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DISCUSSION PAPER SERIES

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OCTOBER 2020

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ABSTRACT

From Parent to Child? The Long-Lasting Effects of Social Support*

Social bonds and supportive relationships (social support) are widely recognised as being indispensable to healthy psychological functioning and wellbeing. Applying a multilevel approach to the 2001-2016 Household, Income and Labour Dynamics in Australia (HILDA) data, we assess the impact of social support experienced by the parents during an individual's childhood on the individual's capacity to establish adequate social support in adult life. The level of social support experienced by the parents is measured during childhood/adolescence. Our findings show that, in addition to individual characteristics and other parental outcomes, the social support experienced by parents is an important predictor of the level of social support experienced by young adults. In particular, the mother's social support is an important predictor of the level of social support experienced by young female adults, while the father's social support is an important predictor of the level of social support experienced by young male adults. This evidence is further supported in an alternative specification based on sibling observations accounting for family fixed effects, finding that some individuals experience more social support when they are aged in their twenties than other individuals as a result of the family environment in childhood. In particular, social support experienced by parents explains about 16% of the initial family variance experienced by siblings.

JEL Classification: Z13, J13, D3

Keywords: social support, intergenerational transmission, multilevel analysis

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1. Introduction

Social bonds and supportive relationships (referred to as social support in this paper) are widely recognised as being indispensable to healthy psychological functioning and wellbeing. Indeed, social connections form a resource pool facilitating an individual's wellbeing (Amati *et al.*, 2018; Merz and Huxhold, 2010). These resources may include: access to useful information, company (e.g., personal and intimate relationships, someone to talk to, have dinner with, go on holidays with), emotional support (e.g., support when experiencing distressing personal or family matters), and instrumental support (e.g., financial support, household administration, home-making). More broadly, supportive relationships serve as buffers that diminish the negative consequences of stressful life events, such as bereavement, rape, job loss, and illness (Myers 2000).

In this paper, we focus on the level of social support as perceived to be available by the individual and we investigate the presence of intergenerational transmission of social support which we hypothesise to be mediated by the intergenerational transmission of the social competence needed to build supportive relationships.

Social support can be transmitted between generations through parental investment. Parents use resources and socialisation to produce social know-how and pro-social values in children which facilitate long-term social skills (e.g. Bourdieu, 1977, 1986). On the one hand, parents perceiving social support as being available are people who are able to build supportive relationships, and this ability can be transmitted from parents to children through the children's emulation of their parents' social competence. On the other hand, the social support experienced by the parents can facilitate access to other resources determining children's social skills. In particular, parents who feel supported by their social networks are more likely to engage in positive parenting practices that are likely to positively impact on children's social competence (e.g. Taylor *et al.*, 2015). As a result, parents transfer values, perceptions of ethics, morals and an understanding of the implicit "rules of the game"

to children thus shaping their social competence, which facilitates the development of supportive relationships in adulthood (e.g. Weiss, 2012).

We contribute to the existing literature using the 2001-2016 Household, Income and Labour Dynamics in Australia (HILDA) data which is particularly suitable for the proposed analysis as it contains measures from which perceived social support can be constructed. Where other studies have had to use measurements for parent and child that are close in time (e.g. Weiss, 2012; Lavenda and Kestler-Peleg, 2018), the HILDA data allow for a longer time-period between measurement of parental social support and measurement of the child's social support in young adulthood. Parental social support is as perceived and reported by the parent, while child social support is as perceived and reported by the child, which avoids correlation in the answers due to the same person reporting the social support for the parent and the child (e.g. Lavenda and Kestler-Peleg, 2018). We apply a multilevel approach to assess the impact of social support experienced by the parents in an individual's childhood on the individual's subsequent capacity to establish adequate social support in adulthood. The level of social support as perceived by the parents is measured when children are aged 15 years or less. We find that, over and above individual characteristics and other parental characteristics, social support as experienced by the parents is an important predictor of the level of social support experienced by young adults. In particular, the mother's social support is an important predictor of the level of social support experienced by young female adults, while the father's social support is an important predictor of the level of social support experienced by young male adults. Selecting a sample of individuals with at least one other sibling in the data and accounting for family fixed effects, we confirm this evidence, finding that some individuals experience more social support in their twenties than other individuals as a result of the family environment in childhood. In particular, the social support experienced by the parents explains about 16% of the initial family variance experienced by siblings.

The remainder of the paper is organised as follows. In Section 2, the literature is reviewed and the empirical strategy is presented in Section 3. In Section 4, we introduce the dataset and variables of interest. Section 5 reports and discusses the results, and Section 6 concludes.

2. Literature review

An extensive literature in economics and sociology going back many years has investigated the importance of family background on children's educational and socioeconomic success. More recent literature has also studied the role of family background on children's values and pro-social behaviours. The majority of these studies focus on the effect of parents on children's outcomes and are, therefore, based on models of intergenerational transmission between two generations.¹

In economics, the human capital model proposes that, in addition to transmitting innate genetic endowments to children, parents also actively invest resources to foster specific skills in their children (e.g. Becker and Tomes, 1986; Goldberger, 1989). The main idea is that parents use economic and other resources to produce human capital in children which facilitates long-term success. Thus, lifetime earnings can be transmitted between generations through parental investments. In Becker and Tomes (1979), intergenerational transmission is the result of parents caring about the lifetime earnings of their children and maximising utility by choosing between their own consumption and investment in their children's earning capacity. Solon (1999), Björklund, Jäntti and Lindquist (2009), and Black and Devereux (2011) review the progress of economists in this field, describing various angles from which one can study the importance of intergenerational transmission in earnings.

Theories in sociology have emphasised that, in addition to economic resources, parents use other, non-monetary resources to promote children's success (e.g. Bourdieu, 1977, 1986; Coleman, 1990). According to Bourdieu, non-monetary resources include cultural capital (which refers to familiarity

¹ Some authors have also included the role of the extended family, and especially grandparents, in children's lives using a three-generation approach (e.g. Bengtson, 2001; Mare, 2011, Pfeffer, 2014; Solon, 2018; Møllegaard and Jæger, 2015)

with dominant cultural codes and the ability to exploit this familiarity) and social capital (which refers to the scope and the quality of social networks that can be used to promote one's interests). Cultural capital is transmitted from parents to children through socialisation: it contributes to children's success by equipping children with an understanding of the implicit "rules of the game". Social capital can promote children's success if parents possess social connections that facilitate access to other resources determining children's success. Thus, children's success is related to children's access to parental social connections and their own ability of building social connections.

The aim of this study is to test parents' ability to transmit the skill of building social connections to their children; i.e. the transmission of social skills and pro-social behaviours from parents to children (as posited by Thompson, 2006). Previous literature has suggested that parents transfer skills and behaviours to children through cognitive representations of positive, stable, and confident relationships (Bowlby, 1969; Pullataz *et al.*, 1998).² Lavenda and Kestler-Peleg (2018) find that the mother's sociability (defined as perceived social support) is positively associated with their pre-school child's sociability. Parents can also transfer social skills and pro-social behaviours by transferring values, perceptions of ethics and morals to children. Jodl *et al.* (2001) show that the value placed on academic performance and sports are transmitted from parents to children. Hart and Fegley (1995) show that caring and ethically conscientious individuals possess selves that are closely tied to parental expectations. White and Matawie (2004) show that parents play an important role in their children's moral thinking.

Weiss (2012) focusses on knowledge of social know-how and pro-social values as a mechanism of intergenerational transmission of social capital networks. He points out that children are likely to emulate the pro-social behaviour displayed by their parents and build on what they have learned early

² Children construct expectations on how relationships should be through their early experiences with their parents; these experience-based expectations are believed to be incorporated into the personality structure and to influence behaviour in interpersonal relationships throughout and beyond childhood (Lerner and Steinberg, 2009). Anti-social behaviours can also be transmitted intergenerationally (e.g. Capaldi *et al.*, 2003; Serbin and Karp, 2004; Shaffer, Yates and Egeland, 2009).

in their development. The empirical findings confirm the importance of parental social capital networks as a predictor of adolescent social capital. Moreover, when parents feel supported by their social networks, they are more likely to engage in positive parenting practices (e.g. warmth, monitoring and supportiveness) that, ultimately, can also affect children's social competence positively (Taylor *et al.*, 2015).

However, children should not just be viewed as sponges passively absorbing parental values and pro-social behaviours (Weiss, 2012). Rather, intergenerational transmission of values is contingent on the acceptance of parental values by the children (Padilla-Walker, 2007). Other researchers have shown that the transmission of values and pro-social behaviours also depends on other parental characteristics that act as mediators in the transmission. Pratt *et al.* (2003) show that households with authoritative parenting display greater agreement on social values between parents and children than families with less strict discipline. Lavenda and Kestler-Peleg (2018) show the mediating effect of maternal competence (defined as the extent to which a mother feels confident and capable of caring for her children) in the intergenerational transmission of sociability (perceived social support). Parents' ability to transmit pro-social values and skills is also mediated through the closeness of the relationship between parents and children: if parents find it difficult to maintain a good relationship with their children, it decreases the ability of their children to form social networks (Weiss, 2012). In line with this view, parenting stress can disrupt the relationship between parents and children, negatively impacting on the transmission of values and pro-social behaviours.

The above studies about intergenerational transmission of social capital networks, social skills and pro-social behaviours have several limitations. In our view, the main limitation is the short time between the measurement of parental social networks and the measurement of the children's social competence. This reduces these studies' ability to identify the extent of intergenerational transmission, and makes it impossible to investigate whether early intergenerational transmission mechanisms for social competence development are related to social skills in later (independent) life.

This study overcomes this limitation by allowing a substantial amount of time (13 years) between the measurement of the parents' sociability (perceived social support) and the children's social competence. This enables us to analyse the long-lasting effects of parental outcomes on the individual capacity of developing adequate social support later on in life.

3. Empirical strategy

In this section, we present our empirical strategy for estimating whether social support experienced by the parents is a determinant of young adults' social support. The dual goal of our analysis is first to assess the role of parental social support in childhood/adolescence as a determinant of the level of social support experienced by young adults. Second, we wish to control for individual and parental characteristics that impact on the level of social support as perceived by young adults. The first goal requires having data on social support experienced by the parents in childhood/adolescence (see Section 4 for a detailed discussion). The second goal requires the use of a multilevel modelling technique. Multilevel models with random effects explicitly take into account the hierarchical structure of the data, thereby allowing us to analyse — first to measure, then to explain — the proportion of explained variation in the child's social support attached to each (nested) level.

The arguments for using multilevel models to analyse hierarchical data are well known (Skrondal and Rabe-Hesketh, 2004; Snijders and Bosker, 1999; Goldstein, 1995; Hox, 1995). When units are clustered, classical regression analyses are not appropriate since the underlying hypothesis of independence of observations is violated. As a result of this dependency, estimated standard errors are likely to be biased downwards and, hence, inferences about the effects of the covariates are not correct, leading to spuriously significant results (Hox, 1995). A simple solution would be to use robust methods to estimate corrected standard errors. However, when a multilevel structure also provides an interesting additional dimension to the analysis, the use of a multilevel model may be more appropriate and insightful (Arpino and Aassve, 2007). Multilevel models with random effects permit inclusion of time-invariant variables, while in the fixed-effects model these variables are absorbed by

the intercept so the role of such variables cannot be estimated.³ This is particularly relevant in our study since several variables of interest, and specifically the social support experienced by the parents, are mostly time-invariant variables.

3.1 Two-level model with random intercept

We initially estimate a simple two-level model with random effects in the form of random intercepts where observations are nested within individuals (level-1 observations over time, level-2 individuals).

The model can be written as

$$y_{ijt} = \beta_1 X_{ijt} + \gamma_0 s_{ij}^P + \beta_2 W_{ij} + a_{ij} + \varepsilon_{ijt} \quad (1)$$

where y_{ijt} is the social support perceived by young adult i in family j at time t , the vector X_{ijt} includes explanatory variables at the individual level, s_{ij}^P is our measure of the social support experienced by the parents during the individual's childhood/adolescence, the vector W_{ij} includes explanatory variables related to other parental characteristics and ε_{ijt} is the usual error term (assumed to have a mean of zero and a variance to be estimated). In this model, we assume that each individual has a different intercept coefficient, a_{ij} . Since the latter is a random variable that varies across individuals, it is often referred to as a random coefficient. In general, an individual with a high intercept is predicted to have more social support than an individual with a low value for the intercept.

The amount of dependence can be expressed as a correlation coefficient: the intra-class correlation coefficient (ICC). It represents the proportion of variance in the outcome variable that is explained by the grouping structure of the hierarchical model. It is calculated as the ratio of group level error variance over the total error variance:

$$ICC = \frac{\sigma_a^2}{\sigma_a^2 + \sigma_\varepsilon^2} \quad (2)$$

³ Random-effects models assume that the individual-specific effects are uncorrelated with the independent variables.

where σ_a^2 is the variance of the level-2 residuals a_{ij} (between variance) and σ_ε^2 is the variance of the level-1 residuals ε_{ijt} (within variance). In other words, the ICC represents the amount of variation that is not explained by any predictors in the model and that can be attributed to the grouping variable as a proportion of the overall unexplained variance (within and between variance).

3.2 Siblings and the three-level model with random intercepts

Research on sibling correlations in outcomes is well established in economics and sociology (see the reviews in Griliches, 1979; Solon, 1999; Björklund, Jäntti and Lindquist, 2009; and Black and Devereux, 2011). Siblings are “[M]ore alike than a randomly selected pair of individuals on a variety of socioeconomic measurements” (Griliches, 1979; p. S38); the idea is that sibling correlations of outcomes capture to some degree the family background influences that siblings share (e.g. factors passed from parents to children). However, sibling effects also capture those influences that are shared by siblings but that do not come from the parents, such as school effects, friendship networks, and other influences operating at the community level. Conversely, there may be family-transmitted factors that are not shared by siblings, (e.g., because of differential treatment from parents) and which are therefore not captured by sibling correlations. In the prototypical model of sibling outcome correlations, outcomes depend on both an individual-specific factor capturing components that are not shared between siblings, and a family-specific factor (sibling correlation) absorbing all determinants of outcome that are shared by siblings (Solon, 1999). This adds a third level to our model: family.

For assessing the role of social support experienced by the parents in shaping sibling correlations, we follow the approach proposed by Mazumder (2008) who estimates the correlation before and after conditioning sibling outcomes on family attributes in a multilevel model framework (level-1

observations over time, level-2 individuals and level-3 families).⁴ Following Mazumder (2008), outcomes are modelled as:

$$y_{ijt} = \beta Z_{ijt} + v_{ijt} \quad (3)$$

where the vector, Z_{ijt} , contains age and year dummies to account for lifecycle effects and year effects such as business cycle conditions. Age and year are treated as fixed effects variables at the individual and overall level respectively. The residual, v_{ijt} , which is purged of these effects, is then decomposed as follows:

$$v_{ijt} = f_j + a_{ij} + \varepsilon_{ijt} \quad (4)$$

where the three terms on the righthand side are treated as random effects that are assumed to be independent of each other. The first term, f_j , is the permanent component that is common to all siblings in family j . The second term, a_{ij} , is the permanent component that is individual-specific. ε_{ijt} represents the transitory component that reflects noise due to either temporary shocks to outcome or measurement error in the survey. The variance of age-adjusted outcome, v_{ijt} , then is simply $\sigma_v^2 = \sigma_f^2 + \sigma_a^2 + \sigma_\varepsilon^2$.

The first term, σ_f^2 , captures the variance in outcomes between families, whereas the second term, σ_a^2 , captures the variance in outcomes that is due to differences within families. These two components are then used to calculate the correlation in outcomes between siblings, ρ , which is

$$\rho = \sigma_f^2 / (\sigma_a^2 + \sigma_f^2) \quad (5)$$

⁴ Alternatively, the role of parental outcomes in children's outcomes can be characterised by modelling the child outcome as a linear function of the parental outcome, see e.g. Corcoran *et al.* (1990), Björklund *et al.* (2002), and Björklund, Lindahl and Lindquist (2010). The approach used by Mazumder (2008), when family attributes are limited to parental outcomes, is similar to the models used by Corcoran *et al.* (1990) and Björklund, Lindahl and Lindquist (2010), with the one difference that Mazumder's models are estimated via restricted maximum likelihood, assuming that unobserved outcome components are normally distributed, rather than through an Analysis of Variance (ANOVA) approach as used in Björklund *et al.* (2002) and Corcoran *et al.* (1990) or a weighted least squares regression as used in Björklund, Lindahl and Lindquist (2010).

To understand how different observable characteristics (e.g., parental outcomes) influence the sibling correlation in outcomes, Mazumder (2008) estimates the contribution of these factors. He adds the relevant variables to the vector Z (in Eq. 3) and treats them as additional fixed effects. The inclusion of these additional fixed effects should absorb some of the residual variation in the outcome variable and produce lower estimates of the family component variance (σ_f^{2*}) than what was found without their inclusion (σ_f^2). The reduction in the variance of the family component ($\sigma_f^2 - \sigma_f^{2*}$) can be interpreted as an estimate of the amount of the overall variance of the family component that can be attributed to the additional specific factor(s) that are included.

4. Data and main variables

We use the 2001-2016 Household, Income and Labour Dynamics in Australia (HILDA) data. The HILDA survey has been conducted annually since 2001 and is a household-based panel study that collects information about economic and personal wellbeing, labour market dynamics and family life. It aims to tell the stories of a representative group of Australians over the course of their lives.

Our sample includes all individuals who are aged 8 to 15 in the first wave (2001). We extract information about their parents during childhood/ adolescence (from 2001 to 2003). We then use observations on these individuals from later waves in the survey to analyse the long-lasting effects of parental outcomes on the individual's capacity of constructing adequate social support networks. In particular, we observe the individuals after 13 years. The resulting sample includes 1109 young adults aged 21 to 28; among them are 609 siblings (from 279 families). Weights are used as appropriate.

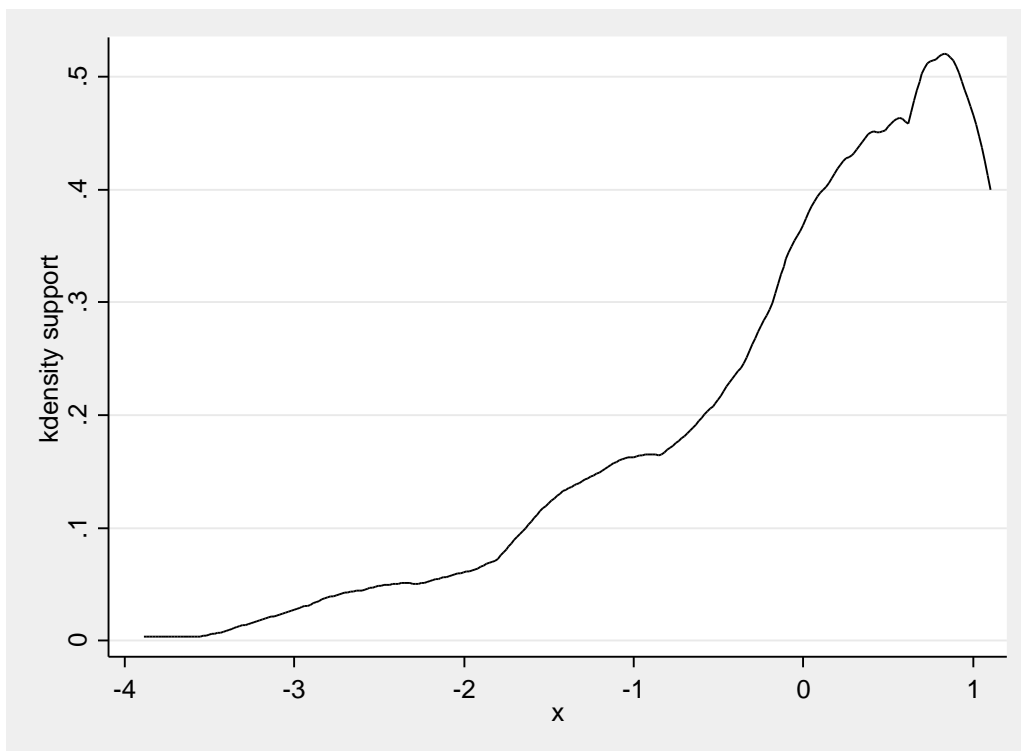
4.1 Measuring social support

In this study, both the dependent variable (young adult's social support) and the main independent variable (parents' social support) are derived from the answers to a set of five questions about the individual's perception of social support (on a 1–7 scale, representing responses of strongly agreeing to strongly disagreeing with the statement). In particular, the HILDA survey asks individuals whether they often need help from other people but cannot get it; whether they have anyone that they can

confide in; whether they have people to lean on in times of trouble; whether they often feel very lonely; and whether, when they need someone to help out, they can usually find someone. Taken together, these questions provide information about how much support an individual receives / expects to receive from other people. This information is used to construct a single aggregate indicator of perceived social support by an individual for inclusion in our analysis. We use exploratory factor analysis as a dimension-reducing strategy to produce this indicator (which is assumed to be a cardinal variable).⁵ See Appendix 1 for details.

Figure 1 shows the kernel estimates of the social support density function for our sample of young adults in 2014. The mean and the standard deviation are equal to zero and one, respectively, by construction.

Figure 1. Kernel density estimate of young adults' social support (year=2014)



⁵ We feel justified in making this assumption given the findings of Ferrer-i-Carbonell and Frijters (2004), widely followed in the economics of wellbeing literature, which show that assuming ordinality or cardinality of subjective perception makes little difference. See also Poggi (2010) and Anand and Poggi (2018).

4.2 Parental outcomes

To account for attributes of parents, we control for their level of social support, education level⁶, financial difficulties and parenting stress. The social support experienced by the parents is computed as an average over a three-year period (2001-2003).⁷ It averages the mother's and the father's social capital if both parents are present.⁸ Parental financial difficulty is represented by a dummy equal to one if the parents reported not paying utility bills on time, not paying the mortgage/rent on time or going without meals in at least one of the three years considered in the analysis (2001-2003).⁹

Research on socialisation argues that the intergenerational transmission of values is mediated by the closeness between parents and children (Weiss, 2012). Parenting stress can negatively affect the relationship between parents and children. Therefore, we construct an indicator to measure parenting stress drawing on a set of four questions about raising children (on a 1-7 scale, again representing responses of strongly agreeing to strongly disagreeing with the statement). The HILDA survey asks parents whether: (i) they believe that being a parent is harder than they thought it would be, (ii) they often feel tired/worn out/ exhausted from meeting the needs of their children, (iii) whether they feel trapped by their responsibilities as a parent, and (iv) they find that taking care of their children is much more work than pleasure. We use exploratory factor analysis as a dimension-reducing strategy. See Appendix 1 for details. We identify one factor that we label parenting stress.

Figure 2 shows graphically the “raw” relationships between parents' outcomes and children's future level of social support. We find that parents' education and social support are positively associated with the future level of social support experienced by the children. Conversely, parents' financial

⁶ We define a dummy “high education” (higher than 12 years of education) equal to one if the education level is Technical and Further Education, Bachelors or Postgraduate.

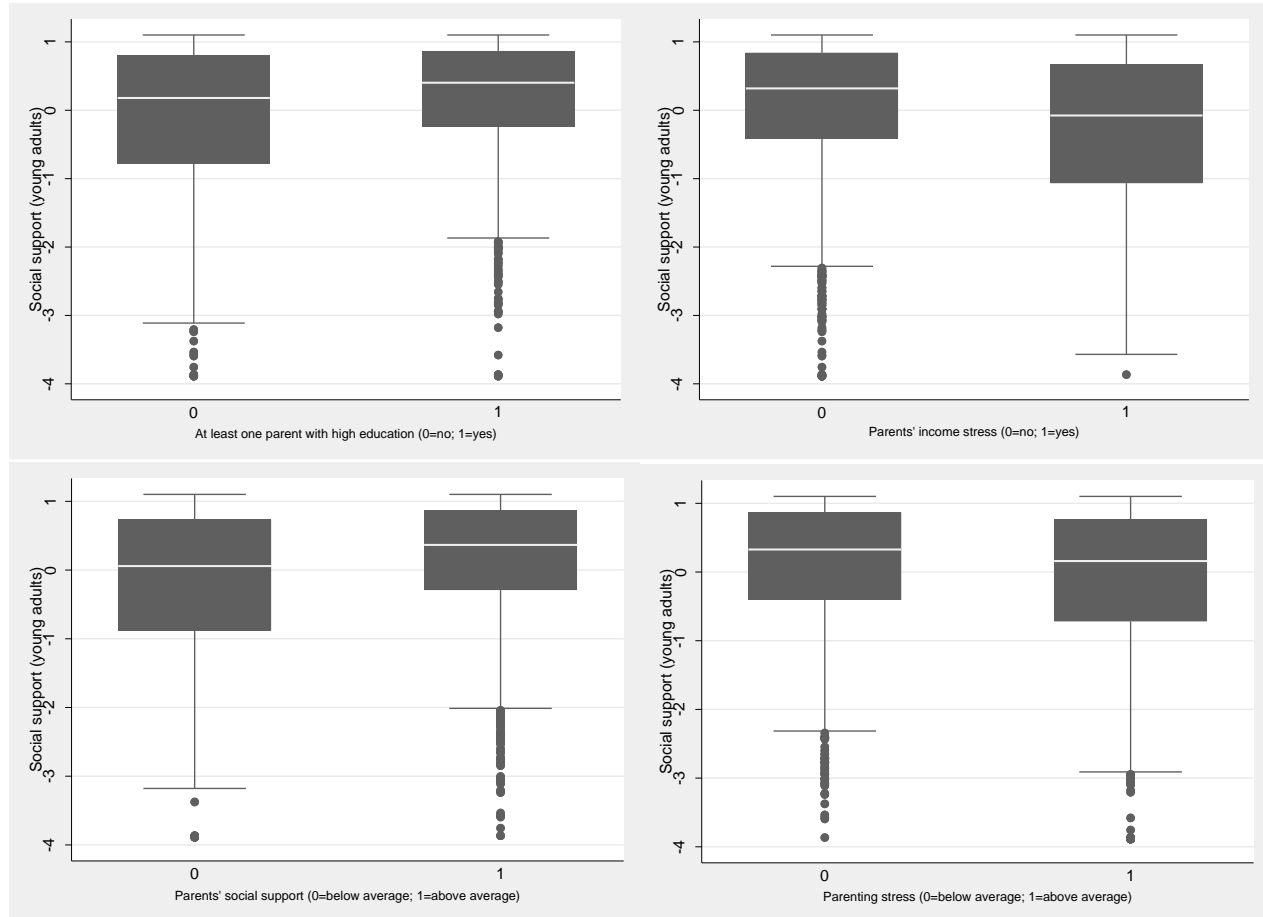
⁷ See Appendix 1 for details about the construction of the indicators.

⁸ We perform some robustness analysis using the level of social support experienced by the parent with the highest level of social support. Findings presented in this paper are robust to this alternative specification which does not change the relevant outcomes. The results of the robustness analysis are available upon request.

⁹ Difficulties in paying bills, mortgage/rent and meals need to be declared by both parents (if both parents are present in the household).

difficulties and parenting stress are negatively associated with the future level of social support experienced by the children. These results are investigated in depth in the next sections.

Figure 2. Social support experienced by young adults by parental attributes



4.3 Characteristics of young adults

To account for the individual characteristics of young adults, we control for their gender, age in years, education level¹⁰, employment status (student/employed/other), immigration status origin (at least one parent is not Australian born) and Aboriginal or Torres Strait Islander origin. We also control for being married or having a de facto partner, having children, and having financial difficulties. The latter indicator is a dummy equal to one if young adults reported not paying utility bills on time, not

¹⁰ We define a dummy “high education” (higher than 12 years of education) equal to one if the education level is Technical and Further Education, Bachelors or Postgraduate

paying the mortgage/rent on time, or going without meals. Dummies at the regional level are included to control for regional heterogeneity. Descriptive statistics are reported in Tables 1 and 2.

Table 1. Young adults: descriptive statistics (period: 2014-2016)

Young Adults (period: 2014-2016)	%
Female	51.36
Age is 21 (in 2014)	13.14
Age is 22 (in 2014)	12.68
Age is 23 (in 2014)	15.97
Age is 24 (in 2014)	11.83
Age is 25 (in 2014)	13.71
Age is 26 (in 2014)	12.46
Age is 27 (in 2014)	12.05
Age is 28 (in 2014)	8.16
Personality type is resilient	35.03
Personality type is over-controlled	28.62
Personality type is under-controlled	36.35
Aboriginal or Torres Strait Islander origin	2.79
At least one parent not Australian born	5.79
Region is Greater Sydney	16.88
Region is Rest of NSW	12.25
Region is Greater Melbourne	20.35
Region is Rest of Victoria	5.18
Region is Greater Brisbane	10.72
Region is Rest of Qld	8.5
Region is Greater Adelaide	7.49
Region is Rest of SA	1.21
Region is Greater Perth	8.82
Region is Rest of WA	1.65
Region is Tasmania	3.12
Region is Northern Territory	1.03
Region is Australian Capital Territory	2.8
<i>Parents' attributes (2001-2003)</i>	
Social support (mean)	0.00
At least one parent with high education (%)	33.79
Financial difficulties (%)	20.57
Parenting stress (mean)	0.00

Table 2. Descriptive statistics: time-varying variables

Young Adults	2014	2015	2016
High education (%)	24.39	29.39	32.35
Living with parents (%)	36.95	30.50	27.27
Living in consensual union (%)	36.30	40.45	43.66
Having children (%)	16.77	19.31	22.87
Student (%)	31.29	26.94	21.55
Employed (%)	76.70	79.69	80.89
Financial difficulties (%)	18.11	17.87	17.13

We also control for personality type. Personality, until recently a source of unobserved variation for economists, has been conceptualised as traits or stable individual differential characteristics explaining an individual's disposition to particular patterns of behaviour, cognition and emotion (Hogan, Hogan and Roberts, 1996). This area of psychology is dominated by a five-dimensional model of personality comprised of emotional stability, extraversion, conscientiousness, openness to experiences and agreeableness, labelled the “Big Five” (Goldberg, 1990), which provides a natural starting point for determining individual personality traits.

The dimensionality of the Big Five has been found to generalise across most cultures (McCrae and Costa, 1997; Pulver *et al.*, 1995; Salgado, 1997) and remains fairly stable over time in adulthood (Costa and McCrae, 1992; 1988). Conscientiousness is manifested in three related domains: achievement orientation (hardworking and persistent), dependability (responsible and careful), and orderliness (planning-oriented and organised). Thus, conscientiousness is related to an individual's degree of self-control, as well as the need for achievement, order and persistence. Openness to experience is characterised by ‘intellectance’ (original, innovative, willing to take risks and flexible) and unconventionality (imaginative, autonomous, and non-conforming). Persons open to experience are seen as original, innovative, willing to take risks and flexible. Agreeable persons are cooperative (trusting of others and caring) as well as likeable (good-natured, cheerful and gentle). As discussed in Anand and Poggi (2018), evidence is available that shows the existence of a relationship between personality traits and individual social capital. In particular, extraversion is related to the amount of

available social capital (Brown, 1996; Kanfer and Tanaka, 1993; Pollet, Roberts and Dunbar, 2011; Russell *et al.*, 1997; Swickert *et al.*, 2002). There is also evidence that emotionally stable individuals are likely to have more extensive networks because they are better capable of adapting to interpersonal differences (Klein *et al.*, 2004; Wu, Foo and Turban, 2008). Given their interaction with a wider variety of people, individuals who are open to experience are also likely to end up with more social capital (Wu, Foo and Turban, 2008).

The 2013 HILDA data reports scores for the Big Five (based on responses to the 36 personality questions) and we assume that personality traits are stable over the period of study.¹¹ Using cluster analysis (k-means non-hierarchical method), we identify three gender-indifferent personality types. We differentiate between personality types described as resilient, over-controlled, and under-controlled. Figure 3 shows the average deviations from the average value for each of the Big Five dimensions by these three personality types.¹² This classification is based on Block and Block's proposal (1980), which focussed, in one dimension, on ego resiliency (the degree of an individual's flexibility and adaptation towards the demands of the environment) and, in another dimension, on ego control (the intensity with which impulses and wishes are expressed – measured along an axis that has self-discipline at one end and impulsivity / explosive behaviour at the other end).

The specific typology for the resilient personality is indicated by scores above the average for all the Big-Five dimensions. The typology for the over-controlled personality involves below average scores for openness to experience combined with above average scores for emotional stability, with the other dimensions being less relevant for describing this type. The profile of the under-controlled personality type is characterised by low emotional stability and conscientiousness in combination with above-average levels of openness to experience.

¹¹ Using HILDA data and a sample of working-age adults, Cobb-Clark and Schurer (2012) demonstrate that personality (as measured by the Big Five) is stable over a four-year period.

¹² Our personality types are consistent with findings from research studies of personality typology based on the Big-Five model such as Asendorpf and Van Aken (1999), de Fruyt, Mervielde, and van Leeuwen (2002), Robins *et al.* (1996) and Sava and Popa (2011). See Herzberg and Roth (2006) for a review.

Figure 3. Prototype for the three identified personality types

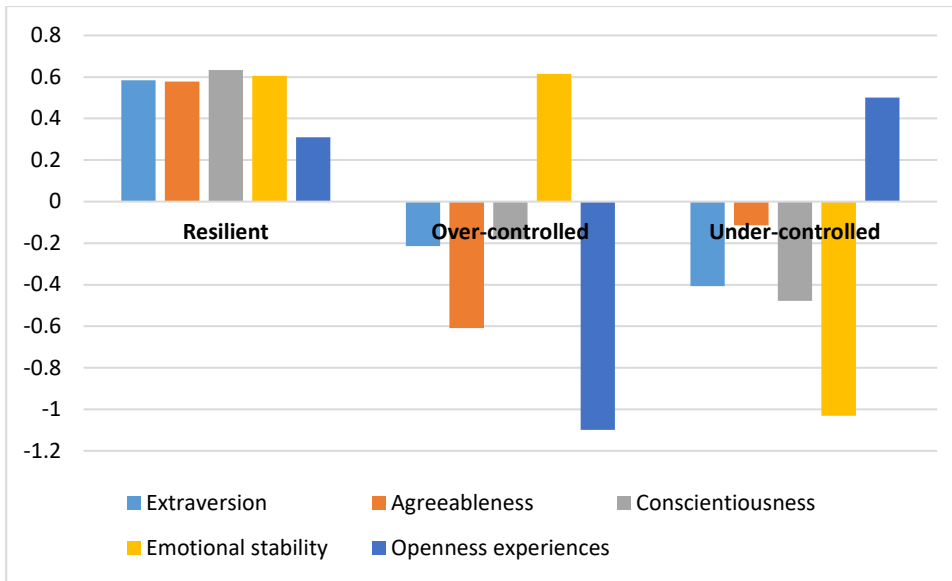
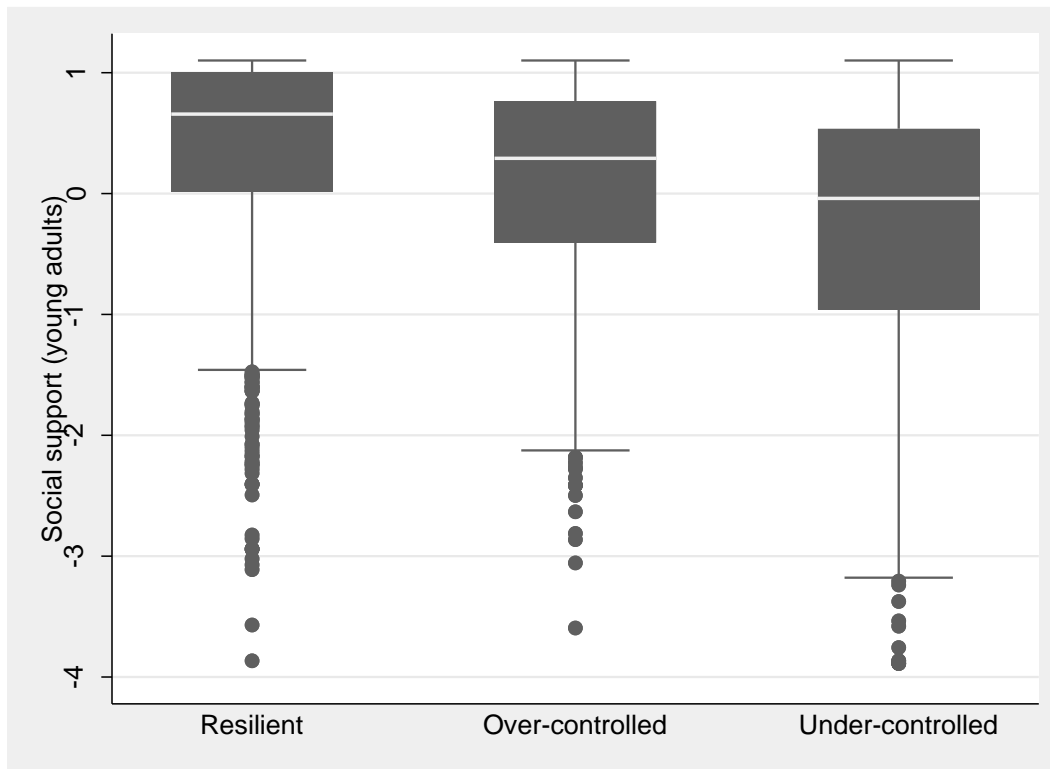


Figure 4 shows the relationships between personality types and social support. We find that resilient individuals have the benefit of higher social support than other individuals, while under-controlled individuals experience the lowest level of social support. This preliminary evidence confirms the idea that emotionally stable individuals may have more extensive networks, and therefore they may have the benefit of more social support than others. The trait of extraversion combined with emotional stability (as is more likely to be found in resilient individuals) may enable individuals to build a larger network of social contacts, and therefore increase their pool of available social support.

Figure 4. Young adults' social support by personality type



5. Main empirical results

In this section, we provide the main results of our models for young adults' social support including social support experienced by the parents during the young adult's childhood as one of the explanatory variables. As explained in Section 2, we use multilevel models to examine the effect of individual- and family-level characteristics on young adults' social support.

First, we estimate a model containing parental and individual demographic information, as well as measures of family affluence, financial difficulty and parenting stress, while controlling for personality type. Second, we investigate the role of the mother's social support and the father's social support separately. Third, we focus on siblings to further assess the impact of family-specific factors on young adults' social support.

5.1 Parental social support as a predictor of children's social support

Table 3 presents results for the two-level models explaining young adults' social support; a baseline model is extended by adding individual controls for personality type. The extended specification is the preferred specification on the basis of a log-likelihood ratio test. However, key estimates are similar across specifications.

Parental attributes in childhood/adolescence are important predictors of the level of social support experienced by young adults as hypothesised and discussed in section 2. This confirms the preliminary (descriptive) evidence presented in Section 4. The coefficient on social support experienced by the parents is positive and highly statistically significant. It implies that there is substantial correlation between social support experienced by the parents while the child is growing up and the level of social support experienced by the child when they are in their twenties. This result supports the idea that children emulate (pro-social) behaviour displayed by their parents and build on what they learned early on throughout their development.

The level of social support experienced by young adults is negatively correlated with parenting stress, which indicates that parenting stress may act as a barrier in the intergenerational transmission of behaviour and values. In other words, parenting stress may reduce the closeness between parents and children, negatively affecting the emulation of pro-social behaviour displayed by parents. We checked the interaction between parenting stress and the level of social support for the parents, but this did not work due to the small cell sizes for some combinations, so we could not confirm this pathway. The level of parental financial difficulties also significantly reduces the level of social support experienced by young adults. Parental financial difficulties could reduce parent-child activities as well as participation in (costly) social events; it could also increase parental stress reducing closeness between parents and children; and/or lead to lower social support for the young adult in childhood/adolescence. The coefficient of parents' education is not significant once we control for personality type and young adults' education.

Table 3. Two-level model (random effects): period of study: 2014-2016

Dependent variable is social support	Basic specification		With personality type	
	Coef	SE	Coef	SE
<i>Individual attributes</i>				
Female	0.118 **	0.051	0.083	0.051
age dummies	yes	yes	yes	Yes
high education	0.098 **	0.048	0.061	0.048
Personality type is resilient			0.541 ***	0.058
Personality type is over-controlled			0.316 ***	0.063
Personality type is under-controlled			ref.	
living with parents	0.008	0.038	-0.017	0.040
living in consensual union	0.209 ***	0.038	0.189 ***	0.040
having children	-0.122 **	0.052	-0.153 ***	0.054
Student	0.013	0.031	-0.004	0.033
Employed	0.125 ***	0.036	0.094 **	0.039
Financial difficulties	-0.200 ***	0.036	-0.199 ***	0.040
Aboriginal and Torres Strait Islander origin	-0.477 ***	0.141	-0.486 ***	0.137
At least one parent not Australia born	-0.078	0.092	-0.104	0.094
Greater Sydney	ref.		ref.	
Rest of NSW	-0.207 ***	0.077	-0.193 **	0.078
Greater Melbourne	-0.105	0.072	-0.075	0.073
Rest of Victoria	-0.026	0.103	-0.020	0.105
Greater Brisbane	-0.160 *	0.084	-0.232 ***	0.084
Rest of Qld	-0.288 ***	0.086	-0.284 ***	0.089
Greater Adelaide	-0.221 **	0.101	-0.287 ***	0.101
Rest of SA	-0.077	0.148	-0.212	0.164
Greater Perth	-0.136	0.098	-0.127	0.095
Rest of WA	-0.286	0.185	-0.358 *	0.201
Tasmania	-0.311 **	0.135	-0.233 *	0.135
Northern Territory	-0.172	0.192	-0.219	0.187
Australian Capital Territory	-0.114	0.120	-0.137	0.118
<i>Parents attributes (2001-2003)</i>				
social support (average)	0.176 **	0.03787	0.127 ***	0.038014
at least one parent with high education	0.109 *	0.056121	0.087	0.055325
Financial difficulties	-0.151 **	0.064196	-0.208 ***	0.065594
parenting stress (average)	-0.099 ***	0.035336	-0.078 **	0.035347
Year dummies	yes	yes	yes	yes
Constant	no	no	no	no
σ_a^2	0.589 ***	0.030	0.487 ***	0.027
ICC_individual	0.687		0.643	
log-likelihood	-3657.8		-3120.9	
No. Individuals	1109		968	
No. Observations	3327		2904	

Note: Variance at level 1 is 0.27; (***) significance level of 0.01; (**) significance level of 0.05; (*) significance level of 0.1.

Individual characteristics are also associated with the level of social support. We find a strongly significant correlation between personality type and social support: resilient individuals and over-controlled individuals experience higher social support than under-controlled individuals (the estimated coefficients are equal to 0.54 and 0.32, respectively). Observing the personality traits that define resilient individuals, such as extroversion and emotional stability, we interpret these results as indicating that these traits are particularly important for developing large social networks able to provide social support. Emotional stability is a personality trait characterising resilient and over-controlled individuals, so this positive result for both groups indicates that emotional stability is important. However, the larger correlation for resilient young adults indicates that extroversion is also relevant but only if combined with emotional stability.

We also find that highly educated individuals appear to experience more social support. Living in a consensual union also increases the level of social support experienced/perceived by individuals, while having children decreases the level of social support perceived by individuals. Young adults with an Indigenous background experience substantially and significantly lower social support than non-Indigenous young adults. However, the number of Indigenous individuals in the HILDA data is small, so caution should be used in drawing conclusions from this. There also appear to be regional differences, with Greater Sydney young adults experiencing the most social support, closely followed by Greater Melbourne and the rest of Victoria (outside the capital city), while young adults living in the rest of Western Australia, the rest of Queensland, greater Adelaide and Tasmania experience the lowest levels of social support. There are no clear patterns to this (e.g. capital city versus regional areas), but the rest of Western Australia and Queensland, and Tasmania have larger numbers of disadvantaged, low-income families than other parts of Australia. For as far as this is not already picked up through our explanatory variables, this may be absorbed by the geographic indicators.

Employed individuals have more perceived social support, probably because they benefit from larger networks through their job and they have more financial stability. Consistent with this argument,

financial difficulties constrain the development of social support networks. Moreover, individuals experiencing financial difficulties may desire/need more social support than what is available on average. Therefore, it is more likely that they have a perception of low (insufficient) support. Alternatively, through their higher need they may discover that the social support they believed they could count on is actually not available.

5.2 Mother's versus father's social support

In this section, we perform a robustness analysis estimating three additional two-level models for young adults' social support including social support experienced by the mother and the father separately. The focus is on young adults who grew up in two-parent households. Results are presented in Table 4. We are interested in whether mothers' and fathers' social behaviours equally contribute to children's social skills and, therefore, to the level of social support experienced later in life. Since the intergenerational transmission of values and behaviour could be mediated by parenting stress (as explained earlier), the specification also includes the mother's and father's parenting stress separately.

Our results suggest that the level of social support experienced by the mother during childhood/adolescence of the young adult is positively associated with the level of social support experienced by the young adult in their twenties, while the level of social support experienced by the father is not (Table 4, Columns 2 and 3). Consistently, only the mother's parenting stress negatively impacts on the level of future social support experienced by children. However, when considering young female and male adults separately, the results change considerably. The mother's experience of social support is positively associated with the level of social support experienced by young female adults (Table 4, Columns 4 and 5), while the father's experience of social support is positively associated with the level of social support experienced by young male adults (Table 4, Columns 6 and 7). These results suggest that the relevant transmission of behaviour is gender specific. The transmission of social support network building skills from mother to children is particularly relevant for young female adults, while transmission of social support network building skills from father to

children is particularly relevant for young male adults. In these results, parenting stress seems to be a relevant hurdle in the transmission of behaviour and values from mothers to children only.

Table 4. Young adults growing up in two-parent households: two-level model (period of study: 2014-2016)

Dependent variable is: social support	Everyone in sample		Females only		Males only	
	Coef	SE	Coef	SE	Coef	SE
Individual attributes						
Female	0.067	0.055	no	no	no	no
age dummies	yes	yes	yes	yes	yes	yes
Personality type is resilient	0.526 ***	0.063	0.525 ***	0.098	0.524 ***	0.083
Personality type is over-controlled	0.326 ***	0.070	0.246 **	0.097	0.388 ***	0.101
Personality type is under-controlled	ref.		ref.		ref.	
Individual covariates and area dummies	yes	yes	yes	yes	yes	yes
Parents attributes (2001-2003)						
father's social support	0.053	0.040	-0.033	0.060	0.107 ***	0.040
mother's social support	0.097 ***	0.035	0.163 ***	0.052	0.045	0.048
at least one parent with high education	0.061	0.059	-0.031	0.085	0.132	0.082
Financial difficulties	-0.169 **	0.086	-0.275 **	0.135	-0.152	0.113
father's parenting stress	-0.049	0.040	-0.042	0.059	-0.054	0.055
mother's parenting stress	-0.067 **	0.034	-0.101 **	0.046	-0.064	0.053
Year dummies	yes	yes	yes	yes	yes	yes
constant	no	no	no	no	no	no
σ_a^2	0.670 ***	0.021	0.650 ***	0.030	0.668 ***	0.029
ICC_individual	0.647 ***	0.018	0.644 ***	0.026	0.644 ***	0.024
Log likelihood	-2299.33		1021.06		1253.92	
No. Individuals	746		340		406	
No. Observations	2238		1020		1218	

Note: Variance at level 1 is 0.49; (***) significance level of 0.01; (**) significance level of 0.05; (*) significance level of 0.1

5.3 Siblings

In Table 5, we present estimates of the correlation between siblings before and after conditioning siblings' social support on family attributes. As explained in Section 3.2, we run a three-level model that can identify the proportion of variance in social support that is explained by the grouping structure of the hierarchical model with: level-1 observations, level-2 individuals, and level-3 family.

Before conditioning sibling social support on family attributes, we find that the estimates of the variances of both the random intercept for individuals (σ_a^2) and the random intercept for families (σ_f^2) are positive and statistically significant (Table 5, columns 2 and 3). The proportion of the total variation explained by the individual is equal to 57%, while the proportion of the total variation explained by the family is equal to 18%. This means that some individuals are more inclined to experience social support than other individuals due to the family they are born in. In fact, our estimate of the correlation in siblings' social support, ρ , is 0.24 (see Table 5, columns 2 and 3).

Inclusion of the parents' attributes reduces the variance of the random intercept for families and, consequently, the proportion of the total variation explained by the family (from 18.2% to 12.2%). Once we control for all four family attributes (social support experienced by the parents, parental education, financial difficulties, and parenting stress), the estimated sibling correlation also reduces from 0.24 (σ_f^2) to 0.17 (σ_f^{2*}) (see Table 5, columns 10 and 11). The family attributes mentioned above explain about 37% of the initial family variance ($(\sigma_f^2 - \sigma_f^{2*})/\sigma_f^2$). In particular, the social support experienced by the parents explains about 16% of the initial family variance (Table 5, columns 4 and 5); parents' financial difficulties explain a further 12% (Table 5, columns 6 and 7); parents' education explains a further 16% (Table 5, columns 8 and 9); and parenting stress explains a further 3% (Table 5, columns 10 and 11). These results confirm the evidence reported in section 5.1 about the importance of parents' attributes experienced in childhood/adolescence on the level of social support experienced by young adults in their twenties.

Table 5. Siblings: three-level mixed model (period of study: 2014-2016)

	No parental attributes		+ parental social support		+ parental financial difficulties		+ highly educated parent		+ parenting stress	
Dependent variable is social support	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Parents' attributes (2001-2003)										
social support (average)			0.232 *** 0.057		0.170 *** 0.059		0.171 *** 0.058		0.137 *** 0.052	
at least one parent with high education							0.199 *** 0.072		0.214 *** 0.082	
financial difficulties					-0.363 *** 0.107		-0.320 *** 0.107		-0.327 *** 0.107	
parenting stress (average)									-0.101 ** 0.046	
age and year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	Yes
σ_a^2	0.561 *** 0.050		0.563 *** 0.050		0.565 *** 0.051		0.567 *** 0.051		0.568 *** 0.051	
σ_f^2	0.178 *** 0.046		0.150 *** 0.044		0.129 *** 0.043		0.118 *** 0.043		0.113 *** 0.043	
ICC_individual	57.3%		59.0%		60.5%		61.3%		61.6%	
ICC_family	18.2%		15.7%		13.8%		12.7%		12.2%	
ρ	0.241		0.210		0.185		0.172		0.166	
% family variance explained by parental outcomes: $(\sigma_f^2 - \sigma_f^{2*})/\sigma_f^2$			16%		28%		34%		37%	
Log-likelihood	-1990.45		-1982.55		-1976.95		-1974.03		-1966.32	
No. Obs.	1827		1827		1827		1827		1827	
No. Individuals	609		609		609		609		609	
No. Families	279		279		279		279		279	

Note: Variance at level 1 is 0.24; (***) significance level of 0.01; (**) significance level of 0.05; (*) significance level of 0.1

6. Conclusions

Using the 2001-2016 Household, Income and Labour Dynamics in Australia (HILDA) data and a multilevel approach, we assess the impact of social support experienced by the parents on the individual's capacity to establish adequate social support in the future. We find the following results. *First*, there is substantial correlation between social support experienced by parents in the young adult's childhood/adolescence and the level of social support experienced by the young adult in their twenties, offering empirical support to the idea that children emulate the pro-social behaviour displayed by their parents. Focussing on siblings, we confirm the evidence that social support experienced by the parents is an important predictor of the level of social support experienced by young adults. We find that the social support experienced by the parents explains about 16% of the initial family variance. *Second*, we find that the level of social support experienced by young adults is negatively correlated with parenting stress and parental financial difficulties in childhood/adolescence suggesting that these factors may act as barriers in the intergenerational transmission of behaviour and values. *Third*, we find that transmission of social support from mother to child is particularly relevant for young female adults, while transmission of social support from father to child is particularly relevant for young male adults.

These findings have policy implications. It is well-known that financial difficulties of parents may have an impact on children's outcomes by restricting available resources for investing in children. However, the first two findings show that financial difficulties can also impact children's outcomes by reducing their ability to build a social support network, possibly due to a reduced social support network of their parents and through reduced transmission of the skills needed to build their own social support network. Therefore, in cases of prolonged financial stress, for example due to long-term unemployment, it may be useful to provide non-financial assistance to families in addition to income support. This could include ensuring parents and their children have access to social networks, and are referred to social and (mental) health services when needed. The third finding provides

evidence for the importance of continued contact of both parents with their children in case of divorce or separation. It is likely to be important for several reasons, but this paper has shown that one of these reasons may be to ensure boys and girls have a role model for building social support in adult life.

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Appendix 1. Variable construction using factor analysis

Factor analysis is a statistical data reduction technique used widely to explain variation among observed random variables through the use of fewer unobserved random variables called factors. In general, factor analysis specifies the observed variables as linear combinations of the factors, plus normally distributed error terms. The algorithm produces a factor structure matrix (called the factor loading matrix) representing the correlations between the variables and the factors. The interpretation of each factor is informed by high loadings on a certain sub-sample of (related) attributes that assist in labelling the specific type of unobservable.¹³ Each factor score has zero mean (and standard deviation of one) by construction.

First, we focus on the parents. Using factor analysis, we construct the indicators of social support and parenting stress. Factor analysis is performed separately for each year so that outcomes can be interpreted as deviations from yearly means (that are equal to zero by construction). Each year, we identify one factor, labelled social support (see Table A1) and one factor, labelled parenting stress (see Table A2). The Kaiser–Meyer–Olkin measures of sampling adequacy report values of about 0.7, confirming that the variables have enough in common for the factor analysis to be valid.

Second, we focus on young adults. Using factor analysis, we construct the indicators of social support. In each year, we identify one factor, labelled social support (see Table A3). The Kaiser–Meyer–Olkin measures of sampling adequacy report values of about 0.8, again confirming that the variables have enough in common for the factor analysis to be valid.

Table A1. Factor analysis: social support (parents)

Parents attributes:	Social support		
	2001	2002	2003
Issupnh - I often need help from other people but cannot get it	0.647	0.655	0.684
alssupac - I don't have anyone that I can confide in	0.790	0.805	0.823
Issuplt - I have no one to lean on in times of trouble	0.832	0.825	0.831
Issupvl - I often feel very lonely	0.694	0.734	0.712
Issupsh - When I need someone to help me out, I can usually find someone	-0.619	-0.654	-0.681
Explained proportion of total variance	0.52	0.55	0.56
Kaiser-Meyer-Olkin measure of sampling adequacy	0.76	0.78	0.79

Note: scale from 1 (strongly agree) to 7 (strongly disagree)

¹³ We retain only factors which account for sufficient variance: that is, unless a factor extracts at least as much as the equivalent of one original variable, we do not consider it (Kaiser criterion). Since factor analysis is based on a correlation matrix, it assumes that the observed variables are measured continuously, are distributed normally, and that the association between indicators is linear. Our observed variables are discrete, so we assume that they are indicators of underlying continuous unobserved variables and use the appropriate correlations in the factor analysis. If we retain more than one factor, we perform an oblique rotation, allowing factors to be correlated

Table A2. Factor analysis: parenting support

Parents' attributes:	Parenting stress		
	2001	2002	2003
pahard - Being a parent is harder than I thought it would be	0.716	0.748	0.728
patird - I often feel tired, worn out, or exhausted from meeting the needs of my children	0.772	0.794	0.792
patrap - I feel trapped by my responsibilities as a parent	0.778	0.778	0.791
pawork - I find that taking care of my child/children is much more work than pleasure	0.737	0.758	0.756
Explained proportion of total variance	0.56	0.59	0.59
Kaiser-Meyer-Olkin measure of sampling adequacy	0.71	0.74	0.75

Note: scale from 1 (strongly disagree) to 7 (strongly agree).

Table A3. Factor analysis: social support (young adults)

Young adults' attributes:	Social support		
	2014	2015	2016
Issupnh - I often need help from other people but cannot get it	0.777	0.797	0.822
alssupac - I don't have anyone that I can confide in	0.881	0.853	0.862
Issuplt - I have no one to lean on in times of trouble	0.880	0.869	0.872
Issupvl - I often feel very lonely	0.770	0.783	0.781
Issupsh - When I need someone to help me out, I can usually find someone	-0.790	-0.807	-0.790
Explained proportion of total variance	0.67	0.68	0.68
Kaiser-Meyer-Olkin measure of sampling adequacy	0.85	0.85	0.85

Note: scale from 1 (strongly agree) to 7 (strongly disagree).