University Library

MINERVA ACCESS

A gateway to Melbourne's research publications

Minerva Access is the Institutional Repository of The University of Melbourne

Author/s:
Mooi-Reci, I;Wooden, M

Title:
Jobless parents, unhealthy children? How past exposure to parental joblessness influences children's future health

Date:
2022-09-01

Citation:
Mooi-Reci, I. & Wooden, M. (2022). Jobless parents, unhealthy children? How past exposure to parental joblessness influences children's future health. Ssm Population Health, 19, https://doi.org/10.1016/j.ssmph.2022.101144.

Persistent Link:
https://hdl.handle.net/11343/316497

License:
CC BY-NC-ND

SSM - Population Health 19 (2022) 101144



Contents lists available at ScienceDirect

SSM - Population Health

journal homepage: www.elsevier.com/locate/ssmph



Jobless parents, unhealthy children? How past exposure to parental joblessness influences children's future health

Irma Mooi-Reci [a,b,c,*], Mark Wooden [c]

[a] School of Social and Political Sciences, University of Melbourne, Grattan Street, Melbourne, VIC, 3000, Australia
[b] Melbourne Institute of Applied Economic and Social Research, University of Melbourne, Australia
[c] Australian Research Council Centre of Excellence, Families and Children over the Lifecourse, Melbourne Node, University of Melbourne, FBE Building, Melbourne, VIC, 3000, Australia

A B S T R A C T

Rationale: Despite a growing body of work investigating the combined effects of maternal and paternal joblessness for children's outcomes, very little is known about the long-term effects of parental joblessness on children's health, and especially health during adulthood.
Objective: The primary objective of this study is to directly test whether exposure to parental joblessness during childhood and early adulthood has adverse consequences for health in later years. This study also explores whether family resources, time inputs and family harmony mediate this relationship.
Methods: Multilevel generalized structural equation models describing processes influencing child health outcomes in later life are estimated using longitudinal data from 19 waves of the Household, Income and Labour Dynamics in Australia Survey ($N = 2875$ individuals and 22,942 person-year observations).
Results: Parental joblessness, especially when experienced over a protracted period, is found to impose a penalty on children's mental health in later life, which is mostly not mediated by other variables. A significant negative association with general health is also found, but in this case family income and family harmony play a more important mediating role.
Conclusion: The results suggest that it is not parental job loss per se that matters, but parents not being able to quickly find alternative employment. It is only children in families where joblessness is protracted and long-lasting who are at serious risk of long-term health problems. In sum, our results imply that the parental outcome that is most important for children's later health, and especially their mental health, is continuous paid employment. Such findings provide support for a jobs-first policy emphasis.

1. Introduction

A growing number of studies have documented the harmful effects of parental joblessness (and especially paternal job loss) on children's health outcomes measured at birth or in childhood (e.g., Lindo, 2011; Liu & Zhao, 2014; Mörk et al., 2014; Pieters & Rawlings, 2020; Schaller & Zerpa, 2019). Such findings are highly significant given the widespread evidence demonstrating the importance of childhood health for socio-economic status in adulthood (Almond et al., 2018; Currie, 2009). Only rarely, however, has any study investigated whether the consequences of parental joblessness for children's health are long lasting, and where long-run effects were estimated, as in Mörk et al. (2014), the focus was still on impacts during childhood or adolescence. This lack of research is surprising given health outcomes, and especially mental health outcomes, "are rarely the immediate consequence of exposure to risk" (Strohschein, 2005, p. 359). Furthermore, little consideration has been given to the possibility that effects might differ depending on whether both parents are jobless.

Also lacking is systematic empirical evidence on the mechanisms linking parental joblessness and children's health, let alone identifying which channels are most important for long-run health outcomes. Based on theories about family investment in health (e.g., Currie, 2009; Jacobson, 2000) and family stress (e.g., Conger et al., 1990), adverse economic conditions attached to parental joblessness are expected to be linked indirectly to children's health outcomes through reductions in family's resources, changes in parental time, and increased family stress (Kalil et al., 2014; Leininger & Kalil, 2014). Parental joblessness can also change the quality of within-household relationships and hence family harmony, which in turn may influence children's future health outcomes.

Our study addresses these research gaps by using longitudinal survey data spanning a 19-year period to investigate whether past exposure to

Abbreviations: PJ, parental joblessness and displacement; CMH, child mental health; CGH, child general health; AUS, Australia; HILDA, HILDA survey; IGD, Intergenerational disadvantage.

* Corresponding author. Level 5, John Medley Building (E570), Grattan Street, University of Melbourne, VIC, 3010, Australia.
E-mail addresses: irma.mooi@unimelb.edu.au (I. Mooi-Reci), m.wooden@unimelb.edu.au (M. Wooden).

https://doi.org/10.1016/j.ssmph.2022.101144
Received 3 April 2022; Received in revised form 7 June 2022; Accepted 8 June 2022
Available online 13 June 2022
2352-8273/© 2022 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

parental joblessness (measured by the proportion of time a child was living in a household where no parent was employed) is associated with children's mental and general health during early adulthood. It also examines the various channels (i.e., family resources, time inputs, and family harmony) through which parental joblessness effects are transmitted to children's health. We fit a multilevel structural equation model that accounts for common time-invariant and unobserved factors at the household level that could bias our analyses.

A feature of our analysis is defining parental joblessness based on the simultaneous employment status of both parents. We argue that this approach is more appropriate in an era where dual-earner households are more the norm. Indeed, it is our contention that the consequences of parental joblessness will be most severe when all relevant parent figures are without jobs.

2. Parental joblessness and children's health: what are the mechanisms?

For many children, long-term exposure to parental joblessness in childhood or adolescence can be a disruptive and adverse experience that carries implications for their future health. Numerous studies in the social and medical sciences have shown that adverse childhood or adolescence experiences are strongly correlated with poor physiological and mental health in adulthood (see Hughes et al., 2017). Bio-molecular studies explaining how this comes about indicate that initial stress triggered by childhood adversity influences the nervous and immune systems and reduces cognitive, social, and emotional functioning, ultimately leading to poorer health. They also show that initial stress gets "biologically programmed" into the body's system and proliferates with long-term exposure to adversity. This gives rise to heightened mental reactivity to stress (Miller et al., 2011) and leads to the adoption and persistence of unhealthy lifestyle behaviours, which ultimately contribute directly to poor health (e.g., Anda et al., 2006). Given these arguments and evidence, we expect greater exposure to parental joblessness to be directly and negatively associated with poor mental and general health in adulthood (H1).

Parental joblessness effects may also influence children's health indirectly through changes in family income, parental time input, and interpersonal relationship satisfaction (Francesconi & Heckman, 2016). The process underlying parents' employment adversity and children's outcomes is complex and has been extensively conceptualized within resource-based theories (Becker & Tomes, 1986; Blau & Duncan, 1967) and family stress models (Conger et al., 2010). Originating from a resources-based perspective, the child health production model (Jacobson, 2000), which in turn is based on the pioneering work of Grossman (1972), has been used to explain the relationship between (reductions in) family's material resources and children's health outcomes. The model posits that parents attempt to achieve the best possible health outcomes for their children by investing in goods, activities and services that promote children's future health. Within this framework, parental joblessness could influence children's health outcomes by reducing access to resources that help households avoid health risk factors, such as purchasing nutritious food (Pechey & Monsivais, 2016), investing in proper healthcare (Schaller & Zerpa, 2019), or providing children with access to regular preventive medical check-ups and screenings (Fairbrother et al., 2010). Further, the reduction in household incomes associated with parental joblessness may force parents to shift towards cheaper, more energy-dense but low-nutrient foods, which have been found to increase the risk of child obesity and other health related problems (Anderson et al., 2009; Jo, 2014; Matthews & Gallo, 2011). Based on these findings, we expect that greater exposure to parental joblessness will influence children's long-term health outcomes through reduced family resources (H2).

According to the child health production model, parental joblessness can also change parents' available time with children, which in turn could influence children's health. Certainly, the evidence from time use survey data confirms that non-working mothers spend more time with their children than working mothers (e.g., Cawley & Liu, 2012; Sandberg & Hofferth, 2001). Greater availability of parental time could also reduce exposure to children's illnesses or potential injuries related to attending day care (since children spend less time in day care) or pre/after school activities, which in turn could contribute to better health. In contrast, joblessness often puts parents under enormous strain and distress, which may lead to reductions in the quality (and quantity) of parenting time inputs and so potentially contribute to poorer health outcomes (especially mental health) for their children. We thus expect that changes in parental time allocation associated with parental joblessness will lead to changes in child health (H3), though it is unclear in which direction.

Finally, parental joblessness can also affect within-household relationship satisfaction, or what we call family harmony, which in turn can also lead to changes in children's health. The mediating role of family harmony in the context of economic hardship is best conceptualized within the family "stress" model (FSM) (Conger et al., 2010; Masarik & Conger, 2017). In this model, adverse economic conditions produce parental worries and strains that can be manifested in increased marital conflict and disharmony, disengaged parenting behaviour, reduced emotional warmth, and strained parent-child relationships (Masarik & Conger, 2017). In this context, parental stress caused by parental joblessness could strain within-household relationships or deepen ongoing relationship dissatisfactions in the family, increasing the risk that children themselves feel stressed and overburdened. This would result in children becoming more susceptible to disease development, including depression and anxiety, than those not exposed. Based on these arguments, we expect that parental joblessness will influence children's health through changes in family harmony (manifested in reduced levels of interpersonal relationship satisfaction) (H4). Further, we expect that some of this adverse effect of parental joblessness on family harmony will be mediated by family resources (H5). That is, some of the adverse consequences of joblessness on family harmony will be a result of reduced financial resources and the associated financial strain.

3. Data, measures and methods

3.1. Data and sample

We use 19 waves of data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey, an annually conducted longitudinal survey that began in 2001 with a nationally representative sample of households (Watson & Wooden, 2012). The initial respondent sample comprised members of 7682 participating households (achieved from a selected sample of 11,693 households identified as in-scope). Each year interviews are sought with all adult members (persons aged 15 years or older on the 30th of June preceding the interview date) of these households as well as any other adults living with these original sample members. In addition, all respondents are asked to complete a separate self-completion questionnaire (SCQ), which is the source of our heath outcome measures. Annual re-interview rates are high, rising from 87% in wave 2–96% by wave 9 and remaining above that level in subsequent waves (Summerfield et al., 2020). There is, however, additional non-response associated with the SCQ: Within the original sample, the SCQ return rate averaged just over 90% over the first 19 waves.

For our analysis we began by selecting a subsample of respondents born between 1984 and 1996 who reported valid information about their mental and general health in at least one of the years 2008–2019. This provided 27,717 person-year observations from 3792 individuals. Of these, 802 respondents were dropped due to missingness on parental employment calendar histories, another 71 were dropped due to incomplete information on co-residence with parents during the first seven waves, and 44 respondents were dropped due to missingness on one or more analytical variables. Our analytical sample thus comprised 2875 persons (i.e., children) from 1719 households and provided 22,942

person-year observations. A more detailed summary of the sample selection process is provided in Fig. S1 of the Supplementary Appendix. The cumulative exposure to parental joblessness ranged between roughly 10 days and 90 months, with an average exposure of 28 months across individuals who co-resided with jobless parents between 2001 and 2007.

3.2. Measures

Health outcomes. Respondent's mental and general health are observed in waves 8 through 19 (i.e., 2008 to 2019). Both variables were constructed from respondent reports to items that comprise two subscales of the Short Form (SF-36) Health Survey (Ware et al., 2000): (i) the five-item Mental Health Inventory (MHI-5), which assesses the frequency of symptoms of anxiety and mood disturbance over the 4-week period preceding the interview; and (ii) the General Health (GH) sub-scale, which also consists of five items, and assesses respondents' general health and wellbeing, again over the 4-week period preceding the interview. In both cases, raw scores on each individual item were summed and scale values transformed to range from 0 to 100, with relatively low scores indicative of a poor health state.

Parental joblessness. The effects of parental joblessness are measured by the proportion of time that respondents were exposed to parental joblessness during the first seven waves of the HILDA Survey (i.e., 2001–2007) when children were between the ages 5 to 17 in 2001 and 11 to 23 in 2007. It is a time-constant variable that ranges from 0 (not exposed) to 1 (exposed over the entire period between 2001 and 2007) and is derived from a count of the number of days when the co-residing parent(s) were jointly jobless divided by the total time for which parents' employment status was observed over the period 2001–2007 (but restricted to periods when children were observed co-residing with at least one parent).

In defining parent-child relationships, we use co-residence and not biological status, meaning that step-parents will be defined as parents. Information about joblessness comes from a calendar where respondents report their labour force status for three periods of roughly ten days per month over the period between 1 July in the previous year and the date of interview, a period of anywhere between 12- and 20-months duration (but with 13–15 months being typical). We code each period as beginning on the 1st, 11th, and 21st of the month. For the majority of our sample (82%), the cumulative labor force information obtained from the co-residing parent(s) during the first seven waves ranged between 60 and 90 months. In couple households, we trace the period when the mother and the father reported they were either unemployed or out of the labour force at the same time, which we combine into a single "jobless" state. Critically, for couple households (either partnered or married) to be defined as jobless, both parents had to be jobless at the same time. In single-parent households or in households where children transitioned from two-parent to single-parent households, we trace the period of the co-residing parent.

Family resources. The level of a family's financial resource is represented by the average of the log of annual (i.e., financial year) real equivalized disposable household income measured over period July 1, 2000 to June 30, 2007. Household income is constructed by summing the personal incomes of all household members, which in turn is constructed by summing the different components of individual income. Missing values for any income components are imputed (for details, see Summerfield et al., 2020).

Parental time with children. The amount of time parents spent with their children is constructed from responses to the following question (again included in the SCQ) asked directly of mothers and fathers: "How much time would you spend in a typical week playing with your children, helping them with personal care, teaching coaching or actively supervising them, or getting them to child care, school and other activities?" We created separate time-constant variables for mothers and fathers using the average values observed over the first seven survey waves.

Note that the variables for time with children (as well as those for relationship satisfaction discussed below), are affected by missingness due to the non-return of some SCQs. To deal with this, missing values on these variables were imputed using the mean response for all remaining observed cases over the period 2001–2007, and separate indicator variables identifying the missing cases included as additional controls in our regression analyses.

Family harmony. Family harmony is represented by measures of father's and mother's interpersonal relationship satisfaction, which in turn are based on three survey items that were asked of mothers and fathers, respectively: "How satisfied are you with the relationship with: (i) your partner; (ii) your children; and (iii) your partner's relationship with your children." In each case, an 11-point scale was used, with values ranging from 0, "completely dissatisfied", to 10, "completely satisfied". The three items displayed considerable internal consistency suggesting they can be combined into two summary measures; one for fathers (Cronbach's alpha = 0.79) and one for mothers (Cronbach's alpha = 0.76). Both measures are time-constant averages of values observed during the first seven waves.

Control variables. We included a range of control variables: gender; whether born in Australia; whether an Aboriginal or Torres Strait Islander; marital status; the presence of children; highest level of educational attainment; employment status at time of interview; and birth cohort dummies.

Pre-existing health-related issues among parents and children can influence both the incidence of parental joblessness and children's long-term health. We thus controlled for the presence of long-term health conditions, disability or impairments among parents and children using a question in the household questionnaire, which was asked of one household member: "Does anyone here have any long-term health condition, disability or impairment?" Based on the responses to this question in the survey wave when first asked, two dummy variables were constructed: one identifying whether at least one of the parents had a long-term health condition, disability, or impairment, and the other whether the respondent had a long-term health condition, disability, or impairment.

We also controlled for three household background characteristics measured when children co-resided with their parents. These were: the remoteness of the location where the respondent was living when first observed co-residing with their parents; whether the respondent had any siblings; and whether the respondent lived in an intact family (defined as living with both biological parents) at age 14. Finally, we included dummies for survey year, with 2008 serving as the reference year. Descriptive statistics for all variables are provided in Table 1.

3.3. Estimation strategy

We estimate a multilevel generalized structural equation model (GSEM) (as described in Skrondal & Rabe-Hesketh, 2004) that takes the following form:

$$H_{ijt}^{C} = \alpha_0 + \alpha_1 JP_{ij}^{P} + \alpha_2 \boldsymbol{x}_{ijt} + \alpha_3 M_{ij} + \varepsilon_i \quad (1)$$

and

$$M_{ij} = \gamma_0 + \gamma_1 JP_{ij}^{P} + \gamma_2 \boldsymbol{x}_{ijt} + e_i \quad (2)$$

where H_{ijt}^{C} refers to either mental or general health of child i observed in household j in wave t (i.e., 2008–2019), JP_{ij}^{P} refers to the cumulative proportion of parental joblessness over the period 2001–2007, and $\boldsymbol{x}_i$ is a vector of family background and socio-demographic characteristics. In equation (2), M_{ij} refers to the mediating mechanisms (i.e., family resources, parental time, and family harmony, averaged over the period 2001–2007), which are a function of both parental joblessness (JP_{ij}^{P}) and a vector of individual and family background characteristics ($\boldsymbol{x}_i$), with ε_i

Table 1
Descriptive statistics (pooled person-year sample, HILDA Survey, 2001–2019).

Variables	Mean	SD
Respondent characteristics		
Mental health (0–100)	72.224	17.186
General health (0–100)	72.337	18.826
Male	0.468	0.499
Australian born	0.946	0.225
Aboriginal or Torres Strait Islander	0.038	0.192
Highest education level		
Less than high school	0.267	0.442
High school	0.351	0.477
Diploma/Certificate level III or IV	0.202	0.401
Bachelor's degree or higher	0.179	0.383
Birth cohort		
1984–1987	0.267	0.442
1988–1991	0.252	0.434
1991–1996	0.479	0.499
Jobless at time of interview	0.148	0.355
Has dependent children	0.156	0.364
Marital status		
Married or in a de-facto relationship	0.307	0.461
Single	0.683	0.465
Separated/divorced or widowed	0.009	0.095
Long-term health condition, disability, or impairment	0.090	0.286
Parental/Household-background characteristics		
Proportion of parental joblessness	0.117	0.270
Average log of real annual equivalized disposable household income[a]	9.944	0.547
Average interpersonal relationship satisfaction, father (0–10)	8.235	1.263
Average interpersonal relationship satisfaction, mother (0–10)	7.854	1.507
Average time with children, father (hours per week)	8.199	6.239
Average time with children, mother (hours per week)	14.727	11.938
Intact family at age 14	0.701	0.457
Remoteness when first observed living with parents:		
Major city	0.597	0.490
Inner regional	0.262	0.439
Outer regional or Remote	0.141	0.347
≥ 1 parent with long-term health condition, disability, or impairment	0.204	0.403
≥ 1 sibling	0.954	0.207

[a] The equivalence scale used is the OECD modified scale, which assigns a weight of 1.0 for the first adult in the household, 0.5 for every other adult, and 0.3 for every child.

and e_i representing idiosyncratic error terms. To obtain the total and the mediating effects we substitute equation (2) into equation (1), which gives:

$$H_{ijt}^{C} = \alpha_0 + \alpha_1 JP_{ij}^{P} + \alpha_2 \boldsymbol{x}_{ijt} + \alpha_3 \left(\gamma_0 + \gamma_1 JP_{ij}^{P} + e_{ij}\right) + \varepsilon_i$$

$$\left(\alpha_0 + \alpha_3\gamma_0\right) + (\alpha_1 + \alpha_3\gamma_1) JP_{ij}^{P} + \left(\alpha_2 + \alpha_3\gamma_2\right)\boldsymbol{x}_{ijt} + \left(\varepsilon_i + \alpha_3 e_i\right) \quad (3)$$

In equation (3) the direct effect of parental joblessness is equal to α_1, while the mediating effect of parental joblessness through the mediating mechanisms (M_{ij}) is equal to $\alpha_3\gamma_1$. The total effect of parental joblessness on children's health is equal to the direct effect plus the product of the indirect effects $(\alpha_1 + \alpha_3\gamma_1)$, all else equal.

4. Results

4.1. Descriptive results

Table 1 reports the means and standard deviations of the selected variables. Our sample members score, on average, 72.2 points on the mental health index and 72.3 points on the general health index, which is extremely close to the population weighted averages for Australians of a similar age. By construction, sample members are relatively young, being born sometime between 1984 and 1996 (and thus aged anywhere between 15 and 35 years old during the observation period 2008 to 2019). Not surprisingly, therefore, the majority were also single (68%). The age composition of our sample also helps explain why the majority (95%) were born in Australia (but just over 32% of our sample had at least one parent who was born overseas). Males were slightly under-represented (47%), which reflects gender differences in response. Close to 15% were jobless at the time of the interview (again observed over the period 2008 to 2019). Most importantly, the average proportion of time when the (co)residing parent(s) of the respondent were jointly jobless over the period 2001–2007 was 11.7%.

4.2. Mental health

In Table 2, we report selected GSEM estimates for respondent's mental health, first as a function of their exposure to parental joblessness (Column 1) and then as a function of parental joblessness, the mediating mechanisms, and a range of individual and family background characteristics (Column 2). Consistent with Hypothesis 1, results in Column 1 indicate a strong and sizeable negative association between long-term exposure to parental joblessness and children's mental health in early adulthood ($b = -6.130$; $p < 0.001$). Thus, conditional on being selected into the sample, children exposed continuously to parental joblessness over the period 2001 to 2007 experience, on average, 6.130 points lower mental health in adulthood than those never exposed to parental joblessness. But will this relationship hold once we control for the mediating mechanisms and other relevant covariates?

In Column 2 of Table 2, we test the set of hypotheses about the direct and indirect mechanisms through which parental joblessness influences children's mental health in early adulthood while controlling for a range of individual and family background characteristics. Prior research and theory led us to expect a direct relationship between parental joblessness and children's mental health (Hypothesis 1), which is strongly supported in Column 2. Specifically, we find evidence that long-term

Table 2
Estimated effects of past parental joblessness on mental health in adulthood, HILDA Survey 2001–2019 (selected unstandardized coefficients from multilevel structural equation models)[a].

	Baseline model (1)	+ Mediators & controls (2)
Parental joblessness proportion, 2001–2007	−6.130**	−3.507**
	(0.975)	(1.262)
Family resources		
Average log of real equivalized disposable household income		0.447
		(0.609)
Family harmony		
Average interpersonal relationship satisfaction, father		1.028***
		(0.234)
Average interpersonal relationship satisfaction, mother		0.739***
		(0.185)
Parental time with children		
Average time with children, father		−0.007
		(0.044)
Average time with children, mother		0.025
		(0.023)
N households	1719	1719
N respondents	2875	2875
N person-year observations	22,942	22,942
Variance (individual)	109.418**	101.767***
	(5.668)	(5.153)
Variance (household)	36.973**	28.188***
	(5.359)	(4.639)

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$ (two-tailed test).
[b]Full GSEM estimates are shown in Table S1 of the Supplementary Online Appendix.
[a] Robust standard errors (clustered at the household level) are reported in parentheses.

exposure to parental joblessness is directly associated with sizeable reductions in children's average mental health in adulthood ($b = -3.507$; $p < 0.01$), all else equal.

Theories about parental investments and prior research on parental time use also led us to expect that monetary resources in the form of household incomes (Hypothesis 2) and non-monetary resources in the form of parental time with children (Hypothesis 3) would lead to improvements in children's mental health. However, we find no support for these hypotheses in the context of adult mental health. Results in Column 2, however, do show a positive association between both father's ($b = 1.028$; $p < 0.001$) and mother's ($b = 0.739$; $p < 0.001$) relationship satisfaction and children's mental health in adulthood. These effects suggest that, in line with family stress theories, family harmony also exerts an independent influence on children's mental health in later life. That said, the magnitude of these effects is not large.

In Fig. 1, and for the purpose of exposition, we illustrate the channels through which parental joblessness influences children's mental health in early adulthood. This allows us to test Hypothesis 5: Parental joblessness influences children's health through family resources and family harmony. Fig. 1 draws on the full GSEM estimates (reported in Table S1 of the Supplementary Appendix). Indirect effects, which reflect the involved channels, are calculated by multiplying, for example, the coefficient of parental joblessness on the household income variable ($b = 0.882$; $p < 0.001$) by the coefficient of the household income variable on mental health ($b = 0.447$; $p > 0.1$). The indirect effects for each of the hypothesized channels are then summed to obtain a total indirect effect.

Fig. 1 shows the sizeable direct pathway between parental joblessness and children's mental health noted above, which remains largely unexplained by the mediating variables and a range of controls. We find only one indirect pathway that is statistically significant, though still small in size. Specifically, we find an indirect negative relationship that runs through mother's relationship satisfaction ($b = -0.433$; $p < 0.05$) to children's mental health ($b = 0.739$; $p < 0.001$). The product of these indirect effects is -0.319 ($= -0.433 \times 0.739$), and significant at the 5% level, which suggests a 0.32-point reduction in the mental health index as an adult. But given a standard deviation on the mental health index of just over 17, this is clearly a very small effect.

The total effect, which sums both the direct and indirect effects, however, is sizeable ($b = -4.319$; $p < 0.001$), and considerably larger than the estimate from a comparable single-equation model (not reported). In terms of the relative contribution to the overall total effect, the results indicate that the combined indirect effects account for only 19% of the total effect, all else equal. Overall, these results suggest that both direct and indirect pathways contribute to a sizeable differential in adult mental health, but it is the direct effect attached to parental joblessness that accounts for the majority (81%) of this mental health gap.

4.3. General health

In Table 3, we repeat the generalized structural equation estimates for respondent's general health. We start with Column 1, which estimates the "gross" intergenerational association between parental joblessness and respondent's general health. Results show the same pattern as in Table 2, with a sizeable negative association between parental joblessness and adult general health ($b = -6.867$; $p < 0.001$). Thus, conditional on being selected into the sample, those exposed entirely to parental joblessness over the period 2001 to 2007 experience, on average, 6.867 points poorer general health in adulthood than those not exposed.

Column 2 includes the mediating mechanisms and adjusts for individual and family background characteristics. Results show a much reduced size in the unstandardized coefficient for parental joblessness ($b = -1.994$; $p > 0.05$) all else equal, which is no longer significant at the 5% level. These results lend no support for Hypothesis 1 that expected a direct relationship between parental joblessness and adult general health, suggesting that any effects attached to parental joblessness operate mainly through the mediating mechanisms. Results in Column 2

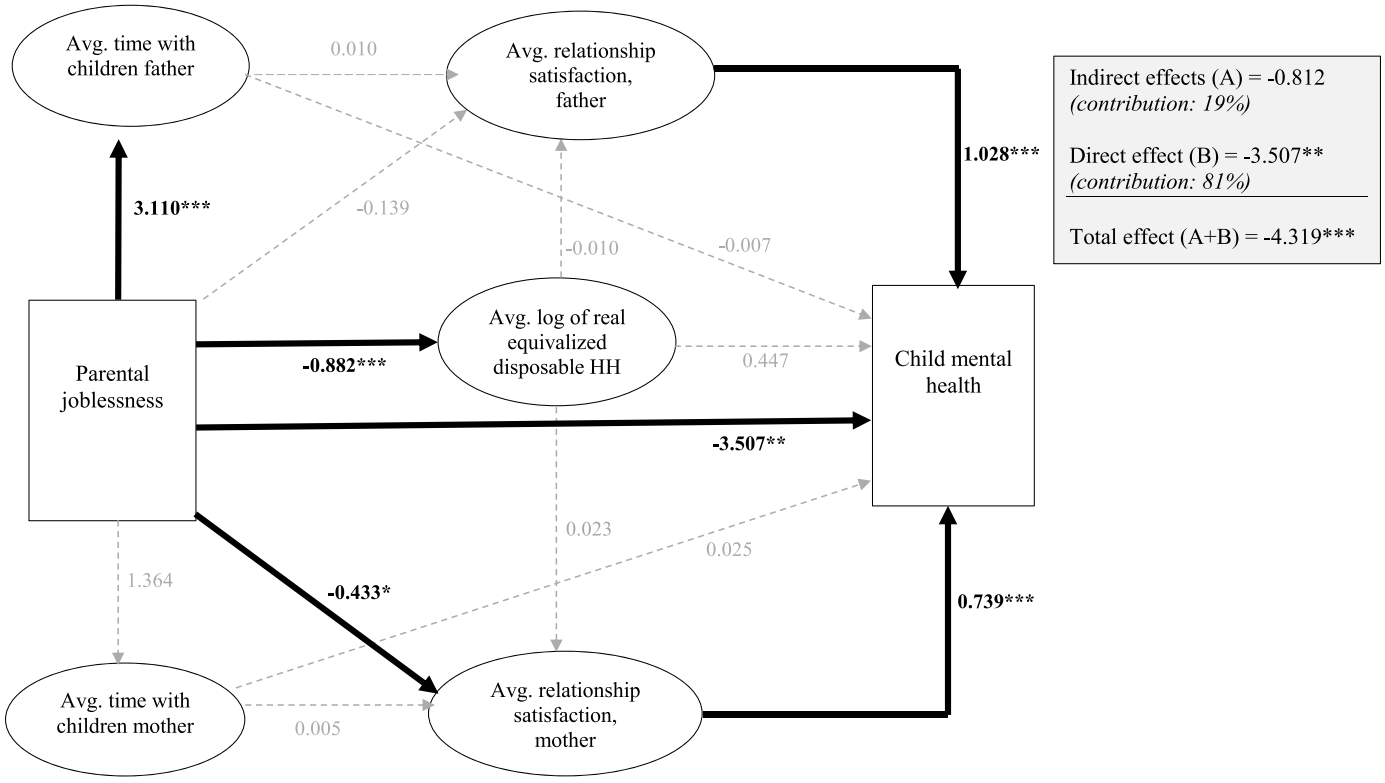


Fig. 1. Direct and indirect pathways between parental joblessness and Children's mental health – unstandardized estimates from multilevel structural equation models, *Including* control variables.

Table 3
Estimated effects of past parental joblessness on general health in adulthood, HILDA Survey 2001–2019 (selected unstandardized coefficients from multilevel structural equation models)[a].

	Baseline model (1)	+ Mediators & Controls (2)
Parental joblessness proportion, 2001–2007	−6.867***	−1.994
	(1.051)	(1.267)
Family resources		
Average log of real equivalized disposable household income		1.425*
		(0.630)
Family harmony		
Average interpersonal relationship satisfaction, father		0.831**
		(0.266)
Average interpersonal relationship satisfaction, mother		0.469*
		(0.224)
Parental time with children		
Average time with children, father		−0.053
		(0.054)
Average time with children, mother		0.041
		(0.028)
N households	1719	1719
N respondents	2875	2875
N person-year observations	22,942	22,942
Variance (individual)	166.200***	160.042***
	(8.190)	(7.838)
Variance (household)	45.131***	35.833***
	(7.060)	(6.604)

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$ (two-tailed test).
b Full GSEM estimates are shown in Table S2 of the Supplementary Online Appendix.
[a] Robust standard errors (clustered at the household level) are reported in parentheses.

show significant effects for household income ($b = 1.425$; $p < 0.05$), fathers' interpersonal relationship satisfaction ($b = 0.831$; $p < 0.01$), and mothers' interpersonal relationship satisfaction ($b = 0.469$; $p < 0.05$) on children's adult general health. These results provide evidence in support of the hypotheses that family resources (Hypothesis 2) and family harmony (Hypothesis 4) influence health in adulthood. We find no direct associations between mother's and father's time with children and children's general health, and thus no support for Hypothesis 3.

In Fig. 2, we unpack the direct and indirect effects attached to parental joblessness following the same approach as in Fig. 1. Consistent with Hypothesis 2, the most prominent indirect pathway from parental joblessness to children's adult general health runs through family resources. Specifically, we find an indirect negative relationship between parental joblessness and the household income ($b = -0.882$; $p < 0.01$) and a positive relationship between household income and children's general health ($b = 1.425$; $p < 0.05$). Combined, the product of these indirect effects leads to a reduction in adult general health by 1.257 points (-0.882×1.425), which is significant at the 1% level. The second indirect pathway runs through mother's relationship satisfaction ($b = -0.433$; $p < 0.05$) to ultimately influence children's adult general health ($b = 0.469$; $p < 0.05$). This indirect channel is associated with a 0.20 points reduction in the general health index (-0.433×0.469), which is both very small, and only weakly significant. This evidence thus provides only weak support for Hypothesis 5.

In Fig. 2, the sum of all indirect effects together is considerable ($b = -1.660$; $p < 0.05$), suggesting that indirect effects contribute to 44% of the total effects of parental joblessness on adult general health ($b = -3.654$; $p < 0.01$), all else equal. Overall, these results suggest that parental joblessness effects operate indirectly to reduce children's general health in adulthood and these indirect effects account for a large proportion of differentials in adult general health. Nevertheless, it is also worth noting that the estimated direct effect of parental joblessness on general health is still larger than the combined indirect effects. Unfortunately, this estimate is very imprecise and thus we cannot be confident

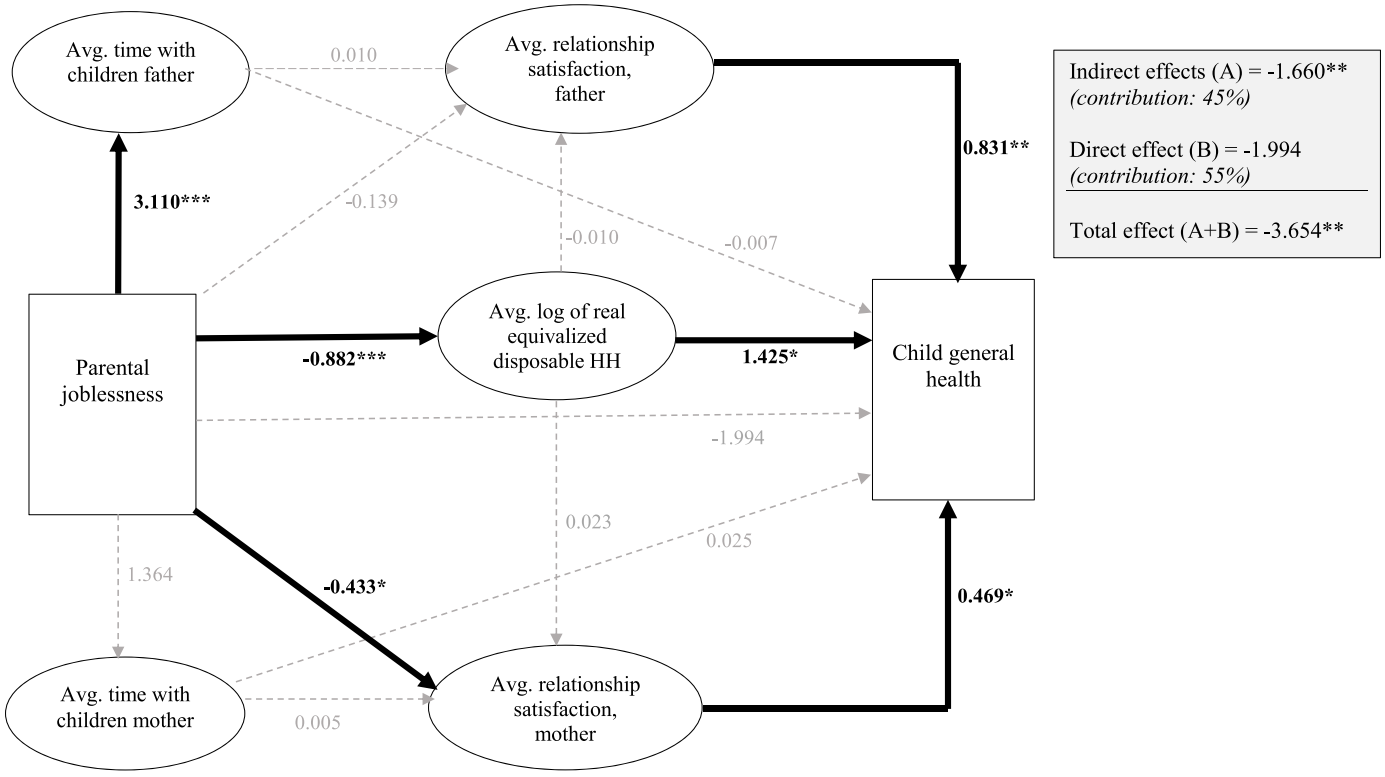


Fig. 2. Direct and indirect pathways between parental joblessness and children's general health – unstandardized estimates from multilevel structural equation models, *including* control variables.

that this effect is not simply duo to sampling error.

4.4. Specification and robustness checks

We undertook several simple checks for whether our results might be affected by bias due to non-random panel attrition and omitted variables.

To test whether (non-random) sample attrition that occurs during the panel biased our results, we adopted an approach proposed by Verbeek and Nijman (1992) and augmented our specification with a variable that identified whether the sample member was a non-respondent at the next survey wave. Results are presented in Columns 1a and 2a of Table 4 and can be compared to specifications of the extended model reported in Column 2 of Tables 2 and 3 Note, however, that this test requires withholding one wave of observations and hence the sample size is smaller (20,260 person-year observations compared to 22,942 person-year observations in Tables 2 and 3). As can be seen, the coefficient estimates for sample attrition were not statistically significant in either model ($b = -1.024$; $p > 0.1$ and $b = -1.852$; $p > 0.05$) and consequently the coefficient for parental joblessness changed little (compared to that presented earlier in Tables 2 and 3). These results suggest there is no reason to suspect bias in our estimates because of sample attrition.

It could also be argued that our estimates might be biased because omitted parental work motivations will both be correlated with parental joblessness and influence children's health. To test for this possibility, we excluded parents whose modal reason for joblessness was related to their own poor health during the first seven waves. This reduced our sample size somewhat (from 22,942 person-year observations to 21,972). The results are reported in Columns 1b and 2b and continue to support earlier findings. Indeed, if anything they provide stronger support, with the estimated direct effects of parental joblessness being larger in absolute terms. In the case of mental health, the estimated coefficient is −4.344 ($p < 0.001$), which compares with −3.506 in Table 2. Similarly, the relevant coefficient in the model for general health is −2.415 compared with −1.991 in Table 3. However, this latter coefficient estimate remains statistically insignificant.

We also tested whether health effects varied for alternative measures of parental joblessness. In Column (1) of Table 5, we report results on mental health where the main explanatory variable was based only on the joblessness of either the father or the mother. Results for general health, which continue to remain insignificant, are reported in Table S3 of the Supplementary Online Appendix. As shown in Column (1), the effects of these alternative joblessness measures are smaller than those for our preferred household joblessness measure reported in Table 2. Notably, and in line with previous research (e.g., Schaller & Zerpa, 2019), results indicate greater negative effects associated with paternal than maternal joblessness, which has been attributed to both greater material and social deprivation when the father is jobless. Finally, Columns (2) through (4) in Table 5 present results from extended models separately for three sub-samples distinguishing between those: (i) always observed living in single-parent households (Column 2); (ii) always observed living in dual-parent household (Column 3); and (iii) those living sometimes in a dual-parent household and sometimes in a single-parent household (Column 4). The results show that the negative impact of parental joblessness on children's mental health in later years is largest for those who grew up in single-parent households. However, the difference between single-parent and the parental joblessness measure (reported in Column 2 of Table 2) was not statistically significant. These results provide further support for our hypothesis that dual-parent joblessness has larger negative impacts on children's health than the joblessness of either parent on their own.

5. Discussion

In this study, 19 waves of longitudinal data from the HILDA Survey were used to investigate: (i) the long-term association between parental joblessness and children's mental and general health in adulthood; and (ii) the mechanisms underlying this relationship. We argued that understanding the long-term consequences of parental joblessness for children's health requires a focus on both direct and indirect pathways linking this process. We drew on resource-based theories (e.g., Becker & Tomes, 1986; Blau & Duncan, 1967), family stress models (e.g., Conger et al., 2010) and parental time use research (e.g., Cawley & Liu, 2012) to identify the links between parental joblessness and children's adult mental and general health.

Results from a series of multilevel structural equation models confirmed that, all else equal, children continuously exposed to parental joblessness were more vulnerable to poor mental and general health in later years. This finding lends support to the prediction, based on prior work from social and medical studies, that early adverse experiences proliferate stress and ultimately contribute to poor health (e.g., Hughes

Table 4
Sensitivity checks for attrition and omitted variables bias – unstandardized coefficient estimates (multilevel structural equation models)[a].

	Mental health		General health	
	+ Control for non-response (1a)	Excl. parents whose reason for joblessness was poor health (1b)	+ Control for non-response (2a)	Excl. parents whose reason for joblessness was poor health (2b)
Parental joblessness proportion, 2001–2007	−3.535**	−4.344***	−2.161	−2.415
	(1.319)	(1.231)	(1.314)	(1.287)
Non-respondent at $t+1$	−1.024		−1.852	
	(1.071)		(1.040)	
N households	1668	1659	1668	1659
N respondents	2783	2756	2783	2756
N person-year observations	20,260	21,892	20,260	21,892
Variance (individual)	100.631***	102.535***	198.915***	194.110***
	(5.245)	(5.337)	(6.348)	(6.267)
Variance (household)	30.495***	25.225***	116.837***	115.295***
	(4.952)	(4.711)	(5.246)	(5.395)

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$ (two-tailed test).
All models control for the set of respondent and background characteristics listed in Table 1.
[a] Robust standard errors (clustered at the household level) are reported in parentheses.

Table 5
Estimated effects of past parental joblessness on mental health in adulthood: alternative specifications (unstandardized coefficients from multilevel structural equation models)[a].

	Alternative (i.e., traditional) explanatory variables (1)	Sub-sample		
		Lived only in single-parent HH (2)	Lived only in dual-parent HH (3)	Lived in both single-parent and dual-parent HHs (4)
Father jobless, mother employed	−1.006			
	(3.124)			
Mother jobless, father employed	1.468			
	(3.200)			
Parental joblessness		−5.521*	−4.812*	−0.537
		(2.153)	(2.027)	(2.187)
N households	1398	236	1017	510
N respondents	2385	306	1763	728
N person-year observations	19,376	2311	14,546	5565
Variance (individual)	99.684***	99.999***	92.676***	117.119***
	(5.322)	(18.454)	(5.667)	(12.472)
Variance (household)	28.841***	18.354	24.790***	34.180***
	(4.919)	(16.453)	(5.169)	(11.180)

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$ (two-tailed test).
All models control for the set of respondent and background characteristics listed in Table 1.
[a] Robust standard errors (clustered at the household level) are reported in parentheses.

et al., 2017; Miller et al., 2011). Our study also contributed to knowledge by more clearly delineating the complex pathways through which this intergenerational process operates. We found that mental health effects operated mainly directly, and thus contrary to our hypotheses, most of this effect was not explained by mediating mechanisms. If parental joblessness depresses children's health outcomes by adoption and persistence of unhealthy lifestyle behaviours, early exposure to parental joblessness may be most harmful, as its effects may be mediated by deficits in the development of mental and general well-being, which may help explain the remaining direct effect of parental joblessness (e.g., Anda et al., 2006). In contrast, effects on general health, while slightly smaller, were (in line with most of our hypotheses) the result of more complex pathways operating through family income and family harmony. Also perhaps surprising, we found little evidence that parental time inputs mediated the influence of parental joblessness on children's health. The absence of mediating effects might imply that it is the quality, rather than quantity, of parenting time that is more important for children's adult health. We also found the effects of parental joblessness to vary across different household contexts, suggesting that children in two-parent jobless households are a group that is distinct from those where either parent (but not both) is jobless. The heterogeneity in the effects of parental joblessness points toward avenues for further research that explore, map and investigate the social determinants of health among children exposed to early disadvantage in different household contexts.

An important question is whether the magnitude of these effects is large or not. A total effect of around four points is relatively large compared to the estimated coefficients on other covariates included in our model. For example, the covariate with the largest association with adult health outcomes is, as would be expected, the presence of a long-term health impairment. The coefficient on this variable was estimated to be −6.1 for general health, but only −2.6 for mental health. The estimated four-point impact of parental joblessness, however, requires parents to be continually jobless over the observation period, which is only the case for 4.4% of our sample. For shorter exposures the magnitude is smaller, though estimated effects are still sizeable at 50% exposure (and 10.8% of our sample met or surpassed this threshold). We have thus found sizeable effects that apply to a relatively small proportion of the sample. This is entirely unsurprising: For many joblessness is a fleeting, temporary experience, but for a minority of families it can be protracted and long-lasting, and it is the children in these families who are at most risk of long-term health problems.

In summary, the results presented here complement and extend on findings from other recent studies reporting negative associations between parental joblessness and children's contemporaneous and short-term health effects (e.g., Liu & Zhao, 2014; Mörk et al., 2014; Pieters & Rawlings, 2020; Schaller & Zerpa, 2019). Most importantly, we found that the adverse effects of parental job loss on child health can, if the exposure is protracted, be long lasting and extend well into early adulthood.

Our study is not without limitations and so results should be interpreted with caution. First, our analyses are unable to rule out spuriousness arising from unobserved factors that may be correlated with both parental joblessness and children's health, such as genetic endowments. Other unobserved factors, such as the extent and strength of social networks, might also help elucidate more clearly some of the proposed causal processes if they could be observed. Second, despite the size of the HILDA Survey sample, the need to match parents to their children in adulthood necessarily results in a much smaller sample available for analysis and hence more imprecise estimates. This might, for example, explain the insignificant estimate on the direct effect of parental joblessness on general health. Third, in the absence of an experiment, we are unable to claim that the associations estimated are strictly causal.

6. Conclusions

We examined the link between past exposure to parental joblessness and adult mental and general health. Our findings point to persistent and chronic health effects attached to long-term exposure to parental joblessness during childhood, particularly when both parents experience joblessness simultaneously. Our results also suggest that parents' continuous paid employment is a critical determinant of children's later health, and especially their mental health. Such findings provide initial support for a jobs-first policy emphasis. Accordingly, future policy should pay attention to programs that target better links with potential employers to help jobless parents find employment sooner. Reducing spells of joblessness among parents could help circumvent spillover

effects on children's health through the work-role models they see, or through improved family harmony and higher financial investments in activities that promote children's health. Finally, our results signal the need for further research that unpacks the structural and social factors that lead to dual joblessness in two-parent households.

Ethical statement

This paper was supported by funding from the Australian Research Council (DP160101063). It uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey (as approved by the University of Melbourne Research Ethics ID no. 1955879). The HILDA Survey Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the authors and should not be attributed to either DSS or the Melbourne Institute.

Author statement

All authors have contributed equally.

Declaration of competing interest

None.

Acknowledgements

This paper was supported by funding from the Australian Research Council (DP160101063). It uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Survey Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the authors and should not be attributed to either DSS or the Melbourne Institute.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ssmph.2022.101144.

References

Almond, D., Currie, J., & Duque, V. (2018). Childhood circumstances and adult outcomes: Act II. *Journal of Economic Literature, 56*(4), 1360–1446.

Anda, R. F., Felitti, V. J., Bremner, D. J. D., Walker, J. D., Whitfield, C., Perry, B. D., Dube, S. R., & Giles, W. H. (2006). The enduring effects of abuse and related adverse experiences in childhood. *European Archives of Psychiatry and Clinical Neuroscience, 256*(3), 174–186.

Anderson, P. M., Butcher, K. F., & Schanzenbach, D. W. (2009). Childhood disadvantage and obesity: Is nurture trumping nature? In J. Gruber (Ed.), *An economics perspective on the problems of disadvantaged youth* (pp. 149–180). Cambridge (MA): National Bureau of Economic Research.

Becker, G. S., & Tomes, N. (1986). Human capital and the rise and fall of families. *Journal of Labor Economics, 4*(3, Part 2), S1–S39.

Blau, P. M., & Duncan, O. D. (1967). *The American occupational structure*. New York: John Wiley & Sons.

Cawley, J., & Liu, F. (2012). Maternal employment and childhood obesity: A search for mechanisms in time use data. *Economics and Human Biology, 10*(4), 352–364.

Conger, R. D., Conger, K. J., & Martin, M. J. (2010). Socioeconomic status, family processes, and individual development. *Journal of Marriage and Family, 72*(3), 685–704.

Conger, R. D., Elder, G. H., Jr., Lorenz, F. O., Conger, K. J., Simons, R. L., Whitbeck, L. B., Huck, S., & Melby, J. N. (1990). Linking economic hardship to marital quality and instability. *Journal of Marriage and Family, 52*(3), 643–656.

Currie, J. (2009). Healthy, wealthy, and wise: Socioeconomic status, poor health in childhood, and human capital development. *Journal of Economic Literature, 47*(1), 87–122.

Fairbrother, G. L., Carle, A. C., Cassedy, A., & Newacheck, P. W. (2010). The impact of parental job loss on children's health insurance coverage. *Health Affairs, 29*(7), 1343–1349.

Francesconi, M., & Heckman, J. J. (2016). Child development and parental investment: Introduction. *The Economic Journal, 126*(596), F1–F27.

Grossman, M. (1972). On the concept of health capital and the demand for health. *Journal of Political Economy, 80*(2), 223–255.

Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., Jones, L., & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: A systematic review and meta-analysis. *The Lancet Public Health, 2*(8), e356–366.

Jacobson, L. (2000). The family as producer of health - an extended Grossman model. *Journal of Health Economics, 19*(5), 611–637.

Jo, Y. (2014). What money can buy: Family income and childhood obesity. *Economics and Human Biology, 15*, 1–12.

Kalil, A., Ryan, R., & Chor, E. (2014). Time investments in children across family structures. *The Annals of the American Academy of Political and Social Science, 654*(1), 150–168.

Leininger, L. J., & Kalil, A. (2014). Economic strain and children's behavior in the aftermath of the Great Recession. *Journal of Marriage and Family, 76*(5), 998–1010.

Lindo, J. M. (2011). Parental job loss and infant health. *Journal of Health Economics, 30*(5), 869–879.

Liu, H., & Zhao, Z. (2014). Parental job loss and children's health: Ten years after the massive layoff of the SOEs' workers in China. *China Economic Review, 31*, 303–319.

Masarik, A. S., & Conger, R. D. (2017). Stress and child development: A review of the family stress model. *Current Opinion in Psychology, 13*, 85–90.

Matthews, K. A., & Gallo, L. C. (2011). Psychological perspectives on pathways linking socioeconomic status and physical health. *Annual Review of Psychology, 62*, 501–530.

Miller, G. E., Chen, E., & Parker, K. J. (2011). Psychological stress in childhood and susceptibility to the chronic diseases of aging: Moving toward a model of behavioral and biological mechanisms. *Psychological Bulletin, 137*(6), 959–997.

Mörk, E., Sjögren, A., & Svaleryd, H. (2014). Parental unemployment and child health. *CESifo Economic Studies, 60*(2), 366–401.

Pechey, R., & Monsivais, P. (2016). Socioeconomic inequalities in the healthiness of food choices: Exploring the contributions of food expenditures. *Preventive Medicine, 88*, 203–209.

Pieters, J., & Rawlings, S. (2020). Parental unemployment and child health in China. *Review of Economics of the Household, 18*(1), 207–237.

Sandberg, J. F., & Hofferth, S. L. (2001). Changes in children's time with parents: United States, 1981-1997. *Demography, 38*(3), 423–436.

Schaller, J., & Zerpa, M. (2019). Short-run effects of parental job loss on child health. *American Journal of Health Economics, 5*(1), 8–41.

Skrondal, A., & Rabe-Hesketh, S. (2004). *Generalized latent variable modeling: Multilevel, longitudinal, and structural equation models*. New York: Chapman and Hall/CRC Press.

Strohschein, L. (2005). Household income histories and child mental health trajectories. *Journal of Health and Social Behavior, 46*(4), 359–375.

Summerfield, M., Garrard, B., Hahn, M., Jin, Y., Kamath, R., Macalalad, N., Watson, N., Wilkins, R., & Wooden, M. (2020). *HILDA user manual - release 19*. Melbourne: Melbourne Institute of Applied Economic and Social Research, University of Melbourne.

Verbeek, M., & Nijman, T. (1992). Testing for selectivity bias in panel data models. *International Economic Review, 33*(3), 681–703.

Ware, J. E., Jr., with Snow, K. K., Kosinski, M., & Gandek, B. (2000). *SF-36 health survey: Manual and interpretation guide*. Lincoln (RI): QualityMetric Incorporated.

Watson, N., & Wooden, M. (2012). The HILDA survey: A case study in the design and development of a successful household panel survey. *Longitudinal and Life Course Studies, 3*(3), 369–381.