer and employee had higher average satisfaction with job security than self-employed persons. Employers and self-employed workers reported consistently higher levels of satisfaction than employees with the nature of work, work flexibility, and overall job satisfaction over all waves.

#### 3.2. Regression analysis

Table 3 reports the results for the six random effects ordered probit models associated with the different domains of job satisfaction. The

Table 1. Background characteristics of the study participants.

Variables	N	Mean	Std. Error
<i>Personal attributes</i>			
Age	25,169	44.96	0.091
<i>Gender</i>			
Male	12,722	0.505	0.003
Female	12,447	0.495	0.003
<i>Education</i>			
Year 12 or below (ref.)	9,519	0.378	0.003
Certificates/Diploma	9,214	0.366	0.003
Bachelor or higher	6,436	0.256	0.003
<i>Indigenous identification</i>			
No (ref.)	24,616	0.978	0.001
Yes	553	0.022	0.001
<i>Health Attributes</i>			
<i>Self-Assessed Health</i>			
Excellent (ref.)	948	0.038	0.001
Very good	5,949	0.236	0.003
Good	11,067	0.440	0.003
Fair	6,166	0.245	0.003
Poor	1,039	0.041	0.001
Number of Disabilities	25,169	1.765	0.008
<i>Work-limiting disability</i>			
No (ref.)	11,934	0.474	0.003
Yes	13,235	0.526	0.003
<i>Socio-economic attributes</i>			
<i>Household Income quintile</i>			
Poorest (ref.)	6,293	0.250	0.003
Poorer	5,051	0.201	0.003
Middle	4,738	0.188	0.003
Richer	4,615	0.183	0.002
Richest	4,472	0.178	0.002
<i>IRSAD index for areas</i>			
Most disadvantaged area (ref.)	6,079	0.242	0.003
Disadvantaged area	5,235	0.208	0.003
Average area	5,045	0.200	0.003
Advantaged area	4,602	0.183	0.002
Most advantaged area	4,208	0.167	0.002
<i>Rural resident</i>			
No (ref.)	21,277	0.845	0.002
Yes	3,892	0.155	0.002
<i>House owner</i>			
No (ref.)	7,351	0.292	0.003
Yes	17,818	0.708	0.003
<i>Employment attributes</i>			
<i>Supervise others</i>			
No (ref.)	14,725	0.585	0.003
Yes	10,444	0.415	0.003
<i>Union membership</i>			
No (ref.)	18,684	0.742	0.003
Yes	6,485	0.258	0.003
<i>Multiple jobs</i>			
No (ref.)	23,161	0.920	0.002
Yes	2,008	0.080	0.002
<i>Multiple job location</i>			
No (ref.)	10,522	0.418	0.003
Yes	14,647	0.582	0.003
Job tenure	25,169	8.626	0.063
Job hours	25,169	34.50	0.100
<i>Employment modes</i>			

(continued on next page)

Table 1 (continued)

Variables	N	Mean	Std. Error
Employee (ref.)	20,380	0.810	0.003
Self-employed	2,751	0.109	0.002
Employer	2,038	0.081	0.002

Key: (ref.): Reference group, Std. Error: Standard Error.

parameter estimates in relation to the impact of employment mode for all six domains of job satisfaction were statistically significant at the 1% level or lower except for self-employed on overall job satisfaction that was significant at the 10% level.

Self-employed and employer had a lower likelihood of higher level of satisfaction than employees for pay (self-employed: -0.483, employer: -0.295), security (self-employed: -0.288, employer: -0.130), and hours of work (self-employed: -0.197, employer: -0.130). On the contrary, self-employed and employer had a higher likelihood of higher level of satisfaction than employees for the nature of work (self-employed: 0.194, employer: 0.163), work flexibility (self-employed: 0.299, employer: 0.324), and overall satisfaction (self-employed: 0.067, employer: 0.165).

Satisfaction across the six domains appeared sensitive to some of the personal attributes. We found that age was negatively associated with overall satisfaction (-0.028) and satisfaction with pay (-0.027), security (-0.040), work (-0.014). The older adults seem to have lower probability of high satisfaction scores in these domains. However, as age has been found to have a non-linear impact in regression models, we also examined age-squared which was found to be positively associated with pay (0.0004), security (0.0005), hours (0.0002), work (0.0003) and overall satisfaction (0.0005). Thus, as individuals get older, the effects on satisfaction score in these domains gets stronger. Similarly, gender was also positively associated with some domains of satisfaction, with female workers satisfied with pay (0.053), security (0.158), work (0.088), and overall satisfaction (0.102). Interestingly, satisfaction with flexibility for female workers was negative (-0.053). The link between education level and job satisfaction was not clear in our study. We found that certificates/diploma holders had significantly lower pay (-0.093) satisfaction than other education groups, and bachelor and higher degree holders had significantly lower security (-0.097) and overall satisfaction (-0.157) than other groups.

With respect to health attributes, lower reported self-assessed health is associated with lower levels of satisfaction across all domains. Those who were limited from working due to a disability reported lower levels of satisfaction in all six job satisfaction domains (pay: -0.057, security: -0.065, hours: -0.086, work: -0.076, flexibility: -0.80 and overall satisfaction: -0.096). This association appeared to dampen for some areas of job satisfaction as the number of disabilities increased, with the levels of satisfaction was observed to reduce for overall satisfaction (-0.020) and satisfaction with pay (-0.026) and job security (-0.024).

Interesting findings were also observed in relation to socio-economic attributes, with wealth asymptotically related to satisfaction with pay, security, and flexibility for workers. However, homeowners were usually less satisfied with hours (-0.040), work (-0.050) and flexibility (-0.043) satisfaction. We also found only work and overall satisfaction were statistically significant with more advantageous areas with less satisfaction. Those who identified as Indigenous usually had higher satisfaction levels on pay (0.182), security (0.186), work (0.382) and overall (0.363) satisfaction. Similarly, rural residents had higher satisfaction levels on security, hours (0.060) and overall satisfaction (0.093).

Statistically significant relationships were also observed in relation to employment attributes. For example, having supervisory responsibilities appeared to increase satisfaction with job security (0.235) and the nature of work (0.079), but decreased satisfaction with hours worked (-0.077). Similarly, union membership was positively associated with pay satisfaction (0.064), but negatively associated with satisfaction with security (-0.047), work (-0.066), flexibility (-0.229) and overall satisfaction (-0.093). Not surprisingly, as the number of jobs increased so too did

overall satisfaction (-0.069) and concerns with job security (-0.089). Likewise, as the number of locations that a person worked at increased, dissatisfaction with job security (-0.087), work (-0.108), flexibility (-0.079) and overall satisfaction (-0.052) also decreased. Curiously, we also found job tenures only slightly reduced overall satisfaction (-0.004) and satisfaction with work (-0.005); and longer job hours only had a marginal effect on overall satisfaction (-0.006) and satisfaction with pay (-0.002), hours (-0.012), flexibility (-0.023).

To tease out the differences across the levels of satisfaction for the different employment modes, we also analyzed the marginal effects (see Table 4). The data in this table shows that solo self-employed were 4.5%, 4.2% and 5% less likely to report pay satisfaction level than employees at ratings 8, 9 and 10 respectively. Solo self-employed were also 2% and 6.1% less likely to report a rating of 9 and 10 for job security, and 1.9% and 3% less likely to report a rating of 9 and 10 for work hours. On the contrary, for the nature of work, work flexibility and overall satisfaction, solo self-employed were 3.5%, 6.5% and 1% more likely to report a job satisfaction rating 10 respectively. Table 4 also showed that employers were 3.3%, 2.9% and 2% less likely to report a rating of 10 on satisfaction with pay, job security and hours worked than employees. Similarly, employers were 2.9%, 7.1% and 2.5% more likely to report a rating of 10 on nature of work, work flexibility and overall satisfaction.

#### 4. Discussion

This paper presents the first comprehensive analysis of how job satisfaction for employees with disability in Australia varied according to employment mode and covariates associated with personal, health, socio-economic, and employment attributes. Using data from a longitudinal survey of Australian workers, the results reveal that job satisfaction levels of PWD are universally high (above seven on the scale of ten) in all domains of job satisfaction except pay satisfaction. The most striking finding to emerge from the study is that both solo self-employed workers and those with employees have substantially higher satisfaction ratings for the nature of work, flexibility in the work and overall job satisfaction compared with employees, whereas employees are more satisfied with salary, job security, and work hours. Though some interesting caveats were observed, these findings were persistent even after controlling for personal, health, socio-economic and employment-related attributes.

This study makes several contributions to theory regarding the factors that are associated with job satisfaction for workers. First, the study responds to a call for more research into how employment mode decisions are related to job satisfaction across the working-age population of PWD, and for more research into the drivers of self-employment among Australian workers with disability [15, 16]. The findings of this study add to the literature by extending the work of Pagán who examined the impact of a composite measure of overall job satisfaction across a sample of older and workers without disability [25]. The findings of the present study reinforce the importance of unpacking job satisfaction based on the different aspects of the working experiences of PWD, highlighting clear distinctions in the nature of job satisfaction based on employment mode and individual and context-specific differences.

The findings of the present study are mostly consistent with the prior work of Hundley who examined the relationship between job satisfaction and employment mode among workers without disability in the United States [26]. The strong similarity with our study suggests that self-employed PWD are more similar to entrepreneurs without disability than they are to employees with disability, with our findings showing strong consistency in terms of overall satisfaction, nature of work (autonomy, complexity, skill utilization) and flexibility (variety, flexibility). This observation concurs with other studies that have confirmed that overall satisfaction appears higher for self-employed persons over employees, irrespective of disability status [11, 27, 28, 29, 30].

One interpretation of this finding is that entrepreneurial employment mode decisions are linked to underlying traits of the individual rather than circumstance (i.e., avoiding discrimination). This is consistent with

**Table 2.** Bivariate analysis of different aspect of job satisfaction by sample characteristics.

Variables	Pay	Security	Hours	Work	Flexibility	Overall
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
<i>Personal attributes</i>						
<b>Gender</b>						
Male	6.75 (2.25)	7.56 (2.34)	7.02 (2.14)	7.56 (1.88)	7.39 (2.35)	7.48 (1.83)
Female	6.81 (2.32)	7.69 (2.36)	7.13 (2.22)	7.57 (1.99)	7.47 (2.39)	7.56 (1.86)
<b>Education</b>						
Year 12 or below	6.76 (2.36)	7.71 (2.30)	7.12 (2.25)	7.52 (2.02)	7.52 (2.39)	7.59 (1.92)
Certificates/Diploma	6.64 (2.28)	7.55 (2.37)	7.05 (2.16)	7.59 (1.90)	7.34 (2.40)	7.49 (1.84)
Bachelor or higher	6.99 (2.14)	7.60 (2.39)	7.05 (2.13)	7.60 (1.84)	7.42 (2.29)	7.45 (1.72)
<b>Indigenous identification</b>						
No	6.78 (2.28)	7.62 (2.35)	7.08 (2.18)	7.56 (1.93)	7.44 (2.36)	7.52 (1.84)
Yes	6.86 (2.42)	7.79 (2.34)	6.85 (2.39)	7.69 (2.11)	7.2 (2.66)	7.65 (2.08)
<i>Health Attributes</i>						
<b>Self-Assessed Health</b>						
Excellent	7.34 (2.16)	8.29 (2.04)	7.52 (2.13)	7.95 (1.89)	7.94 (2.25)	8.00 (1.77)
Very good	7.08 (2.12)	7.97 (2.12)	7.38 (2.04)	7.80 (1.77)	7.68 (2.21)	7.82 (1.62)
Good	6.79 (2.23)	7.62 (2.29)	7.07 (2.13)	7.53 (1.90)	7.40 (2.34)	7.50 (1.80)
Fair	6.48 (2.40)	7.32 (2.52)	6.81 (2.30)	7.41 (2.04)	7.21 (2.48)	7.29 (1.96)
Poor	6.14 (2.71)	6.87 (2.97)	6.56 (2.58)	7.19 (2.32)	7.14 (2.80)	6.92 (2.36)
<b>Work-limiting disability</b>						
No	6.97 (2.16)	7.80 (2.21)	7.20 (2.10)	7.64 (1.85)	7.47 (2.31)	7.63 (1.74)
Yes	6.61 (2.38)	7.47 (2.47)	6.96 (2.25)	7.50 (2.00)	7.39 (2.42)	7.42 (1.92)
<i>Socio-economic attributes</i>						
<b>Household Income quintile</b>						
Poorest	6.34 (2.54)	7.38 (2.52)	7.00 (2.37)	7.58 (2.06)	7.56 (2.39)	7.53 (2.01)
Poorer	6.57 (2.29)	7.55 (2.36)	7.04 (2.18)	7.54 (1.92)	7.38 (2.39)	7.45 (1.89)
Middle	6.78 (2.21)	7.64 (2.29)	7.08 (2.14)	7.49 (1.93)	7.30 (2.38)	7.44 (1.80)
Richer	7.05 (2.07)	7.77 (2.23)	7.11 (2.08)	7.56 (1.89)	7.38 (2.33)	7.52 (1.75)
Richest	7.33 (2.01)	7.88 (2.25)	7.19 (2.08)	7.66 (1.80)	7.50 (2.34)	7.65 (1.67)
<b>IRSAD index for areas</b>						
Most disadvantaged	6.70 (2.35)	7.52 (2.38)	7.06 (2.25)	7.60 (2.01)	7.34 (2.43)	7.55 (1.93)
Disadvantaged	6.66 (2.34)	7.64 (2.38)	7.04 (2.25)	7.58 (2.00)	7.39 (2.41)	7.52 (1.88)
Average	6.71 (2.29)	7.62 (2.38)	7.01 (2.16)	7.53 (1.87)	7.4 (2.40)	7.45 (1.84)
Advantaged	6.83 (2.23)	7.63 (2.35)	7.12 (2.14)	7.55 (1.89)	7.48 (2.31)	7.51 (1.78)
Most advantaged	7.06 (2.14)	7.76 (2.26)	7.18 (2.10)	7.56 (1.86)	7.59 (2.24)	7.56 (1.73)
<b>Rural resident</b>						
No	6.80 (2.26)	7.60 (2.36)	7.06 (2.20)	7.54 (1.95)	7.40 (2.37)	7.49 (1.85)
Yes	6.63 (2.38)	7.74 (2.82)	7.19 (2.11)	7.73 (1.83)	7.58 (2.34)	7.67 (1.81)
<b>House owner</b>						
No	6.55 (2.38)	7.49 (2.45)	6.94 (2.27)	7.47 (2.09)	7.37 (2.44)	7.41 (1.96)
Yes	6.87 (2.23)	7.68 (2.31)	7.13 (2.15)	7.60 (1.86)	7.46 (2.34)	7.56 (1.79)
<i>Employment attributes</i>						
<b>Supervise others</b>						
No	6.75 (2.36)	7.38 (2.46)	7.19 (2.20)	7.52 (1.99)	7.58 (2.33)	7.53 (1.90)
Yes	6.82 (2.16)	7.97 (2.14)	6.91 (2.16)	7.63 (1.84)	7.21 (2.41)	7.50 (1.76)
<b>Union membership</b>						
No	6.70 (2.35)	7.60 (2.38)	7.10 (2.20)	7.60 (1.94)	7.60 (2.32)	7.56 (1.87)
Yes	7.01 (2.06)	7.69 (2.27)	7.01 (2.13)	7.47 (1.90)	6.93 (2.44)	7.40 (1.76)
<b>Multiple jobs</b>						
No	6.79 (2.27)	7.65 (2.34)	7.08 (2.18)	7.56 (1.93)	7.43 (2.36)	7.53 (1.83)
Yes	6.58 (2.37)	7.34 (2.50)	6.99 (2.31)	7.59 (2.00)	7.41 (2.48)	7.36 (1.92)
<b>Multiple job location</b>						
No	6.59 (2.44)	7.63 (2.41)	7.09 (2.25)	7.75 (1.88)	7.73 (2.29)	7.64 (1.87)
Yes	6.91 (2.15)	7.62 (2.31)	7.06 (2.14)	7.43 (1.96)	7.21 (2.40)	7.43 (1.82)
<b>Employment modes</b>						
Employee	6.91 (2.18)	7.67 (2.30)	7.11 (2.16)	7.48 (1.96)	7.31 (2.40)	7.47 (1.85)
Self-employed	6.02 (2.61)	7.14 (2.68)	6.99 (2.29)	7.91 (1.78)	8.04 (2.14)	7.67 (1.84)
Employer	6.51 (2.28)	7.83 (2.30)	6.84 (2.26)	7.94 (1.71)	7.84 (2.20)	7.80 (1.70)
All (total)	6.78 (2.28)	7.62 (2.35)	7.08 (2.18)	7.57 (1.93)	7.43 (2.37)	7.52 (1.84)

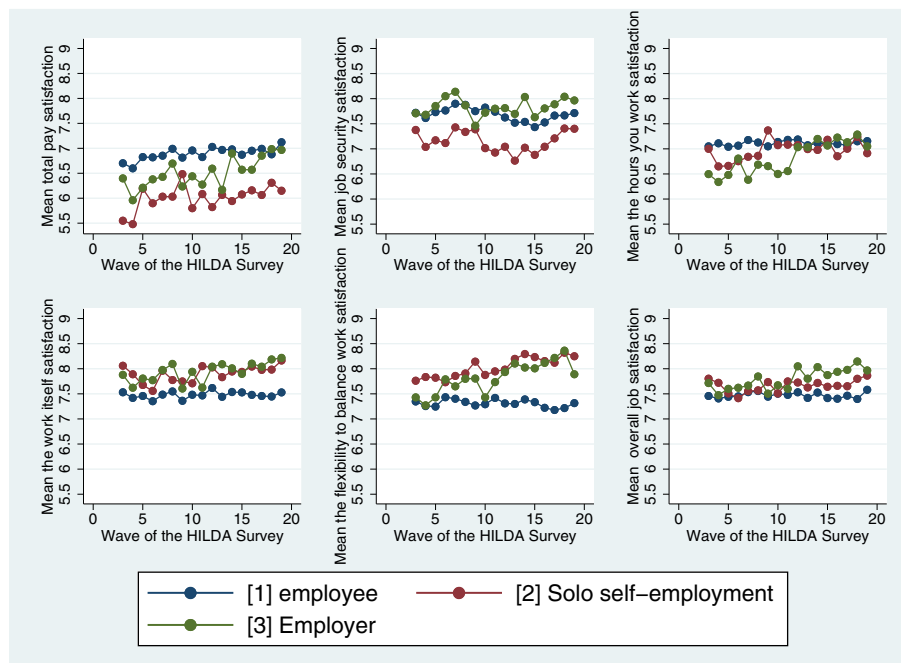


Figure 1. Mean job satisfaction levels by wave and employment mode.

prior research which claims that self-employed persons enjoy higher job satisfaction due to the autonomy to employ internal qualities such as creativity, optimism, and self-efficiency, and that this is also true for workers with disability as they seek to have more control to set their adapt their work design to meet their personal needs, ability and preferences than employees [11, 31]. This is an important insight for policymakers as this finding suggests that it may be more effective to develop support programs that are embedded within mainstream entrepreneurial ecosystems rather than trying to embed such support within specialized disability employment support programs. This is especially true in the Australian welfare setting, where disability employment service providers are incentivized by the government to promote mainstream employment pathways, with little to no support available to assist entrepreneurs with disability [9].

Interestingly, some notable differences were observed between the findings of the present study and the work of Hundley in relation to job security and remuneration [26]. This research found that self-employed workers without disability experienced greater job security (lower job loss likelihood, job availability) than employees [26]. This was not the case for entrepreneurs with disability in our sample. In the present study, it was observed that employees with disability were more satisfied with their job security and remuneration than self-employed PWD. This distinction is also supported by prior work that shows how self-employment can be a double-edged sword, with autonomy and flexibility coming at the pay, working hours, and security [13, 21, 32]. Recent research using the general social survey data from the US also supports this view, with the satisfaction of self-employed and employers found to be impacted by longer working time, increased workload, lower relative wages, work stress, and uncertainty with labor market conditions [4]. However, the differences were not as profound as those observed in the present study.

It could also be that our findings reflect structural differences in the Australian and US labor markets. There is a long history of protectionism in Australia with the work rights of both employees with and without disability enshrined in legislation, including laws that prevent discrimination in pay and conditions for PWD [33, 34]. This explanation is supported by the latest report of the International Trade Union Confederation into worker's rights, with the US rated worse than Australia in terms of protection against systemic violation of worker rights [35].

It is also noteworthy that in Australia (as in most developed countries), such protections do not extend to the self-employed, and it is generally harder to detect more indirect forms of discrimination [16, 36]. For instance, selection bias in the allocation of business opportunities could also explain differences in satisfaction with pay and security for PWD and entrepreneurs without disability. Future research should seek to address this important question and explicitly examine differences among PWD and employees without disability across the domains of satisfaction for different employment modes.

The present study also extends the work of Pagán who investigated how satisfaction levels varied for older workers with a disability in 11 European countries [11]. In addition to exploring this relationship in a non-European context, the present study expands this earlier work by considering job satisfaction across the entire working-age range. The findings of the present study reveal a negative association between age and job satisfaction, for PWD, particularly in relation to security, pay and overall satisfaction. The strength of these associations was also reinforced by the significance of age-squared, suggesting the presence of a non-linear relationship that rises in the middle working years before dropping off in later working years. This is contrary to the findings of Pagán who found that older workers with disability were more likely to be satisfied with job characteristics such as wages and job tenure than workers without disability [37].

These findings should encourage policymakers to think differently about resourcing for jobseekers with disability, and in particular, to tailor support based on cohort differences rather than adopting a one-size-fits-all approach. For instance, if governments are seeking to enhance entrepreneurial pathways for PWD as a means of increasing labor market participation, they will need to consider appropriate market-side interventions (e.g., wage subsidies) that can address relative job insecurity, working hours and sustainability; with attention given to tailoring these interventions to the disadvantages experienced by different cohorts (e.g., younger PWD). It is noteworthy that Australia is moving in the opposite direction by opting for more generic support models where unemployed PWD will only have access to limited digital support services.

In addition to age-related differences, the present findings also reveal interesting differences in health attributes: the extent to which a disability was work-limiting, and the total number of disabilities significantly reducing all aspects of job satisfaction. These findings are in line with

**Table 3.** Job satisfaction regression.

Variables	Pay		Security		Hours		Work		Flexibility		Overall	
	Coeff.	Z	Coeff.	Z	Coeff.	Z	Coeff.	Z	Coeff.	Z	Coeff.	Z
<i>Personal attributes</i>												
Age	-0.027	-5.52***	-0.040	-8.22***	-0.003	-0.72	-0.014	-2.92***	0.004	0.75	-0.028	-5.80***
Age squared	0.0004	7.56***	0.0005	8.42***	0.0002	4.31***	0.0003	6.15***	0.0001	0.98	0.0005	9.14***
Female	0.053	1.97**	0.158	5.79***	-0.001	-0.03	0.088	3.29***	-0.053	-2.00**	0.102	3.81***
<i>Education</i>												
Year 12 or below (ref.)												
Certificates/Diploma	-0.093	-3.24***	-0.047	-1.57	-0.023	-0.82	0.033	1.12	-0.016	-0.54	-0.048	-1.63*
Bachelor or higher	-0.030	-0.88	-0.097	-2.74***	-0.043	-1.34	0.005	0.16	-0.006	-0.17	-0.157	-4.72***
<i>Indigenous identification</i>												
No (ref.)												
Yes	0.182	2.17**	0.186	2.21**	0.018	0.23	0.382	4.42***	-0.057	-0.67	0.363	3.99***
<i>Health Attributes</i>												
<i>Self-Assessed Health</i>												
Excellent (ref.)												
Very good	-0.131	-2.57***	-0.191	-3.85***	-0.156	-3.23***	-0.182	-3.74***	-0.199	-3.89***	-0.197	-3.91***
Good	-0.253	-4.93***	-0.325	-6.43***	-0.337	-6.76***	-0.379	-7.57***	-0.364	-6.97***	-0.420	-8.02***
Fair	-0.353	-6.54***	-0.425	-7.96***	-0.470	-8.92***	-0.481	-9.14***	-0.458	-8.39***	-0.563	-10.27***
Poor	-0.407	-5.89***	-0.527	-7.50***	-0.570	-8.15***	-0.538	-7.81***	-0.512	-7.16***	-0.668	-9.36***
Number of Disabilities	-0.026	-3.33***	-0.024	-3.04***	-0.004	-0.51	-0.007	-0.83	-0.012	-1.48	-0.020	-2.52***
<i>Work-limiting disability</i>												
No (ref.)												
Yes	-0.057	-3.05***	-0.065	-3.41***	-0.086	-4.68***	-0.076	-4.08***	-0.080	-4.36***	-0.096	-5.10***
<i>Socio-economic attributes</i>												
<i>Household Income quintile</i>												
Poorest (ref.)												
Poorer	0.086	3.38***	0.051	2.01**	0.056	2.21**	0.015	0.57	0.058	2.19**	0.014	0.55
Middle	0.144	5.02***	0.079	2.82***	0.112	4.07***	-0.012	-0.44	0.064	2.26**	0.016	0.57
Richer	0.238	7.77***	0.091	2.94***	0.127	4.40***	0.018	0.60	0.100	3.36***	0.042	1.40
Richest	0.330	10.08***	0.111	3.30***	0.128	4.15***	0.006	0.19	0.126	3.88***	0.069	2.16**
<i>IRSD index for areas</i>												
Most disadvantaged area (ref.)												
Disadvantaged area	-0.027	-0.80	0.031	0.95	0.024	0.77	-0.009	-0.27	0.034	1.04	-0.013	-0.41
Average area	-0.044	-1.28	-0.025	-0.70	-0.021	-0.67	-0.084	-2.52**	-0.002	-0.05	-0.102	-3.04***
Advantaged area	-0.012	-0.33	-0.037	-1.05	-0.005	-0.16	-0.071	-2.01**	0.010	0.30	-0.087	-2.51***
Most advantaged area	0.030	0.77	0.016	0.41	0.010	0.30	-0.121	-3.22***	0.009	0.25	-0.125	-3.41***
<i>Rural resident</i>												
No (ref.)												
Yes	0.027	0.74	0.081	2.27**	0.060	1.84*	0.050	1.43	0.054	1.49	0.093	2.62***
<i>House owner</i>												
No (ref.)												
Yes	0.035	1.37	0.032	1.27	-0.040	-1.72*	-0.050	-2.06**	-0.043	-1.72*	-0.022	-0.92
<i>Employment attributes</i>												
<i>Supervise others</i>												
No (ref.)												
Yes	-0.026	-1.26	0.235	11.19***	-0.077	-3.89***	0.079	3.80***	-0.025	-1.22	0.015	0.71
<i>Union membership</i>												
No (ref.)												
Yes	0.064	2.59***	-0.047	-1.80*	-0.063	-2.72	-0.066	-2.70***	-0.229	-9.05***	-0.093	-3.80***
<i>Multiple jobs</i>												
No (ref.)												
Yes	-0.058	-1.73*	-0.089	-2.71***	0.057	1.72*	0.023	0.68	0.045	1.25	-0.069	-2.08**
<i>Multiple job location</i>												
No (ref.)												
Yes	0.008	0.34	-0.087	-3.73***	-0.019	-0.85	-0.108	-4.63***	-0.079	-3.39***	-0.052	-2.22**
Job tenure	0.002	1.21	0.010	7.36	-0.0003	-0.30	-0.005	-3.68***	-0.0006	-0.43	-0.004	-2.65***
Job hours	-0.002	-2.80***	0.004	4.46	-0.012	-13.89***	0.0005	0.57	-0.023	-27.52***	-0.006	-7.21***

(continued on next page)

Table 3 (continued)

Variables	Pay		Security		Hours		Work		Flexibility		Overall	
	Coeff.	Z	Coeff.	Z	Coeff.	Z	Coeff.	Z	Coeff.	Z	Coeff.	Z
Employment modes												
Employee (ref.)												
Self-employed	-0.483	-10.82***	-0.288	-6.73***	-0.197	-5.12***	0.194	4.54***	0.299	7.11***	0.067	1.63*
Employer	-0.295	-5.99***	-0.130	-2.82***	-0.130	-3.13***	0.163	3.64***	0.324	7.23***	0.165	3.79***

Key: (ref.): Reference group, Coeff.: Coefficients, \*P < 0.1, \*\*P < 0.05, \*\*\*P < 0.01.

Table 4. Job satisfaction marginal effects by employment modes.

	Pay	Security	Hours	Works	Flexibility	Overall
1. Self-employed	Dy/Dx (Z)	Dy/Dx (Z)	Dy/Dx (Z)	Dy/Dx (Z)	Dy/Dx (Z)	Dy/Dx (Z)
0	0.020 (7.93)	0.010 (5.63)	0.004 (4.29)	-0.002 (-4.74)	-0.007 (-7.74)	-0.001 (-1.69)
1	0.012 (8.32)	0.006 (5.82)	0.004 (4.51)	-0.002 (-4.61)	-0.005 (-7.46)	-0.001 (-1.67)
2	0.019 (9.09)	0.009 (5.98)	0.007 (4.70)	-0.004 (-4.82)	-0.009 (-7.54)	-0.001 (-1.68)
3	0.023 (9.92)	0.010 (6.15)	0.009 (4.83)	-0.006 (-4.76)	-0.009 (-7.43)	-0.002 (-1.67)
4	0.018 (10.31)	0.008 (6.31)	0.009 (4.98)	-0.006 (-4.72)	-0.010 (-7.34)	-0.002 (-1.66)
5	0.028 (11.52)	0.016 (6.64)	0.014 (5.19)	-0.012 (-4.64)	-0.017 (-7.11)	-0.004 (-1.65)
6	0.017 (13.72)	0.010 (6.96)	0.009 (5.48)	-0.010 (-4.49)	-0.012 (-6.79)	-0.004 (-1.63)
7	0.001 (0.45)	0.012 (7.61)	0.005 (6.74)	-0.013 (-4.24)	-0.014 (-6.31)	-0.005 (-1.59)
8	-0.045 (-9.43)	0.002 (3.39)	-0.011 (-4.47)	0.002 (3.56)	-0.002 (-2.14)	0.002 (1.88)
9	-0.042 (-11.19)	-0.021 (-6.03)	-0.019 (-5.08)	0.018 (4.72)	0.019 (7.96)	0.008 (1.64)
10	-0.050 (-12.72)	-0.061 (-7.20)	-0.030 (-5.45)	0.035 (4.30)	0.065 (6.72)	0.009 (1.60)
2. Employer						
0	0.011 (4.89)	0.004 (2.6)	0.002 (2.81)	-0.002 (-3.87)	-0.007 (-8.03)	-0.002 (-4.01)
1	0.007 (5.18)	0.003 (2.64)	0.002 (2.86)	-0.002 (-3.84)	-0.005 (-7.64)	-0.002 (-3.94)
2	0.011 (5.38)	0.004 (2.68)	0.005 (2.96)	-0.003 (-3.85)	-0.010 (-7.7)	-0.003 (-3.99)
3	0.014 (5.68)	0.004 (2.71)	0.006 (3.01)	-0.005 (-3.82)	-0.010 (-7.58)	-0.004 (-3.97)
4	0.011 (5.84)	0.003 (2.75)	0.006 (3.06)	-0.005 (-3.76)	-0.010 (-7.51)	-0.005 (-3.95)
5	0.018 (6.19)	0.007 (2.8)	0.009 (3.14)	-0.010 (-3.72)	-0.018 (-7.29)	-0.010 (-3.88)
6	0.012 (6.91)	0.005 (2.86)	0.006 (3.27)	-0.009 (-3.61)	-0.013 (-6.92)	-0.009 (-3.78)
7	0.003 (6.81)	0.006 (2.97)	0.003 (3.73)	-0.011 (-3.43)	-0.016 (-6.37)	-0.013 (-3.58)
8	-0.026 (-5.35)	0.002 (4.06)	-0.007 (-2.81)	0.002 (4.63)	-0.003 (-2.32)	0.003 (5.66)
9	-0.026 (-6.10)	-0.009 (-2.65)	-0.012 (-3.09)	0.015 (3.77)	0.021 (8.28)	0.019 (3.87)
10	-0.033 (-6.74)	-0.029 (-2.90)	-0.020 (-3.27)	0.029 (3.48)	0.071 (6.78)	0.024 (3.59)

Key: Z values are in the parentheses.

prior research that has shown that poor health contributes to greater vulnerability in the labor marketing [38], and that such vulnerability contributes to lower levels of job satisfaction [15, 21, 22]. Similar observations were made in relation to some aspects of socio-economic disadvantage, particularly in relation to household income and rural location, which is not surprising given both of these factors are regularly shown to contribute to higher health risks [39]. There were also some indications that the employment-related attributes were also influential in relation to job satisfaction, with supervisory responsibilities, and the number of hours, jobs and work locations all observed to reduce job satisfaction across multiple domains. Again, these factors are also regularly identified as significant contributors to increased stress, strain, and diminished health outcomes [21].

Future study might improve on our findings by gathering primary data that could be used to develop a more sophisticated conceptualization and measurement of the satisfaction variables. For example, future research could manipulate satisfaction experimentally or move beyond self-reported measures of disability. Likewise, future research could also expand the focus to consider how the findings of the present study are impacted by work patterns (e.g., part-time), disability type, and explicitly explore differences across populations of people with and without disability. Future studies could also examine additional domains of job satisfaction and a broader range of potential confounders within different

operational settings characterized by different policy and structural constraints and examine these issues using methods that would allow for greater causal inference.

Notwithstanding these limitations and the associated opportunities for future research, the present study has enhanced our understanding of how job satisfaction for PWD is influenced by a range of factors. The present work also provides important new insights that add to theory and will help inform policy interventions.

**Declarations**

*Author contribution statement*

Byron W. Keating: Conceived and designed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Syed Afroz Keramat: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.

Iain Waller: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.

Rubayyat Hashmi: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper.



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### Data availability statement

Data associated with this study has been deposited at <https://melbourneinstitute.unimelb.edu.au/hilda>.

### Declaration of interests statement

The authors declare no conflict of interest.

### Additional information

No additional information is available for this paper.

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