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Adult Children's Unemployment and Parental Mental Health in India: Social and Economic Moderators

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Abstract

This study explores the relationship between adult children's unemployment and parental mental health. Given India's vast inequalities in social capital and income, we examine their moderating effects on this relationship. We use data from the Longitudinal Ageing Survey of India, including 73,396 individuals aged 45 and above. We consider exposure to the unemployment of adult children as a treatment and measure parental risk of depression using the CES-D score, with respondents reporting four or more symptoms out of 10 considered "depressed". We employ inverse probability weighting based on the logistic regression model to form a pseudo-control group, accounting for the confounding demographic and socio-economic factors. Our findings show a 3.11 percentage point (ppt) increase in absolute terms (and a 12.30% relative increase) in the probability of parental depression associated with adult children's unemployment. Moderation analyses reveal that among older adults with high social participation, there is no increase in their risk of depression following their children's unemployment. Similarly, among older adults residing in low and medium-income inequality states, the negative consequences of their children's unemployment are weaker. Overall, this research concludes that while adult children's unemployment is associated with an increased risk of parental depression, higher social participation and residing in low or medium-income inequality states have protective effects on older adults' mental health following their children's

unemployment. Governments may consider expanding labour market policies supporting youth labour market entry as a means to improve not only the employability of younger individuals, but also the well-being of older generations.

Keywords: Parental Mental Health; Adult Children's Unemployment; Social Capital; Income Inequality; India.

Introduction

Parents with well-educated children tend to be more satisfied with life and to have healthier and longer lives (Mustafa and Shekhar, 2024; Sabater, Graham and Marshall, 2020; Smith-Greenaway, Brauner-Otto and Axinn, 2018). A small but growing body of evidence suggests that how adult children fare in their working lives is a plausible mechanism behind these intergenerational cross-over effects. This is theoretically well-explained by the "linked lives" principle of life course research proposed by Elder Jr (1998), which states that human lives are lived interdependently within families, and the misfortunes of individual family members are shared through relationships. Thus, we can expect to observe that exposure to their children's unemployment can affect parents' mental health. Offspring unemployment has been shown to negatively affect parents' psychological well-being and mental health in the UK (Albertini and Piccitto, 2023). The latter study also found that their children's transition to unemployment has a negative effect on mothers' mental well-being, whereas changes in fathers' distress levels are non-significant following their children's unemployment. Bister and colleagues (2025) additionally found that the magnitude of these effects varies across welfare state regimes and macro-economic contexts, and thus called for a more detailed examination of the factors that protect parents' health.

The life course literature situates individual health outcomes within broader social and institutional contexts (Hayward and Sheehan, 2016), and posits that social environments and institutions represent powerful forces that shape both exposures and responses to adverse experiences such as unemployment. Hence, while the "linked lives" perspective provides strong

arguments for a negative relationship between adult children's adverse labour market experiences and parental mental health, this relationship is unlikely to be universal across all families and contexts (Bister et al., 2025). Recent studies have shown that adverse economic experiences within families may have quite different consequences depending on a broad range of individual and contextual factors (Torche et al., 2024; Aquino et al., 2022).

The literature on the heterogeneous effects of adverse events has focused on events that happen to parents, and on how national or sub-national policies can protect children (see, e.g., Baranowska-Rataj et al., 2024; Hansen & Stutzer, 2022). However, we argue that heterogeneous effects can also be expected when studying the reverse exposures, i.e., the influence of adult children's unemployment on parental mental health. We propose a novel framework for explaining how high levels of social participation as well as low levels of income inequality may constitute contextual factors that reduce the otherwise negative influences of adult children's unemployment on their parents. This study makes three important contributions to the literature.

First, this study adds to the growing body of research on the heterogeneous effects of adverse experiences in human lives. Specifically, it expands the knowledge of factors that shield older adults' mental health when they are exposed to adverse economic circumstances among their adult children. Second, we advance the knowledge of health inequalities in India, the largest country in the world. Previous research on the impact of adult children's unemployment on parental mental health has been restricted to European societies (Albertini & Piccitto, 2022; Bister et al., 2025), and thus has not taken into account the experiences of countries in the Global South. India is a highly relevant context for the present study given the prevalence of strong familial ties and intergenerational financial transfers to parents from their adult children in Indian society. India also has vast state-level heterogeneities in social participation and income levels (Chandrasekhar et al., 2021), which we expect to moderate the relationship between adult children's unemployment and parental risk of depression. Third, our study adds to the literature on the role of social capital and income inequalities in population health. Although a significant body of research has documented the positive impact of social participation and income equality on population health (Pickett & Wilkinson, 2015; Villalonga-Olives & Kawachi, 2017; Moore &

Kawachi, 2017), there is less research examining their effects at the individual level. Our study investigates not just whether social participation and income inequality can affect health outcomes “on average”, but also how these contextual factors affect health among vulnerable groups, such as parents with unemployed children. We argue and empirically demonstrate the role of these contextual factors in limiting mental health disparities among older adults in India.

Theoretical framework

Children’s unemployment can negatively impact parents’ mental health through several mechanisms. One primary channel might be financial strain, particularly in contexts where parents provide ongoing economic support to their unemployed adult children, which may increase their stress and anxiety (Umberson et al., 2010). This financial burden is often compounded by emotional distress, as parents with unemployed children may experience feelings of failure or guilt, worry about their children’s future, or perceive their children’s unemployment as a reflection of their own shortcomings as caregivers (Fingerman et al., 2015). Additionally, unemployment can disrupt family dynamics by increasing tensions within the family, leading to conflicts and strained relationships, which may further contribute to parental stress (Pillemer & Lüscher, 2004). Moreover, parents may suffer from social stigma, as unemployment is often associated with negative societal perceptions, especially in countries with a more unequal income distribution (Paul and Moser, 2009).

Social participation as a moderator

In this study, we argue that social participation may block some of the mechanisms related to the negative impact of adult children’s unemployment on parental mental health. Generally, social participation is seen as a key determinant of healthy ageing (Levasseur et al., 2010), as it encompasses all kinds of activities related to developing and maintaining a variety of social relationships and forms of involvement in the local community, such as interactions with neighbours and friends, as well as engagement in voluntary work and participation in local leisure and social activities. Lu et al. (2022) and Sirven and Debrand (2008) found that social participation leads to healthy ageing in the Japanese and European contexts. It can, however, be challenging to maintain and initiate new relationships at older ages due to declining physical functionality,

which might limit social participation (Leung et al., 2021). Thus, we also match on older adults' multimorbidity and self-reported health, which might determine their levels of social participation.

By strengthening the social ties between older adults and the communities in which they live, social participation can be expected to help older adults access resources and support through their connections to others. These connections can be particularly important on "rainy days", for instance, when older adults find themselves in circumstances in which their need for emotional or instrumental support is particularly acute. A study by Ang (2018) examining the development of social participation and health throughout the life course among Americans found that formal social participation has a protective effect on men's mental health as they age, while its effects remain consistent for women across all age groups. A longitudinal study on social participation in the European context also found that it is an important factor in cognitive functioning and successful ageing (Bourassa et al., 2017).

Social connections may help older adults maintain lifestyles and habits that protect their mental health by enacting positive informal social control (Young et al., 2004). Social connections can also serve as an important channel for the provision of support by either providing relief to older adults who are at risk of experiencing poorer mental health or solving the problems that generated this risk in the first place. For instance, when older adults become exposed to their children's unemployment, their social connections can help them access emotional support to alleviate their feelings of sadness, failure, or guilt, and to prevent them from blaming their offspring's unemployment on their own shortcomings as parents (Fingerman et al., 2015). If unemployment causes disruptions in family dynamics, older adults' social connections may partly compensate for their missing contacts or even mediate in any family conflicts they have with their adult children. Parents' social connections may also provide them with information about job opportunities, which can increase their adult children's chances of re-employment. Thus, receiving instrumental support may reduce parents' worries about their children's future and help them to re-establish feelings of control over their own and their family's economic situation.

The moderating role of income inequality

One of the arguments behind the theoretical expectation that parental mental health is negatively affected by their children's unemployment relates to social stigma (Hatzenbuehler & Link, 2014; Hatzenbuehler et al., 2013). The social stigma associated with unemployment may extend not only to the unemployed adult children, but also to their parents, thus lowering the social status of the whole family (Inglis et al., 2023). Negative societal perceptions of unemployment tend to be stronger in countries with more pronounced income inequalities (Paul & Moser, 2009). Thus, in national or subnational contexts with large disparities between the rich and the poor, having an unemployed family member may lead to feelings of status anxiety, stress, and shame.

High-income inequality may also create a context in which losing a job is more economically damaging and increases the financial strain within a family. This is especially likely to occur in countries with strong intergenerational ties such as India, where family members are obliged to provide ongoing economic support to each other, and adult children in particular are expected to provide financial support to their parents (Nagargoje et al., 2024). Moreover, the unemployment of high-income adult children can intensify parental insecurities about their children's future prospects, as parents in more unequal societies may feel heightened concern about their children's ability to compete for resources and opportunities (Wilkinson & Pickett, 2018).

Indian context

This study is relevant to the Indian context because India has the second-largest absolute number of older individuals in the world, despite having a relatively young population. Currently, there are 140 million people aged 60 or older in India, and this number is projected to rise to 320 million by 2050 (United Nations, 2024). The rapid ageing of the Indian population is worrying policymakers due to the amount of healthcare that the large elderly population is projected to need in the future, especially as the current levels of pension and healthcare benefits provided to older adults by the government are not sufficient. In India, only 18% of the population aged 60 and above are covered by health insurance. Thus, older adults depend heavily on their adult children for financial and healthcare support, and, due to the prevalence of strong familial ties in

India, adult children are expected to provide intergenerational financial support to their parents (Nagargoje et al., 2024). However, the current skills gap among Indian youth is concerning. According to the India Employment Report 2024 published by the International Labour Organization, young people constitutes 83% of the unemployed workforce in India. A particularly worrying trend is that young people with secondary or higher education made up 65.7% of unemployed youth in 2022, compared to 35.2% in 2000. The report describes the lack of employable skills among today's youth, and indicates that the Indian economy is unable to create quality jobs for them. This creates a dual concern for older adults as, in addition to worrying about the effects of unemployment on their children's well-being, they may be concerned about whether their children will be able to provide for their own financial and healthcare needs.

Data & Methods

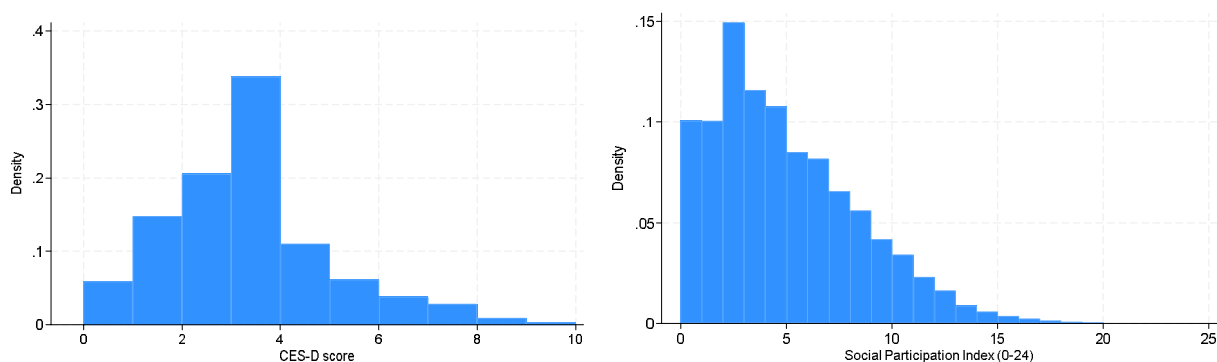
The Longitudinal Ageing Survey of India

For this study, we use data from the Longitudinal Ageing Survey of India's (LASI) first available wave (2017-18), which includes 73,396 adults above age 45. All of the selected respondents with children are asked whether their children are currently studying, employed, self-employed, unemployed, or have some other status. For children living with their elderly parents, we obtain this information by matching their socio-demographic characteristics from household roster files based on their household member ID. Similarly, we add employment information for children living in the same household as their parents by using household files and checking whether they are engaged in business, salaried, or agricultural jobs. We then code the children's employment status into a binary indicator by coding employed/self-employed individuals as zero and unemployed individuals as one. We generate the combined children's unemployment indicator by considering the employment status of the first eight adult children (children above age 21). The indicator is coded as zero if all the children are employed and is coded as one if any of the first eight adult children is unemployed. We identify 54,543 older adults with children who have no unemployed adult children according to this treatment indicator, and 15,241 older adults with at least one unemployed adult child.

Mental health

We measure parental mental health using the CES-D score, with respondents reporting four or more symptoms out of 10 considered “depressed” (Kumar et al., 2016). CES-D is a short self-report scale designed as a screening tool for depressive symptoms in the general population (Radloff, 1977). The original CES-D scale is a 20-item scale, but LASI uses a shortened 10-item CES-D scale, which has also been validated by several studies for measuring self-reported depression (Zhang et al., 2012; Mohebbi et al., 2018). We measure parental mental health using the CES-D score out of 10. The 10 items include: seven negative symptoms (trouble concentrating, feeling depressed, low energy, fear of something, feeling alone, bothered by things, and everything is an effort), and three positive symptoms (feeling happy, hopeful, and satisfied). For negative symptoms, the rarely or never (<1 day) and sometimes (1-2 days) categories are scored as zero, while the often (3-4 days) and most or all of the time (5-7 days) categories are scored as one. The scoring is reversed for the positive symptoms. Figure 1 shows the distribution of the CES-D score in our sample. Around 25% of the elderly individuals in our sample have four or more symptoms out of 10, which is considered “depressed” in our analysis.

Figure 1: Distribution of the CES-D score and the Social Participation Index in LASI 2017-18



Social participation

We construct the social participation of older adults variable based on the measure developed by Rana et al. (2022). The indicator is based on the responses to six questions on the frequency of (a) attending organisations, clubs, or social meetings/gatherings; (b) visiting relatives/friends; (c) attending cultural performances, shows, or the cinema; (d) attending religious functions/events such as bhajan, Satsang, or prayer; (e) attending political, community, or

organisation group meetings; and (f) meeting with friends. Frequency of attending/visiting/meeting is coded as zero for never, one for at least once a year, two for at least once a month, three for at least once a week, and four for daily. The social participation score is the sum of all these codes on a scale ranging from zero to 24. Figure 1 also shows the distribution of the Social Participation Index in our sample. Furthermore, we divide this measure into three tertiles: i.e., first (0-2), second (3-5), and third tertiles (6+).

Income inequality

We check whether income inequality at the state level moderates the relationship between children's unemployment and parents' mental health using the Gini coefficient at the state level calculated by Chandrasekhar et al. (2021) using PLFS 2018-19 data. We divide the states into three equal tertiles based on their Gini score: i.e., low inequality, medium inequality, and high inequality states.

Statistical analyses

To account for confounders in our study, we use the matching estimators approach in our observational data. Accounting for potential confounding is important due to the selection of parents based on their characteristics, such as low education, poor job, and poor health, which, in turn, tend to predict their children's selection into unemployment. We use the inverse probability weighting (IPW) approach to estimate the average treatment effect on the treated (ATET) of children's unemployment on the probability of depression for older adults using a logistic regression model. Our matching model includes individuals' characteristics, such as age, sex, education, monthly per capita consumption expenditure (MPCE), multimorbidity, work status, self-reported health (SRH), marital status, number of children, and living arrangements.

This inverse probability weighting method first calculates the probability of being treated using a logistic regression model. Thus, we first model adult children's unemployment status on the matching variables using logistic regression, then calculate the probability of being treated for older adults, and, finally, assign weights based on the inverse of the probability of being treated.

$$\begin{aligned}
 \text{Adult children employment}(i) = & \alpha(i) + \beta \text{ age}(i) + \beta_1 \text{ sex} + \beta_2 \text{ education}(i) + \beta_3 \text{ MPCE}(i) \\
 & + \beta_4 \text{ multimorbidity}(i) + \beta_5 \text{ working status}(i) + \beta_6 \text{ SRH}(i) + \beta_7 \text{ Marital status}(i) \\
 & + \beta_8 \text{ Living arrangements}(i) + \beta_9 \text{ No. of children}(i) + \varepsilon(i)
 \end{aligned}$$

Applying this generated weight helps to create the pseudo treatment and control groups balanced on the characteristics of older adults that can predict their children becoming unemployed using the nearest neighbour without replacement approach (Chesnaye et al., 2022). IPW uses the propensity score to generate weights for treated and control groups by weighting each individual by their probability of receiving treatment in the following way: [Weight (IPW) = 1/ Propensity score for the treated group] and [Weight (IPW)= 1/ (1-Propensity Score) for the control group]. Once the pseudo population for both the control and treatment groups has been created based on the re-weighting of the population using our weights generated by IPW, we run a linear regression on our treatment variable (adult children's unemployment) with the generated weights to compute our ATET.

$$y_i = \beta_0 + \beta_1 x_i + \epsilon_i$$

y_i : Binary classification based on Respondent i CES-D score ≥ 4 coded as 1 and < 4 coded as 0.

x_i : Combined Adult Children's employment status of respondent i .

We also check the suitability of IPW compared to propensity score matching (PSM) for balancing the covariates across groups after the matching procedure. Figure A.7 shows the absolute standardised mean differences for covariates before and after matching for IPW and PSM. We see that both matching techniques balance the covariates across the treatment and control groups. However, as IPW is more efficient than PSM, we use the former across all our main analyses. In our heterogeneity analysis, we interact our treatment variable with potential moderators, i.e., social participation and income inequality at the state level using the state's Gini coefficient described above. We run our analyses separately on subsamples of these categories of states, i.e., low, medium, and high inequality states. Similarly, we check the moderation effects of older adults' social participation on this relationship by running our analyses separately for three categories of social participation: low, medium, and high social participation.

Results

Main findings

The descriptive findings in Table 1 reveal the differences in the socio-economic and demographic characteristics of the older adults in the two groups. The group with at least one unemployed adult child is negatively selected, as it has higher proportions of older ages, low education, and multimorbidity compared to the group of older adults with no unemployed adult children. The older adults in this group are also more likely to be widowed and living alone compared to the older adults with no unemployed adult children. We can also see that 23.4% of the older adults in the control group who do not have an adult unemployed child are at risk of depression, compared to 27.7% of the older adults in the treatment group.

The treatment effects based on the IPW model in Figure 2 reveal that adult children's unemployment is associated with a 3.11 percentage point (ppt) increase in the probability of parental depression (12.30% relative increase in the risk of depression). This finding supports the "linked lives" theoretical perspective (Elder Jr, 1998), as it demonstrates that the poor socio-economic outcomes of adult children can be adversely linked to their parents' well-being, even in later life stages. Interestingly, our results displayed in Figure 3 also show no significant differences in the effect between fathers (3.73 ppts, 15.95% increase in relative terms) and mothers (2.65 ppts, 10% increase in relative terms). The latter observation contrasts with findings from the UK (Albertini & Piccitto, 2022) indicating that mothers are more affected than fathers. This may be related to cultural differences in family dynamics and gender roles between India and Western countries. Figure 3 also reveals the gender differences of the children who are unemployed. We find no significant differences in the increased risk of depression for parents with unemployed children based on whether their adult son or daughter is unemployed.

Moderating effects

Our analysis in Figure 4 indicates that for older individuals with high social participation levels, their adult children's unemployment has no significant effect (0.03 ppt increase) on their mental health, which highlights the importance of social connections and community engagement as buffers against stress and negative life events. By contrast, for older adults with low social

participation levels, the risk of depression increases 4.93 ppts (17.87% increase in relative terms) following their adult children's unemployment. This aligns well with the findings from the broader literature on social capital and health (Kawachi et al., 2004). In addition, Figure 4 shows that for older adults living in low and medium inequality states, the increase (2.62 ppt and 1 ppt increase, respectively) in their risk of depression following their children's unemployment is weaker than that for older adults living in high inequality states, who experience an increase of 7.21 percentage points (30% increase in relative terms). This suggests that living in a state with relative equality can act as a protective factor for individuals' mental health following their children's unemployment.

Robustness checks

We ran several additional checks to ensure the robustness of our findings. Figure A.1 shows the predicted probability of depression risk with four or more symptoms by children's employment status with 95% CIs. Our usual measure of the risk of depression (four or more symptoms) shows a baseline probability of depression (0.245), which increases by around 0.03 to 0.275 for older adults with unemployed adult children (relative increase in the risk of depression of 12.3%). Our robustness measure in Figures A.2 and A.3 shows the predicted probability of depression risk (five or more symptoms). The risk of depression measure (five or more symptoms) shows a baseline probability of depression (0.135), which increases by around 0.025 to 0.16 for older adults with unemployed adult children (relative increase in the risk of depression of 18.5%). Thus, in both measures, there is an increase in the risk of depression within a similar range using the CES-D scale.

We also conducted robustness checks to test whether older adults with high social participation levels already have a lower risk of depression. Figure A.4 shows the association between the Social Participation Index and the risk of depression using OLS regression. There is a slight decrease from 4.52 for older adults who are not at risk of depression to 4.43 for older adults who are at risk of depression. Figure A.5 shows a non-significant increase in the Social Participation Index by adult children's co-residence status with their parents. This confirms that the relationships between adult children's unemployment and parental mental health are

moderated by individuals' social participation levels, which are not dependent on whether the parents are depressed or their adult children co-reside with them. However, Figure A.6 shows that the co-residence of adult children acts as social capital for older adults by reducing their risk of depression from 0.265 to 0.245.

Discussion

Our study looked at whether adult children's unemployment is associated with parental mental health in India. Given that India has vast inequalities in social capital and income, we examined the moderating effects of income inequality and social participation on this relationship. Our findings show a 3.11 percentage point (ppt) increase in absolute terms (and a 12.30% relative increase) in the probability of parental depression associated with adult children's unemployment. This supports the "linked lives" principle (Elder Jr, 1998) by demonstrating that the poor socio-economic outcomes of adult children can be adversely linked to their parents' well-being, even in later life stages. Our findings on the overall negative impact of children's unemployment on parental mental health are consistent with studies from the UK (Albertini & Piccitto, 2022), whereas a study from Europe suggested that this phenomenon does not follow a universal pattern, with the relationship varying depending on the welfare and the country context (Bister et al., 2025). Interestingly, we observed no significant differences in the effect between fathers (3.73 ppts, 15.95% increase in relative terms) and mothers (2.65 ppts, 10% increase in relative terms). Our results showing a lack of gender differences contrast with findings from the UK. Similarly, we found no differences in effect sizes based on the adult children's gender. This highlights the importance of considering the cultural context when examining intergenerational effects.

Our heterogeneity analysis revealed that among older adults with high social participation, there is no increase in the risk of depression following their children's unemployment, while there is a moderate increase among older adults with medium social participation and a much larger increase among older adults with low social participation (4.93 ppts, 17.87% increase in relative terms). We also found that for adults in low and medium-income inequality states, the negative consequences of their children's unemployment are much weaker than those for older adults in

high-income inequality states, where the risk of depression increases by 7.21 percentage points (30% increase in relative terms). Overall, our study indicates that having substantial social capital and living in a state with low-income inequality can help to safeguard the mental health of older adults following their children's unemployment.

It is important to note the limitations of our study. While we establish a strong association, causal inferences are limited due to the cross-sectional nature of the data. Longitudinal research designs using data from the next waves of LASI could provide stronger evidence of causal relationships (Kawachi et al., 1997). Our binary classification of employment status may not capture the nuances of underemployment or precarious employment, as we could not check the length of the unemployment spell, which might have heterogeneous effects on parental mental health, as shown by Albertini and Piccitto (2022) for the UK. In addition, we do not have information on the adult children's reasons for being unemployed, which may clarify whether it is involuntary unemployment or voluntary economic inactivity. Since the temporal order of children's unemployment and parental depression cannot be established based on the data, we cannot claim a causal effect. Moreover, given the context of the labour market in India, it would be worthwhile to differentiate between employed adult children with diverging types of working conditions. Future studies could explore more detailed occupational classifications of children to gain insight into whether unemployment may be considered more favourable than working under stressful or harmful conditions. Moreover, we cannot provide evidence on the mechanisms leading to the increased parental risk of depression due to the cross-sectional nature of the data. Future research could also explore geographic differences in more detail to provide more fine-grained analysis of the vast inequalities in India.

Despite these limitations, our study makes several contributions to the literature. To our knowledge, we are the first to provide evidence that adult children's unemployment is associated with an increased risk of parental depression in the Indian context. This finding is in line with our expectations, given that parents tend to be emotionally and financially interdependent with their adult children at older ages. Similar studies conducted in the UK and European context examined the heterogeneities based on the children's unemployment duration and the employment context, such as the unemployment rate or the economic conditions. At the same time, we

provided evidence that non-employment factors, such as high social participation or residing in a low-income inequality state, could also shield the mental health of older adults following their children's unemployment, perhaps because they are able to find support in the community or through state government policies. Moreover, our findings are robust to the different specifications of the CES-D score for the risk of depression.

The lack of employable skills among today's youth, combined with the Indian economy's inability to create quality jobs, raises concerns for older adults. In addition to worrying about the effects of unemployment on their children's well-being, parents may be concerned about whether their unemployed children will be able to provide for their own financial and healthcare needs. Governments may consider expanding youth skills programs and employment guarantee schemes. Additionally, organising social activities for older adults could help to increase social participation and build protective social capital. Our findings regarding the protective effect of social participation suggest that interventions to enhance social connections among individuals could be beneficial for their mental health, particularly in the face of family stressors. Additionally, our findings on the moderating effect of income inequality at the state level indicate how effective state policies can be in providing economic security for older adults, including protection against negative impacts from their children's life events.

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Tables and Figures

Table 1: Descriptive characteristics of older adults across different groups (i.e., those whose adult children are employed and those with at least one unemployed adult child)

	Mean (Empl.)	SD	Mean (Unempl.)	SD	Difference	t-statistic
Risk of depression	0.234	0.423	0.277	0.447	-0.043***	-10.544
Gender						
Male	0.429	0.495	0.396	0.489	0.033***	-7.447
Female	0.571	0.495	0.604	0.489	-0.033***	(-7.447)
Education level						
No education	0.46	0.498	0.465	0.499	-0.005	(-1.191)
Primary education	0.239	0.426	0.273	0.446	-0.034***	(-8.483)
Secondary education	0.193	0.395	0.191	0.393	0.002	-0.454
Higher education	0.108	0.31	0.07	0.255	0.038***	-15.502
Age group						
45-59	0.491	0.5	0.4	0.49	0.092***	-20.32
60-69	0.244	0.429	0.328	0.469	-0.084***	(-19.832)
70-79	0.112	0.315	0.176	0.381	-0.064***	(-19.078)
80-84	0.023	0.151	0.038	0.192	-0.015***	(-8.917)
85+	0.018	0.131	0.028	0.166	-0.011***	(-7.398)
MPCE quintile	1.987	1.405	2.047	1.414	-0.060***	(-4.671)
Multimorbidity						
No multimorbidity	0.571	0.495	0.471	0.499	0.100***	-21.845
1 multimorbidity	0.265	0.441	0.288	0.453	-0.023***	(-5.603)
2+ multimorbidity	0.164	0.37	0.24	0.427	-0.076***	(-20.063)
Working status						
Never worked	0.279	0.449	0.372	0.483	-0.093***	(-21.246)
Currently working	0.49	0.5	0.32	0.467	0.170***	-39.118
Currently not working	0.229	0.421	0.306	0.461	-0.077***	(-18.540)
Self-reported health	2.154	0.993	2.252	0.993	-0.098***	(-10.721)
Marital status						
Married	0.797	0.402	0.721	0.449	0.076***	-19.009
Widowed	0.186	0.389	0.26	0.439	-0.075***	(-19.045)
Divorced or separated	0.017	0.13	0.019	0.136	-0.002	(-1.381)

Living arrangements						
Living alone	0.026	0.159	0.032	0.175	-0.006***	(-3.727)
Living with spouse	0.13	0.336	0.14	0.347	-0.010**	(-3.257)
Living with spouse & children	0.656	0.475	0.565	0.496	0.090***	-20.071
Living with children	0.166	0.372	0.239	0.426	-0.073***	(-19.138)
Living with children & others	0.023	0.149	0.024	0.154	-0.001	(-1.010)
Number of children						
1 child	0.096	0.295	0.05	0.217	0.046***	-21.451
2 children	0.262	0.44	0.189	0.392	0.073***	-19.71
3 children	0.251	0.433	0.251	0.433	0	(-0.001)
4 children	0.172	0.378	0.198	0.399	-0.026***	(-7.209)
5+ children	0.219	0.414	0.312	0.463	-0.093***	(-22.430)
Observations	54543		15241		69784	

Figure 2: Average treatment effect on the treated (ATET) of children's unemployment on the probability of depression for older adults by (i.) the parents' sex and (ii.) the unemployed children's sex

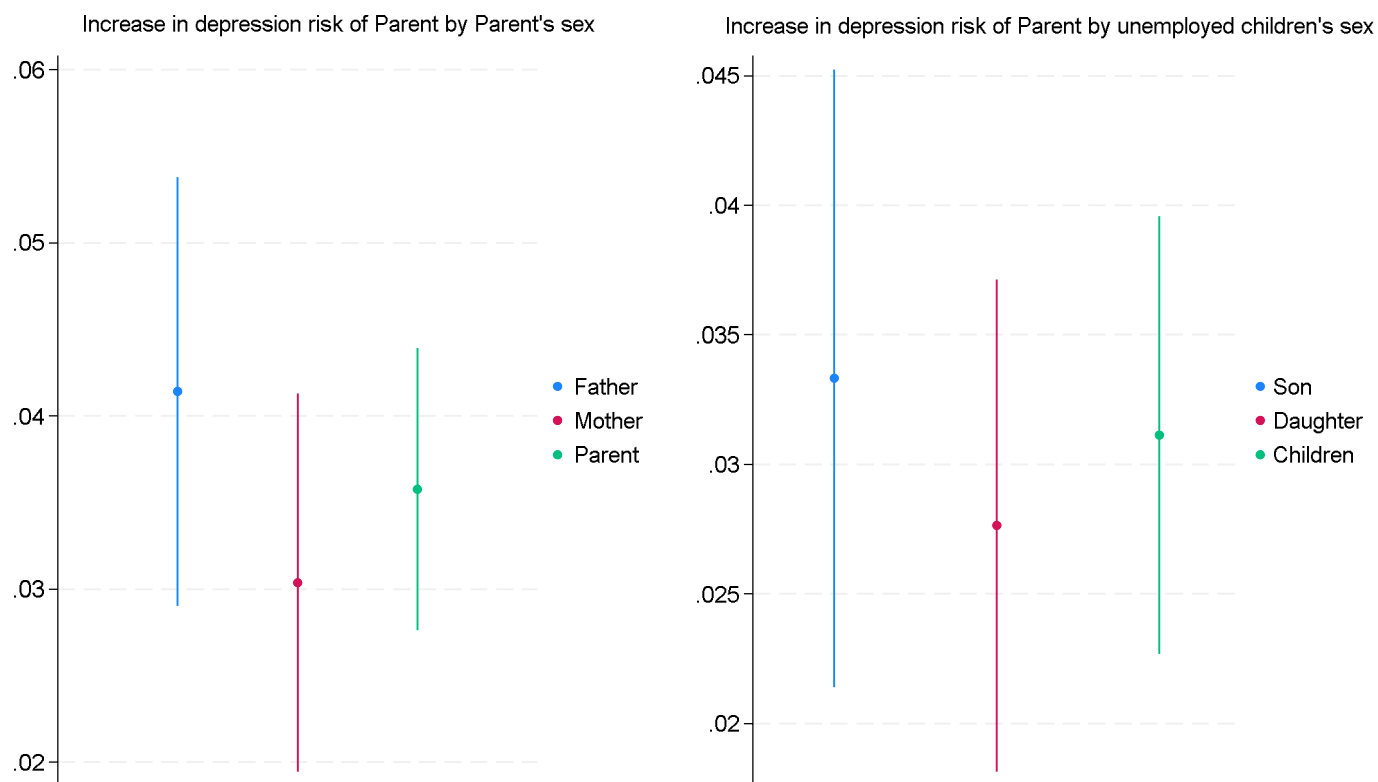
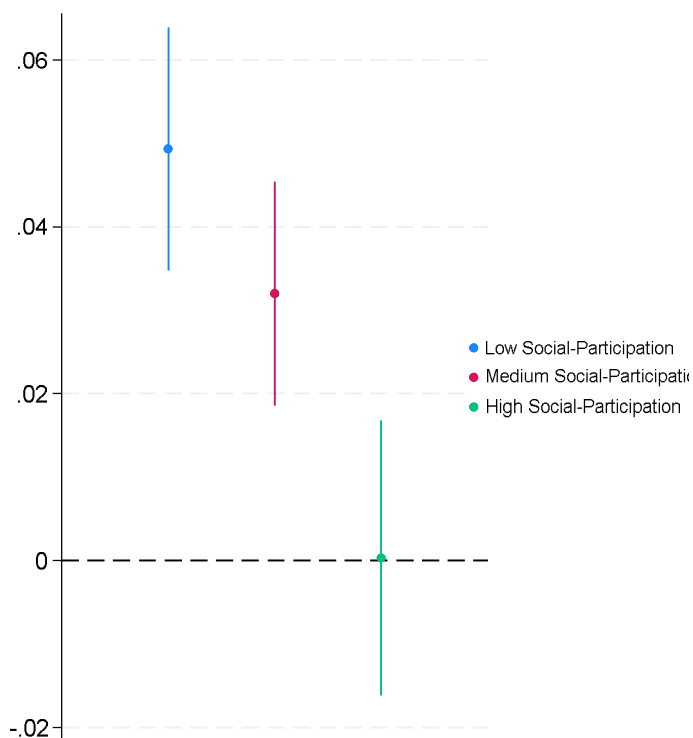
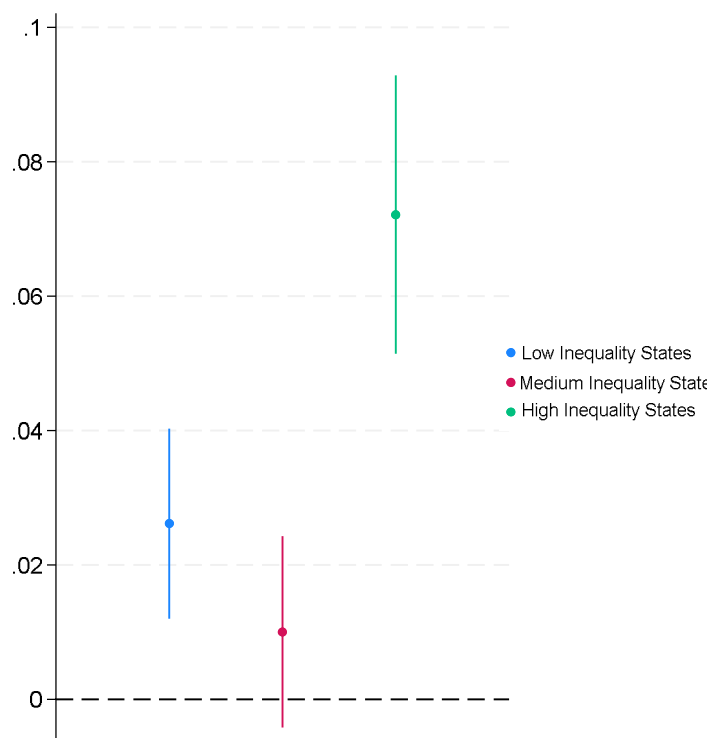


Figure 3: ATET of children's unemployment on the probability of major depression for older adults by (i.) their social participation and (ii.) their state's income inequality level

Increase in older adults depression risk by their social participation



Increase in older adult's depression risk by their state's income inequality



Robustness tests

Fig A.1: Predicted probability of depression (four or more symptoms) by children's employment status with 95% CIs

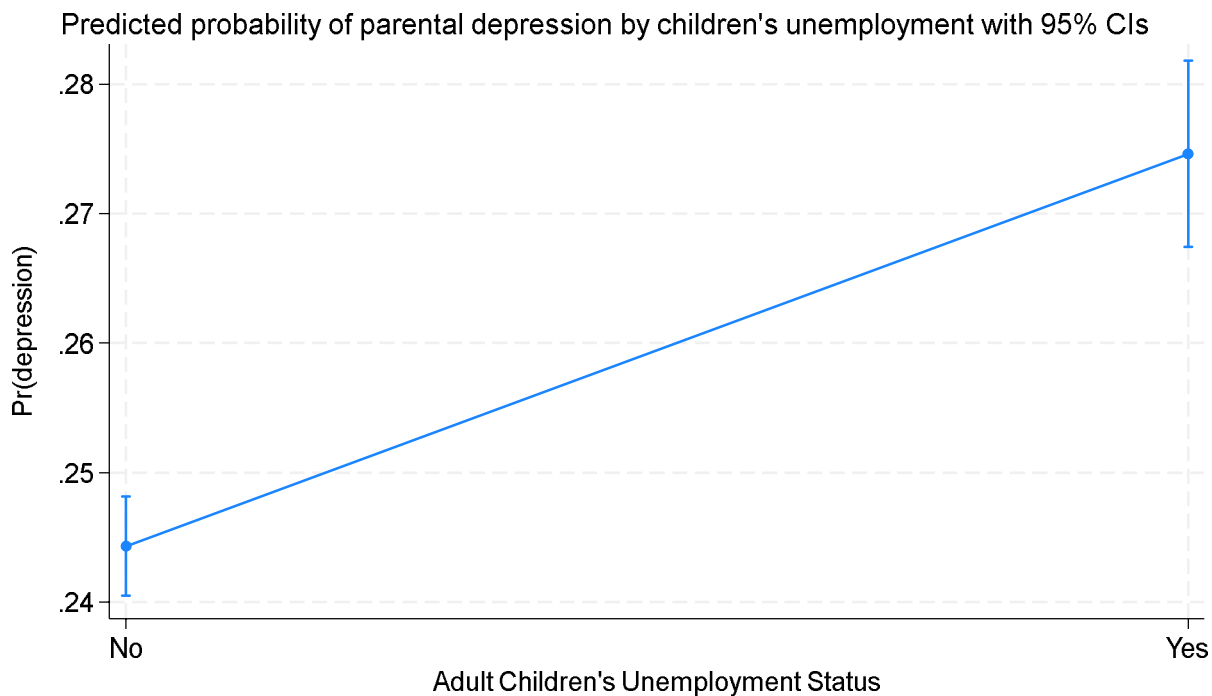


Fig A.2: Predicted probability of depression (five or more symptoms) by children's employment status with 95% CIs

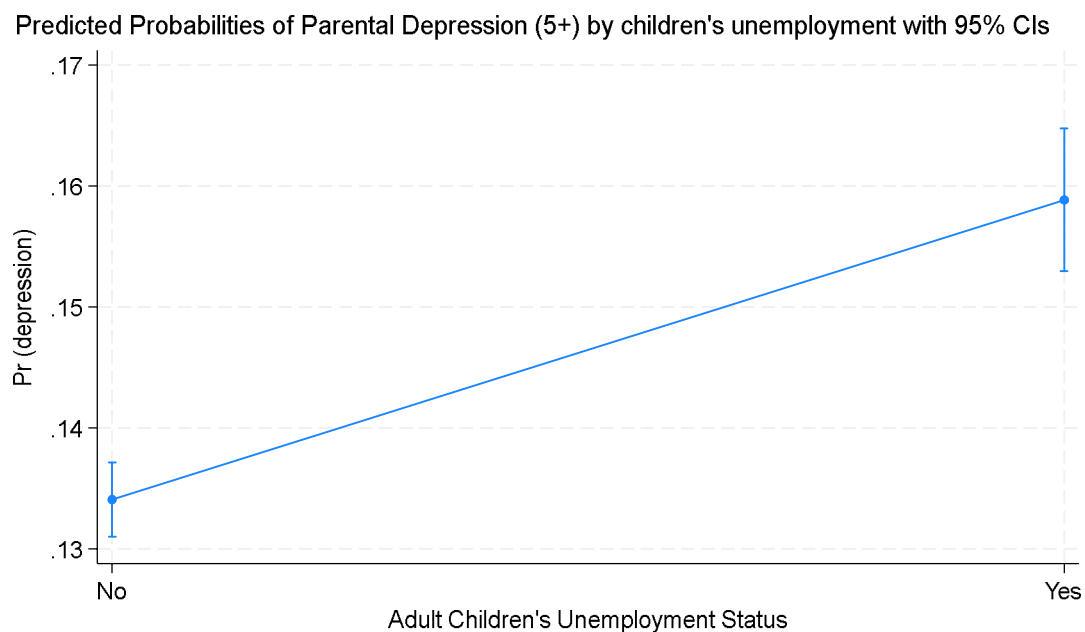


Fig A.3: Average treatment effect on the treated (ATET) of children's unemployment on the probability of depression (five or more symptoms) for older adults

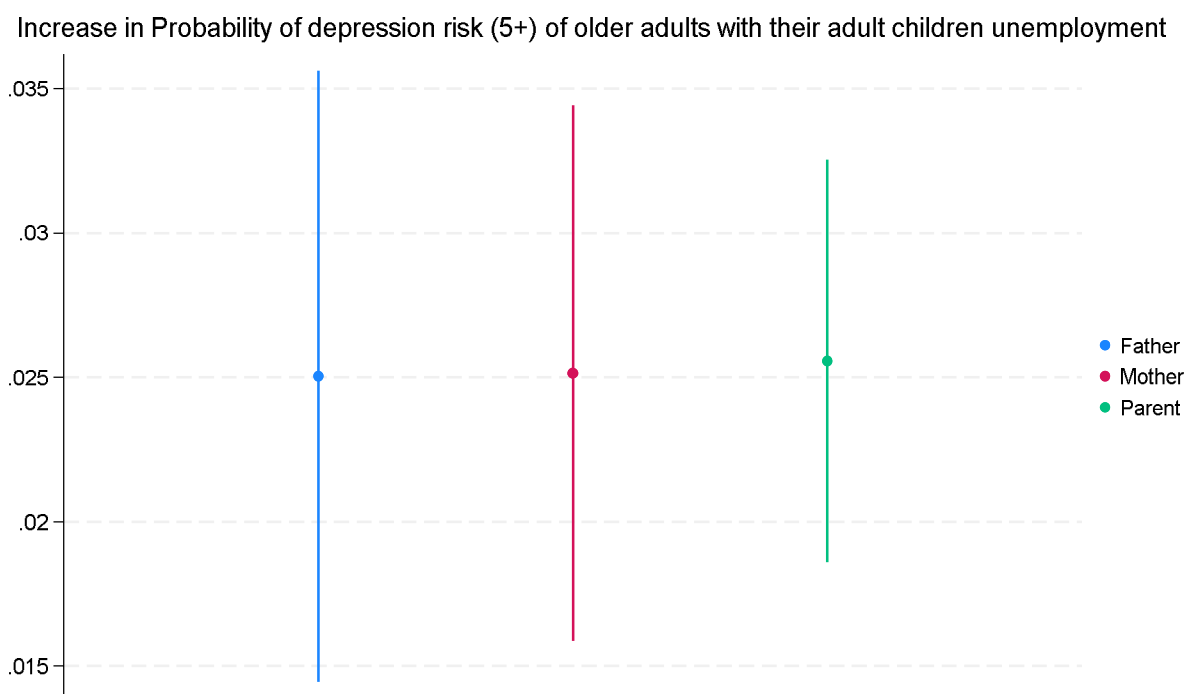


Fig A.4: Association between the risk of depression and the Social Participation Index using OLS regression

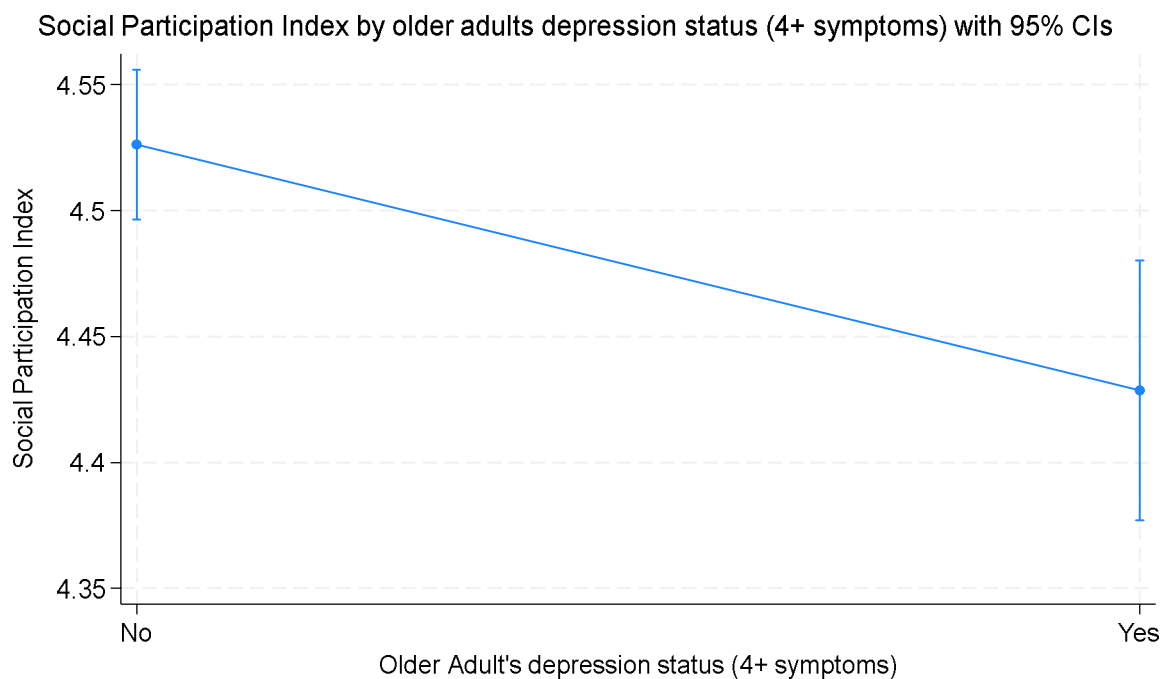


Fig A.5: Association between adult children's co-residence with their parents and the Social Participation Index using OLS regression

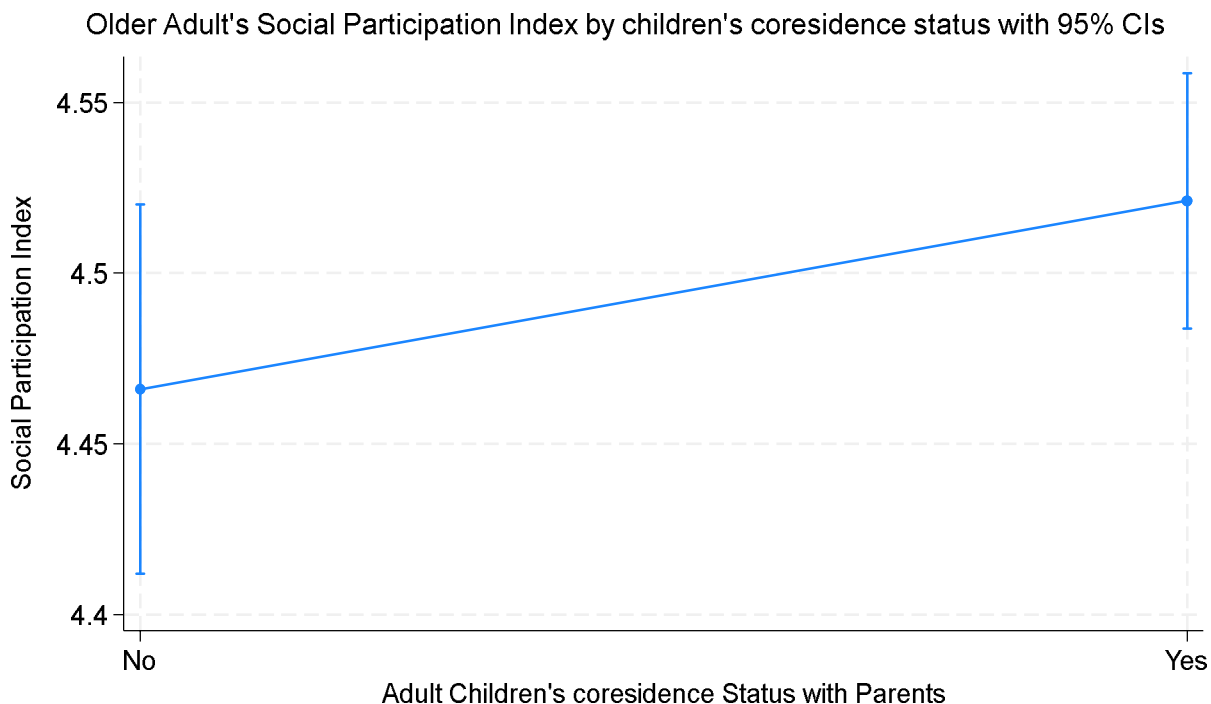


Fig A.6: Association between adult children's co-residence with their parents and the risk of depression using OLS regression

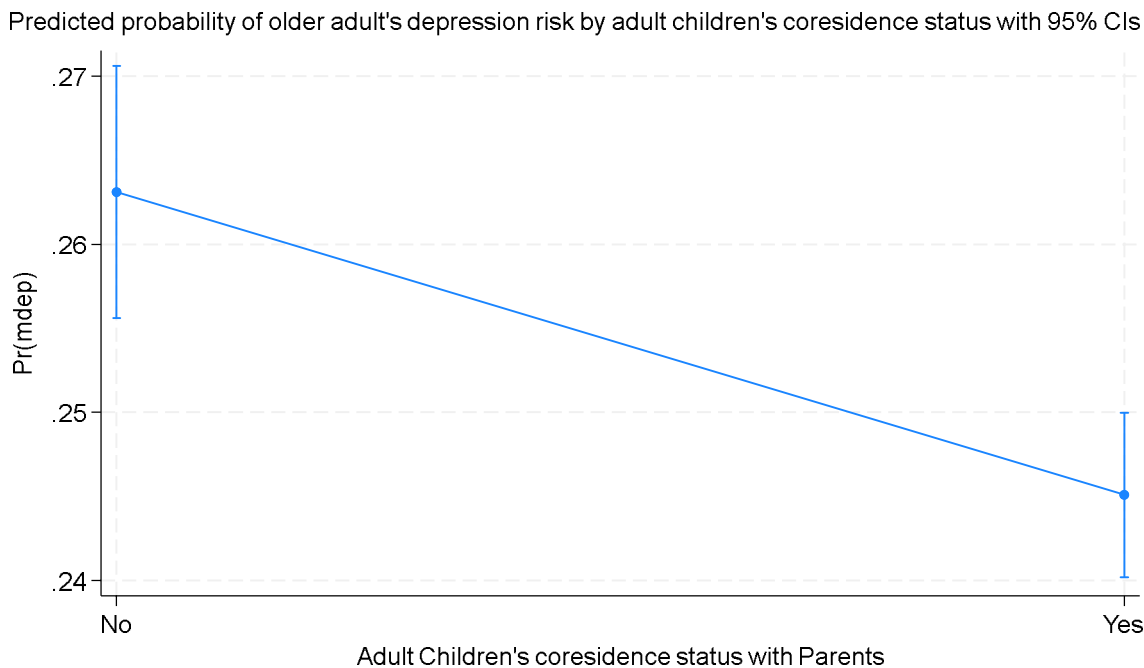
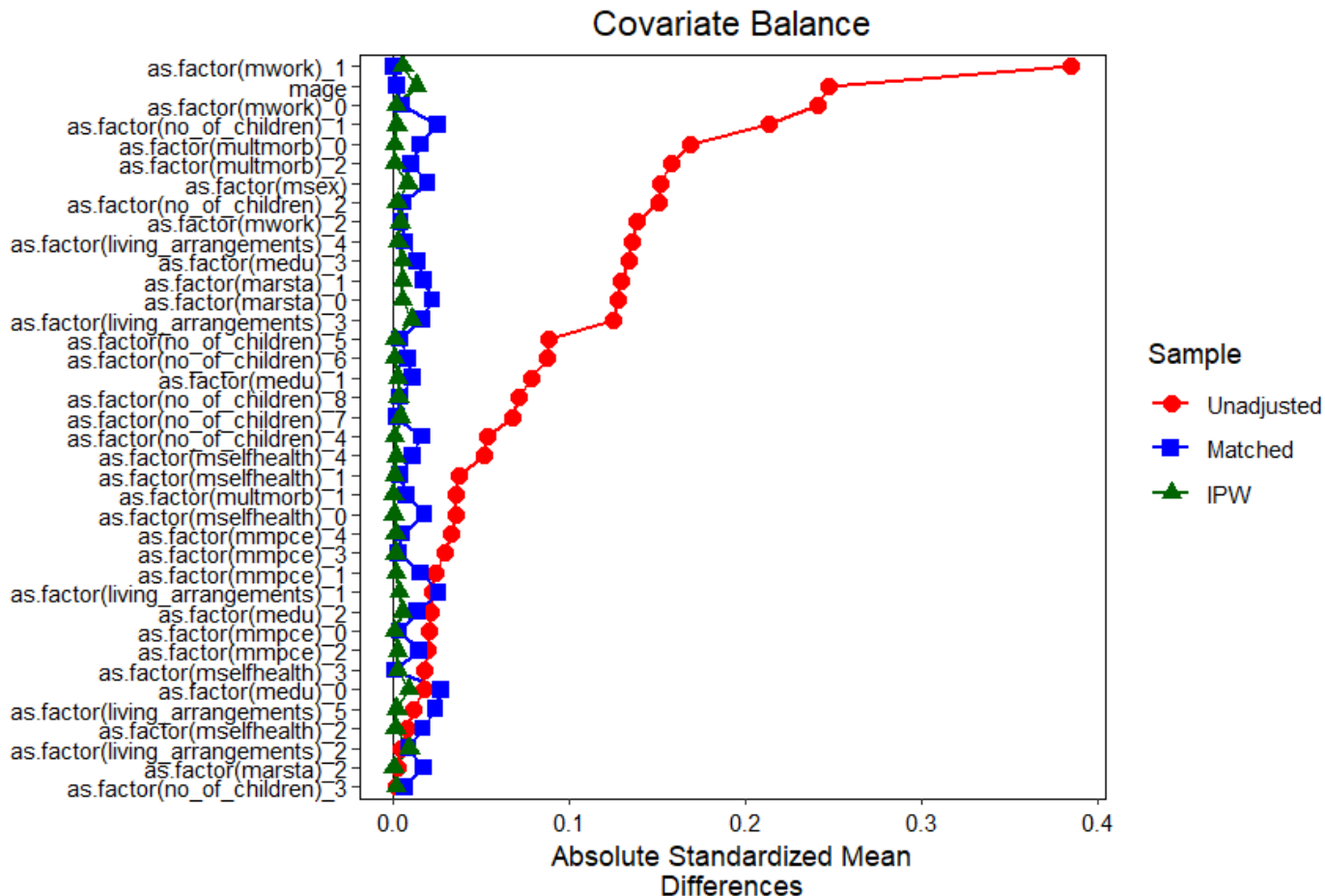


Fig A.7: Absolute standardised mean differences for covariates before and after matching



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