



Status inconsistency and mental health: A random effects and instrumental variables analysis using 14 annual waves of cohort data



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ABSTRACT

Status inconsistency refers to a discrepancy between the position a person holds in one domain of their social environment comparative to their position in another domain. For example, the experience of being overeducated for a job, or not using your skills in your job. We sought to assess the relationship between status inconsistency and mental health using 14 annual waves of cohort data. We used two approaches to measuring status inconsistency: 1) being overeducated for your job (objective measure); and 2) not using your skills in your job (subjective measure). We implemented a number of methodological approaches to assess the robustness of our findings, including instrumental variable, random effects, and fixed effects analysis. Mental health was assessed using the Mental Health Inventory-5. The random effects analysis indicates that only the subjective measure of status inconsistency was associated with a slight decrease in mental health ($\beta = -1.57$, 95% CI -1.78 to -1.36 , $p < 0.001$). This size of these coefficients was maintained in the instrumental variable analysis. We suggest that status inconsistency might explain some of the relationship between social determinants (such as work and education) and health outcomes.

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1. Introduction

In social epidemiology, both educational attainment and occupation are commonly used as markers of social class or position in society (Christensen et al., 2014; Geyer et al., 2006). As such, both measures have been used to examine the social gradient in health and mortality (Adler et al., 2000; Piha et al., 2010). These studies have shown that, generally speaking, the lower a person is on the social hierarchy, the greater their risk of poor health and mortality (Mackenbach et al., 2015). There is increasing biological evidence demonstrating the links between socio-economic status-related stress processes and health through the areas of the brain that support social and emotional information processing, and those that regulate neuroendocrine, immune, autonomic nervous system functions (McEwen and Gianaros, 2010). There is also likely to be

psychosocial pathways linking occupation and education to health outcomes, including though a sense of esteem, a feeling that activities are challenging and meaningful, and development of skills and abilities (Matthews and Gallo, 2011).

The concept of status inconsistency refers to a discrepancy between the position a person holds in one domain of their social environment comparative to their position in another domain (Stehr, 1968), such as the mismatch between higher educational attainment and employment in a lower skilled job. Generally, an individual could expect that a greater investment in education will result in a higher “pay off” in terms of being employed in a job that provides a stimulating environment, and higher social status and income (Gal et al., 2008). However, this might not always be possible due to a number of wider labour market factors (e.g., too many similarly qualified people competing for the same job) and personal-specific reasons (e.g., illness, disability). The inability to obtain employment in an occupation commensurate with a person's education level – hereafter referred to as status inconsistency – may result in a sense of frustration, resulting in poorer mental (Gal et al., 2008) and self-rated health (Smith and Frank, 2005), and

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higher risk of stroke (Honjo et al., 2014) and heart disease (Peter et al., 2007).

Status inconsistency has been measured in a number of ways (House and Harkins, 1975). Recent contributions to public health (Gal et al., 2008; Smith and Frank, 2005; Honjo et al., 2014; Peter et al., 2007) have measured this as a mismatch between a person's education and their income or occupation. These have shown the status inconsistency is associated with higher depression and anxiety (Gal et al., 2008; Reid, 2012), ischaemic heart disease (Peter et al., 2007), and stroke (Honjo et al., 2014). However, it should be noted that previous studies on mental health used cross-sectional designs (Gal et al., 2008) or didn't take advantage of the longitudinal nature of the data (Reid, 2012); hence, previous studies of status inconsistency and mental health have low causal inference due to potential bias.

Another way of assessing status inconsistency has relied on an individual's reported use of skills and abilities (Jones et al., 2011; Quintini, 2011; Zhu, 2015). There have been two studies that have explicitly assessed the relationship between overskilling and mental wellbeing (Zhu, 2015; Allen and van der Velden, 2001). Both of these studies suggest that a lack of skill use was associated with poor mental health. However, these studies did not account for the possibility of dependent misclassification, whereby exposure misclassification is not independent of the outcome, (e.g., a person with poorer mental health inaccurately reports a higher level of status inconsistency) or reverse causality, where an individual who is suffering a period of poorer mental health is temporally assigned more basic tasks than normal.

Using 14 annual waves of cohort data, the present paper will improve on the methodological robustness of past research and answer the question of whether status inconsistency is associated with mental health using instrumental variable analysis methods, which will remove potential sources of bias such as dependent misclassification and reverse causation.

2. Method

2.1. Data source

The Household, Income and Labour Dynamics in Australia (HILDA) Survey is a longitudinal study of Australian households established in 2001. It collects detailed information annually from over 13,000 individuals within over 7000 households (Wilkins, 2013). The response rate to wave 1 was 66% (Wilkins, 2013). Interviews were conducted with all persons in sample households aged 15 years or older. Additional persons have been added as a result of changes in household composition. For example, household members leaving their original household (e.g. children leaving home or couples separating) formed an entirely new household with all persons then living with the original sample member. Inclusion of these new households is the main way in which the HILDA survey maintains sample representativeness. The response rates for the HILDA survey are above 90% for respondents who have continued in the survey and above 70% for new respondents entering the study (Wilkins, 2013). This is a similar response rate to comparable national longitudinal household panel surveys (Schoeni et al., 2013). A top-up sample of 2000 people was added to the cohort in 2011 to allow better representation of the Australian population using the same methodology as the original sample (Watson, 2011).

The survey covers a range of dimensions including social, demographic, health, and economic conditions combining face-to-face interviews with trained interviewers and a self-completion questionnaire. The main variables examined in this study were available in waves from 2002 to 2014. All waves of HILDA are

included in this study. Only employed people were included in the study.

2.2. Outcome variable

Mental health was assessed using the five-item Mental Health Inventory (MHI-5), a subscale from the Short Form-36 (SF-36) general health measure. The MHI-5 assesses symptoms of depression and anxiety (nervousness, depressed affect) and positive aspects of mental health (feeling calm, happy) in the past 4 weeks. The MHI-5 has reasonable validity and is an effective screening instrument for mood disorders or severe depressive symptomatology in the general population (Rumpf et al., 2001; Yamazaki et al., 2005; Gill et al., 2006), and it has also been validated as a measure for depression against clinical interviews (Rumpf et al., 2001; Berwick et al., 1991; Cuijpers et al., 2009). The current analyses use the continuous MHI-5 score (scale 0 to 100), with higher scores representing better mental health. Generally speaking, a difference of three points on the norm based scale T-score has been suggested to reflect a minimally important difference (Ware, 2000).

2.3. Exposure variable

We explored the two common approaches to measuring status inconsistency, which represent both an objective and subjective approach (Quintini, 2011). First, we measured status inconsistency using a matrix of a person's highest level of educational attainment in relation to the occupation in which that person was currently employed (i.e., the objective approach). Occupation was measured using the Australian and New Zealand Standard Classification of Occupations (ANZSCO) at the two digit level (ABS, 2013), representing 43 occupational codes. Education was measured in seven levels (less than high school, high school, certificate, diploma, tertiary education (bachelor's degree), graduate diploma/certificate, and postgraduate tertiary education) treated as a continuous variable from 1 to 7. Those persons who had a higher educational level than the median for all persons employed in that ANZSCO occupation were classified as being of high status inconsistency, while those that had an education level at the median or below for that occupational group were classified as being low status inconsistency. As noted in the analysis section below, we conducted sensitivity analyses altering the cut point for education so as to provide alternate measures of high versus low inconsistency.

The second approach (subjective) used the single item "I use many of my skills and abilities in my current job", which was scaled from 1 (strongly disagree) to 7 (strongly agree). This item has been used to provide a measure of skill underutilisation in previous studies (Jones et al., 2011; Zhu, 2015). This variable was transformed into a binary variable as it was strongly positive skewed (with the majority of people reporting they did use many of their skills and abilities). Those persons that reported 6 or 7 on the scale were reported as having a high use of skills and scored as 0 (the reference category), while those that reported a lower use of skills (1–5) were recoded to score 1 as an indication of over qualification for the current job. We conducted a sensitivity analysis using the continuous variable (see below).

2.4. Confounders

The other covariates represented those that could be considered as possible confounders (i.e., prior common causes) of the relationship between status inconsistency and mental health. These included fathers' and mothers' occupation (coded using the ANZSCO codes), gender, age, household structure (couple with no children, couple with children, lone parent with children, lone

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