Social and Emotional Wellbeing Among Young People; the Mitigating Role of Ecological Domains

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Abstract

To examine the role of neighbourhood, what Bronfenbrenner describes as an element in the exosystem, as a protective asset for adolescents' social and emotional wellbeing. The study used a subset of national data reported by adolescents and their parents from the Longitudinal Study of Australian Children (LSAC). A linear mixed-effect model was used to estimate the association between neighbourhood indicators and trajectories in a measure of social and emotional wellbeing (the SDQ Total Difficulties score) at ages 12–13, 14–15 and 16–17, controlling for age and sex, peer and family relationships and household material resources. The analysis revealed that parents' perceptions of belonging and their subjective assessments of the condition of housing in the neighbourhood, as well as externally sourced data on neighbourhood accessibility and socio-economic status, were significantly associated with adolescents' total difficulties scores over time. The findings revealed the role of neighbourhood level protective assets as a potential influence on adolescents' social and emotional wellbeing. Greater attention should be given to understanding the complex interactions between the resources mobilised by individuals and their families, and the influence of wider environments and social structures on young people's social and emotional wellbeing.

Keywords Adolescent · Protective assets · Exosystem · Neighbourhood · Social and emotional wellbeing · Longitudinal survey

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1 Introduction

Protective health assets as resources for the creation of health and wellbeing during the second decade of life have been given increasing attention, including as mitigating resources against poor health, as well as offering the potential to promote positive health, and social and emotional wellbeing (Benson et al., 2011; Morgan & Ziglio, 2007; Paakkari et al., 2019). Protective health assets are defined as any resource *that enhances the ability of individuals and communities to improve and sustain their health and wellbeing and reduce inequalities* (Atkins et al., 2002; Pérez-Wilson et al., 2013). An asset-based approach to adolescent health focuses on the potential and opportunity to foster adolescents' development within their primary ecological domains and in the context of their wider environments through identification of resources, relationships and other assets that promote positive health and protect against poor outcomes (Atkins et al., 2002; Leffert et al., 1998).

Health assets are social or relational and material resources at the individual, family, community and societal level that act to protect people's health and wellbeing. Although Morgan and Ziglio (2007) argue that health assets offer a means to reduce health inequalities within the communities, they have nonetheless been criticised for failing to engage with the issue of health inequalities (Friedli, 2013). This criticism comes from the identification of economic and social resources associated with an affluent lifestyle, especially at the individual and family levels, as health assets. However, identification of resources at the community or neighbourhood levels as health protecting assets offers one potential pathway towards countering this criticism (Elgar et al., 2015).

Research has adapted Bronfenbrenner's ecological model of child development (Bronfenbrenner & Morris, 2006) to explore the protective role of health assets. Cala and Soriano (2014) use Bronfenbrenner's model to explore the role of health assets located in young people's microsystems (the inner circle of Bronfenbrenner's ecological model) such as school, peers and family in protecting their mental health (Cala & Soriano, 2014). Similarly, microsystem level assets such as parenting styles characterised by warm and affective practices (Gonzales et al., 2011) and exposure to positive peers (Moriana et al., 2006) are known to positively predict adolescent mental health (broadly defined as low levels of emotional and behavioural issues). Peer and school support, and social relationships, are also found to act as protective health assets (Aspy et al., 2004; Atkins et al., 2002; Culyba et al., 2016). Evidence also suggests that participation in social activities in the community is a predictor of feelings of social cohesion and sense of belonging, with positive effects on a range of outcomes such as educational attainment (Benson & Scales, 2009; Morrow, 1999).

The relationship between community or neighbourhood characteristics located in what Bronfenbrenner terms as the *exosystem* and the mental health of adolescents has also received a degree of attention. Bronfenbrenner (1993, p. 24) defines the exosystem as comprising "the linkages and processes taking place between two or more settings, at least one of which does not contain the developing person, but in which events occur that indirectly influence processes within the immediate setting in which the developing person lives." The community or neighbourhood where a

young person lives is one such setting. Cala and Soriano (2014) argue that young people in the process of 'becoming' are often not actively involved in their exosystem but it does nonetheless exert an influence on their development. Kretzmann (1993) argues that factors such as the condition of the neighbourhood, available services, educational systems and social infrastructures in the neighbourhood have a significant influence on its members' sense of efficacy and relationships. Availability of, and accessibility to, community and neighbourhood resources are also shown to positively influence community members' health outcomes (Blickem et al., 2018; Brooks et al., 2012). For young people however, accessibility to resources in the neighbourhood may depend at least in part on the attitudes of parents, who may ultimately promote or restrain a young person's movement and social interactions through a neighbourhood. For example, Mitra et al. (2014) point to the influence of parental attitudes on their children's capacity to roam in their neighbourhoods. This may in turn influence associations between parental perceptions of neighbourhood and young people's social and emotional wellbeing, especially as they enter adolescence and begin to spend more independent time spent outside of the home and family structures, and within neighbourhood settings (Christensen & O'Brien, 2003).

Neighbourhoods, as key elements in Bronfenbrenner's exosystem, and as overarching domains of experience and interaction, can comprise supportive, empowering, positive and equalising developmental assets for adolescents (Hamilton et al., 2003; Morgan & Ziglio, 2007), and are important influences on their wellbeing. A systematic review of thirty recent studies on the relationship between neighbourhood factors and young people's mental health found indicators of neighbourhood social environment to be strongly associated with both internalising and especially externalising behavioural difficulties among young people (Visser et al., 2021). On the other hand, indicators of neighbourhood socio-economic status were not found to be strongly associated with young people's mental health outcomes. A number of analyses reviewed by Visser et al. (2021) used longitudinal data to examine trajectories in the relationship between neighbourhood and young people's mental health. Some focussed on earlier childhood years (Flouri et al., 2012; Humphrey & Root, 2017). Others examined effects of changes in neighbourhood factors (Brazil & Clark, 2017). Some focused specifically on effects of neighbourhood on depressive symptoms in adolescents (Barr, 2018; Brazil & Clark, 2017). Overall, findings from these papers were mixed. For example, Humphrey and Root (2017) found a direct relationship between neighbourhood and externalising behaviours at age 11, but not at age 7. On the other hand, Barr (2018) found that neighbourhood disadvantage had no effect on adolescents' depressive symptoms, while neighbourhood disorder (measured from parent, child and interviewer perceptions) was found to be associated with higher persistent levels of depressive symptoms.

Uniquely among the studies examined by Visser et al., Astell-Burt et al. (2012) examine the relationship between neighbourhood deprivation and trajectories of social and emotional wellbeing, measured by the Strengths and Difficulties Questionnaire (SDQ) Total Difficulties score, among a sample of UK adolescents aged 12–18, with a focus on variations among different ethnic groups. This paper found that neighbourhood deprivation was associated with higher SDQ scores, but only among white adolescents once experiences of racism (which were dominant for

other ethnic groups) were taken into account. However, the paper mainly focused on indicators of material deprivation, and did not examine the association between neighbourhood social factors and adolescents' social and emotional wellbeing.

The present study aimed to complement existing research by examining the role of both material and social resources at the level of the neighbourhood as protective health assets for young people's social and emotional wellbeing among a national sample of Australian adolescents. Bronfenbrenner's theory did not specifically outline what features of the exosystem will drive developmental outcomes. However, the model assumes that the environment will facilitate more proximal factors that shape the life course (Tudge et al., 2016). These indicators of protective factors in the neighbourhood are all argued to directly contribute to young people's day-to-day experiences. Understanding how neighbourhood-level social and material assets impact on young people's social and emotional wellbeing is worthy of further examination, as it shifts debates on health assets beyond those held by families and individuals, and towards more community level areas of policy action. Specifically, parental perceptions of neighbourhood facilities (for example, access to services), neighbourhood liveability (such as access to parks and recreation in the neighbourhood), belonging (feeling connected to other people in the neighbourhood), and the physical condition the neighbourhood were hypothesised as predictors of trajectories of social and emotional wellbeing among adolescents. Use of parental perceptions is consistent with research showing that parental attitudes towards their neighbourhood influences their children's capacity to explore their neighbourhoods (Mitra et al., 2014), with community facilities and trust providing opportunities for safe and fulfilling physical and social interactions needed for healthy development. To ensure these effects emerge over and above other determinants of health, socio-economic status and community remoteness were included as community level controls. We further controlled for other microsystem-level factors that are likely to predict adolescent social and emotional wellbeing including relationships with peers and parents, and household material resources.

The use of longitudinal data provides an opportunity to unpack important developmental processes. It is well established that average levels of social and emotional problems are low at the onset of adolescence, but increase steadily through to adulthood (O'Donnell et al., 2022). Although increases in mental ill-health symptomology are developmentally normative, environmental and neighbourhood level assets that stymie steep increases in young people's social and emotional problems reduce the likelihood of future clinical psychological disorders, illegal behaviours, and poorer educational outcomes during adulthood (Bevilacqua et al., 2018; Tejerina-Arreal et al., 2020) and, importantly, improve their current quality of life.

1.1 Study Aim

This paper examines the association between social and material factors at the level of the neighbourhood as protective health assets, and young people's social and emotional wellbeing, where neighbourhood-level factors include parental perceptions of both social and material resources in the neighbourhood and other external measures of neighbourhood material wellbeing, taking into account confounding

factors of parents' relationships with their adolescent children, adolescents' relationship with peers, and measures of household socio-economic status.

2 Data and Method

2.1 Data

This study utilised survey data from the Longitudinal Study of Australian Children (LSAC), which provides comprehensive information on the growth and development of Australian children (Edwards, 2014). The LSAC is a prospective study of child development comprising two cohorts, the K (kindergarten) cohort, born in 1999 and the B (birth) cohort born in 2003. Both cohorts comprised nationally representative samples of about 5,000 study children at Wave One. Parents (over 98% of them mothers) were interviewed every two years, with detailed questions on their children's development, as well as their social, economic and environmental contexts. As study children grew older, they too were able to participate in interviews of increasing length and complexity. Children in the K cohort, used in this analysis, were interviewed from age 6 (at Wave 2). Data used for this analysis were collected in 2012, 2014 and 2016, when the study children were aged about 12–13 (wave 5; $n = 3,956$), 14–15 (wave 6; $n = 3,537$), and 16–17 (wave 7; $n = 3,089$), respectively.

The project, funded by the Australian Research Council (DP190100247) received ethical approval from the Flinders University Human Research Ethics Committee (Approval No. 3819). Permission to access LSAC data was granted by the Australian Data Archive (ADA) on behalf of the data owner(s): Department of Social Services; Australian Institute of Family Studies, and Australian Bureau of Statistics. LSAC data are available for analysis by all bona fide researchers.

2.2 Measures

The derivation of all variables used in this analysis is described in more detail in the Appendix.

Dependent variable The outcome measure in this study was the study child-reported Strengths and Difficulties Questionnaire (SDQ) total difficulties score. The SDQ is a commonly used behavioural screening tool for adolescent mental health, and the SDQ Total Difficulties score has been separately validated as an indicator of clinical mental distress (Goodman et al., 1998). As noted above, this measure was used by Astell-Burt et al. (2012) in their study of neighbourhood, racism and psychological wellbeing. The total difficulties score as implemented in the LSAC had a high reliability coefficient (Cronbach Alpha $\alpha = 0.995$ among the 12–13 year old sample), and ranged 0–32 (our of a possible range of 0–40), with a higher score indicating greater difficulties. It was derived as the sum of four sub-scales measuring hyperactivity, conduct problems, peer problems and emotional problems.

Explanatory variables Four indicators, all reported by Parent 1 (Parent 1 is the parent who completed the two yearly survey—the mother in 98% of cases), were used to measure neighbourhood assets. In all cases, it was left to the respondent to interpret what they saw as their neighbourhood. The neighbourhood facilities scale (range = 1–5) comprised three items relating to public transport, shopping and other services, and exhibited good reliability ($\alpha = 0.960$). The neighbourhood belonging scale (range = 1–5; developed for the *Western Australian Child Health Survey*) was derived from four items covering perceptions of trust, shared values, people getting along with each other, and social cohesion, exhibiting high reliability ($\alpha = 0.951$). A neighbourhood liveability measure, taken from the Growing up in Ireland survey (www.growingup.ie) was calculated from two items relating to safety and recreational spaces (range = 1–5). Finally, an indicator on the general condition of buildings within 100 m of the family's home was derived from Parent 1's response on a single item (range = 1–3).

Control variables The Peer Positive Total Scale, summed from the study child's responses on 15 items, was an LSAC designed measure, mostly derived from an earlier measure by Oliveri and Reiss (1987) (range = 15–75; higher scores indicated more positive peer group characteristics; $\alpha = 0.886$). The parent-reported Parental Warmth scale (Paterson & Sanson, 1999) comprised six items measuring the parent's interaction with their child (range = 1–5, with higher scores indicating higher levels of parental warmth; $\alpha = 0.991$).

An Australian Census derived suburb-level indicator was used to measure the neighbourhood social and economic status in terms of people's access to material and social resources (Australian Bureau of Statistics, 2013). In the current study, the Index of Relative Socio-economic Advantage and Disadvantage (IRSAD) was used (range = 1–10; higher score indicates higher incidence of advantage). The Accessibility/Remoteness Index of Australia (ARIA) categorises all localities in Australia into five categories, reduced to four for the purposes of this analysis: highly accessible (major cities), accessible (inner regional Australia), moderately accessible (outer regional Australia) and remote/very remote. At the child's household level, a variable derived from household income and parents' educational achievements and occupations, transformed to a z score, was used as an indicator of social and material wellbeing (Baker et al., 2017). The study child's sex and age (in months) were also included as controls, as was an Indigenous status indicator for the study child's mother, and an indicator of whether the study child lived with both parents at age 12.

2.3 Statistical analysis

As the longitudinal data for children at ages 12–13, 14–15 and 16–17 were collected at different waves and nested within each individual, the data were analysed using a linear mixed-effects model. This method creates a two-level hierarchical model that nests time within individual (Bryk & Raudenbush, 1992; Miyazaki & Raudenbush,
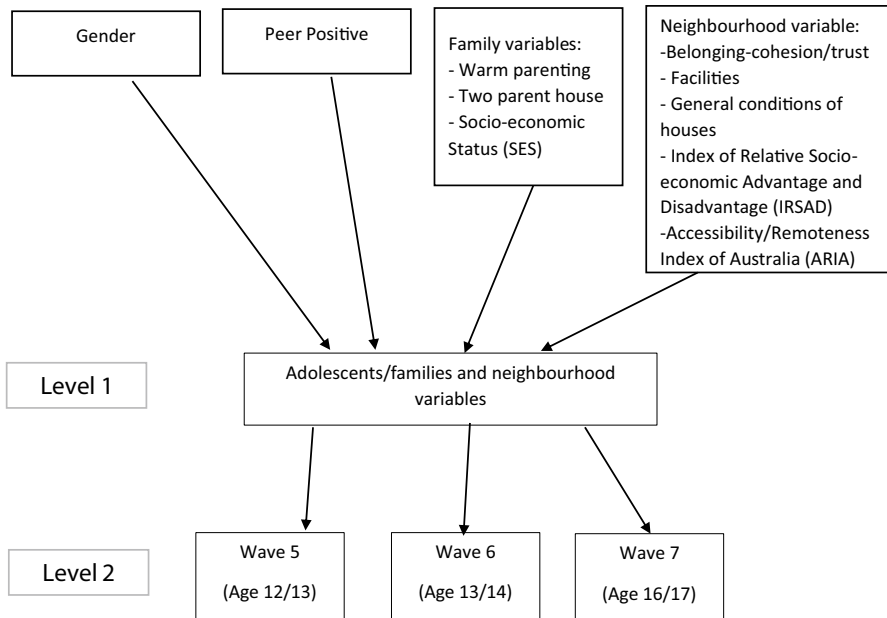
Fig. 1 Two-level mixed effect model

2000), and simultaneously examines the relationship within and between hierarchical levels of nested data. Variables at Level-1 were used to estimate the average within-person trajectory and linear rate of change over time. At Level-2, between-person variables were used to model the variation between individual trajectories. Level-1 therefore describes the trajectory of SDQ Total Difficulties score for each adolescent from ages 12–13 through 16–17 years, whereas the Level-2 estimates the between-child variation in SDQ score growth parameters. The theoretical model is illustrated in Fig. 1.

Since the LSAC data were based on a clustered sample design using primary sampling unit postcodes, the postcode indicator was also used as a control variable to reduce cluster sampling bias. The statistical analysis was undertaken using the Statistical Package for Social Sciences (SPSS), version 26.

3 Results

3.1 Descriptive Analysis

The distribution of the sample and outcome variables at three waves and the mean scores of predictors at Wave 5 are presented in Table 1. The mean adolescent SDQ Total Difficulties score at Wave 5 was 9.03, while the mean at Wave 7 was 11.12, indicating that on average, total difficulties increased with age. The average neighbourhood facilities score at age 12 was 3.96 (out of 5), the average neighbourhood social belonging-cohesion/trust

score was 3.60, and the average neighbourhood liveability score was 3.96. Two thirds (66.7%) of parents reported that buildings near their home were well kept, while 1.7% reported that they were in poor condition. The average warm parenting score reported by parents was 4.15, while the average peer positive score reported by the adolescent study children was 58.21.

The table also shows an even gender split in the sample (48.9% female), four in five (82.9%) of study children living with both parents, and 2.9% of mothers identifying as Indigenous. Average socio-economic status was measured in z scores with mean set to 0. Over half the study children were reported to be living in a 'highly accessible' area (i.e., a major city), while 3.8% were reported to live in a remote or very remote area. The average neighbourhood score on the IRSAD was 5.87.

3.2 Results from Multilevel Model

We examined interactions of all predictors with age 12 to allow the strength of the relationship to change with time. Only statistically significant interaction terms were included in the final model. Results are shown on Table 2. The estimate of the intercept ($\beta = 10.97$, $SE = 1.31$, $p < 0.001$) represents the mean SDQ Total Difficulties score at age 12–13 when all the continuous predictors are at their means and the categorical predictors are at the reference categories. The significant positive effect of "Age12" ($\beta = 0.38$, SE $= 0.04$, $p < 0.001$) indicates that the SDQ Total Difficulties score increased at the rate of 0.38 points for each additional year after 12 years of age.

Most level-2 predictors were statistically significantly associated with SDQ Total Difficulties at age 12. The estimated effect of gender showed that, on average, girls had higher SDQ difficulties scores at age 12 compared to boys ($\beta = 0.61$, SE $= 0.19$, $p < 0.001$). The significant positive estimate of interaction between gender and age showed that the increase in average SDQ Total Difficulties score for each additional year of age is greater for girls compared to boys. Higher peer positive scores were significantly associated with lower SDQ Total Difficulties score at age 12 ($\beta = -0.35$, SE $= 0.00$, $p < 0.001$). The significant positive interaction between peer positive and age 12 ($\beta = 0.03$, SE $= 0.04$, $p < 0.001$) indicates that as a child's age increased over time, an increase in the peer positive score was associated with a smaller decrease in SDQ Total Difficulties score. For a one unit increase in the parental warmth score above the mean, SDQ Total Difficulties scores at age 12 decreased by 0.49 points (SE $= 0.12$, $p < 0.001$). Living with both parents was also significantly associated with lower SDQ Total Difficulties scores, with scores higher where adolescents were not living with both parents at age 12 ($\beta = 0.67$, SE $= 0.22$, p $= 0.002$). When looking at the socio-economic position of the family, a one standard deviation increase in the family's socio-economic position was associated with a 0.39 point reduction in the SDQ scores at age 12 (SE $= 0.09$, $p < 0.001$). Young people residing in an area with a higher Socio-Economic Indexes for Areas (SEIFA) score showed lower SDQ scores at age 12.

Attention is now turned to neighbourhood indicators. Both of the indicators from external sources, ARIA remoteness and IRSAD, were at least partially significantly

Table 1 Descriptive statistics for child outcomes and socio-demographic characteristics

Variable	Number (%)	Range	Mean (SD)
Total participants at Wave 5	3956		
Total participants at Wave 6	3537		
Total participants at Wave 7	3089		
Child SDQ Total Difficulties score (Wave 5)[a]	3839	0—32	9.03 (5.56)
Child SDQ Total Difficulties score (Wave 6) [a]	3345	0—32	9.84 (5.93)
Child SDQ Total Difficulties score (Wave 7) [a]	2946	0—32	11.12 (5.86)
Child's age (years) at Wave 5		12.08—13.83	12.89 (0.31)
Child's age (years) at Wave 6		14.0—15.75	14.88 (0.34)
Child's age (years) at Wave 7		15.92—18.25	16.92 (0.37)
Gender at Wave 5			
Male	2020 (51.1)		
Female	1936 (48.9)		
Child has two parents in home (Wave 5) [b]			
No	674 (17.1)		
Yes	3277 (82.9)		
Mother's Indigenous status (Wave 5) [b]			
No	3843 (97.1)		
Yes	113 (2.9)		
Socio-economic status of household at Wave 5 [b]	3907	-5.34 – 2.83	0 (1.0)
Warm parenting score (Wave 5) [b]	3851	1.5—5.0	4.15 (0.64)
Peer positive total score (Wave 5) [a]	3841	19—75	58.21 (7.23)
Remoteness Area Classification (ARIA) at Wave 5 [c]			
Very remote/remote	149 (3.8)		
Moderately accessible	683 (17.3)		
Accessible	1079 (27.3)		
Highly accessible	2012 (50.9)		
Socio-economic advantage./disadvantage of the neighbourhood (IRSAD) [c]	3951	1–10	5.87 (2.851)
Neighbourhood facilities score (Wave 5) [b]	3842	1.0—5.0	3.96 (0.94)
Neighbourhood social belonging-cohesion/trust score (Wave 5) [b]	3841	1.0—5.0	3.60 (0.64)
Neighbourhood liveability score [b]	3842	1.0—5.0	3.96 (0.75)
General condition of nearby buildings [b]			
Poor condition/ Badly deteriorated	67 (1.7)		
Fair condition	873 (22.1)		
Well kept	2639 (66.7)		

a – study child report; b – parent report; c – external source. SDQ: Strengths and Difficulties Questionnaire: ARIA: Accessibility and Remoteness Index of Australia; IRSAD: Index of Relative Socio-economic Advantage and Disadvantage

associated with SDQ at age 12. While SDQ scores for young people living in remote or very remote areas were not predicted to be significantly different from the scores for young people living in highly accessible areas, the predicted scores for those

Table 2 Final linear mixed effect model for SDQ Total Difficulties

	Estimate	Std. Error	t	Sig	95% Confidence Interval	
					Lower Bound	Upper Bound
Fixed effects						
Intercept (at age 12)	10.966	1.312	8.361	<0.001	8.395	13.538
Age12	0.380	0.037	10.389	<0.001	0.308	0.451
Girls (vs Boys)	0.613	0.189	3.241	<0.001	0.242	0.985
Does not live with both parents	0.669	0.216	3.099	0.002	0.246	1.092
Mother is Indigenous	0.508	0.516	0.986	0.324	-0.503	1.519
Family socioeconomic position	-0.385	0.088	-4.365	<0.001	-0.558	-0.212
Peer positive	-0.345	0.013	-25.625	<0.001	-0.371	-0.318
Warm Parenting	-0.488	0.121	-4.021	<0.001	-0.726	-0.250
ARIA Remote/very remote (vs. highly accessible)	-0.221	0.483	-0.457	0.648	-1.169	0.727
ARIA Moderately accessible (vs. highly accessible)	-0.649	0.245	-2.647	0.008	-1.130	-0.168
ARIA Accessible (vs. highly accessible)	-0.311	0.192	-1.618	0.106	-0.688	0.066
IRSAD	-0.003	0.001	-2.097	0.036	-0.005	0.000
Belonging in neighbourhood	-0.628	0.161	-3.911	<0.001	-0.943	-0.313
Facilities in neighbourhood	-0.052	0.109	-0.477	0.633	-0.266	0.162
Neighbourhood liveability	-0.187	0.136	-1.373	0.170	-0.455	0.080
Buildings near study child's home in poor condition (vs. very good condition)	1.758	0.643	2.733	0.006	0.497	3.020
Buildings near study child's home in good condition (vs. very good condition)	0.174	0.188	0.924	0.355	-0.195	0.542
Interaction—girl*age	0.341	0.052	6.492	<0.001	0.238	0.444
Interaction—age * peer positive	0.028	0.004	7.441	<0.001	0.020	0.035
Interaction—age * belonging in neighbourhood	0.108	0.041	2.624	0.009	0.027	0.189

Table 2 (continued)

	Estimate	Std. Error	t	Sig	95% Confidence Interval	
					Lower Bound	Upper Bound
Postcode (sample)	0.000	0.000	-0.233	0.815	0.000	0.000
Random effects						
Level 1 (Within-person)						
Residual variance	11.088	0.305		<0.001	10.505	11.703
Level 2 (Between-persons)						
Intercept variance (Age12)	14.394	0.812		<0.001	12.888	16.077
Intercept-slope covariance	-0.495	0.190		0.009	-0.867	-0.123
Slope variance	0.509	0.065		<0.001	0.397	0.653

SDQ: Strengths and Difficulties Questionnaire: ARIA: Accessibility and Remoteness Index of Australia; IRSAD: Index of Relative Socio-economic Advantage and Disadvantage

Parent 1 is the parent who completed the two yearly survey. In about 97% of cases this was the mother

living in moderately accessible areas were significantly lower compared to those in highly accessible areas ($\beta = -0.65$, SE=0.25, p=0.008). The SDQ scores for adolescents at age 12 who were living in an area with a higher IRSAD score also were predicted to be slightly lower than the scores for adolescents in low IRSAD score areas ($\beta = -0.003$, SE=0.001, p=0.036). Among the four neighbourhood indicators based on parents' perspectives, the neighbourhood liveability and neighbourhood facilities indicators were found to be not significantly associated with young people's SDQ scores. On the other hand, neighbourhood belonging scores as represented by parental perception of social cohesion/trust in the neighbourhood were significantly associated with the adolescent study child's SDQ Total Difficulties score at age 12 ($\beta = -0.63$, SE=0.16, $p < 0.001$), suggesting a decrease in average SDQ score by 0.63 points for every unit increase in the neighbourhood belonging score above the mean. However, the estimate of the interaction between neighbourhood belonging and age was positive and significant ($\beta = 0.11$, SE=0.04, p=0.009). This indicates that when main effects and interactions are taken into account, higher neighbourhood belonging was associated with a smaller decrease in SDQ Total Difficulties score as young people got older.

The parental rating of the general condition of nearby houses in the neighbourhood was also significantly associated with the adolescent study child's SDQ scores. Young people living in neighbourhoods where the general condition of the nearby houses was 'very poor/deteriorated' had higher SDQ Total Difficulties scores at age 12, as compared to those living in areas where nearby houses were in 'very good' condition ($\beta = 1.76$, SE=0.64, p=0.006). The change in SDQ score was not statistically significant for those young people whose parents rated the general condition of nearby houses as 'fairly good' (compared with 'very good').

4 Discussion

It is well established that the social and emotional wellbeing of young people is contingent on where they live, and who they spend their time with (Benson et al., 2011). Yet the ecological domains of family, friends, and school have received the greatest empirical attention. In contrast, the current study builds off a less developed but growing literature that considers the role of the neighbourhood as an exosystem driving psychological outcomes (Visser et al., 2021). Using data from a nationally representative sample of Australian youth, this study examined the association between proposed neighbourhood-derived health assets and social and emotional wellbeing across time. The conceptualisation of neighbourhood-level assets as influencing adolescent social and emotional wellbeing suggests the potential to influence the wellbeing of all young people in the neighbourhood, irrespective of assets available to them at the level of the microsystem. In this sense the offer the opportunity to equalise outcomes among young people (Morgan & Ziglio, 2007).

This analysis focused on parent-reported indicators of neighbourhood belonging, facilities, liveability and physical condition of buildings in the neighbourhood. Although the hypothesis proposed all four indicators would protect against increases in social and emotional problems, only neighbourhood belonging and physical

condition of buildings emerged as significant predictors. However, in highlighting the significance of perceptions of neighbourhood belonging for adolescents' social and emotional wellbeing, this paper adds to the findings of Astell-Burt et al. (2012), whose research focuses on the association between external measures of neighbourhood material deprivation and adolescent wellbeing, and shows that perceptions of neighbourhood matter.

There are several explanations for why parental belonging in particular may influence adolescents' social and emotional wellbeing. First, belonging is intrinsically linked with social support which can buffer against stressful events, improve mental health outcomes, and foster resilience (Lee et al., 2018). In keeping with Bronfenbrenner's proposition that contexts are influential when they shape more proximal processes, parental wellbeing and use of adaptive coping strategies may promote less conflict within the household and promote better social and emotional outcomes among young people (Buehler, 2020). Alternatively, neighbourhood belonging may shape young peoples' interactions outside of the family home. Although cultural, family, and age differences are known to exist, parents retain a gatekeeper role that may dictate where adolescents can be, for how long, and with whom (Mitra et al., 2014). Thus, parents who trust others in their neighbourhood and feel a sense of belonging may be more likely to facilitate and permit young peoples' socialisation with others for longer durations, with more people, and in more spaces.

Neighbourhood facilities were measured in the current study with items broadly related to access to public transport, shopping, and other services. Using Bronfenbrenner's argument that contexts of development guide young people towards opportunities for interactions, it is likely that those without public spaces to interact and transportation options to leave should have reduced opportunities to hang out with peers and socialise in their community (Knöll & Roe, 2017). However, it is plausible that shifting trends in where and how adolescents interact may account for the null findings in the current study. Descriptive data routinely demonstrates that most young people interact with others at school, followed by online social networking and gaming sites (Lenhart, 2015; Reich et al., 2012). The provision of safe and accessible public spaces for young people is undoubtedly important, but online spaces are now surpassing offline realms for social interactions and may provide young people with viable and fulfilling alternatives when neighbourhood facilities are not available. Future research is required to further unpack the interplay between offline and online spaces.

4.1 Policy Implications

Although future consideration is required to unpack the specific mechanisms linking neighbourhood belonging among parents and young peoples' social and emotional wellbeing, the results of the current study provide a rationale to promote feelings of belonging and trust within neighbourhoods and communities. The environment in which young people live shapes their ability to access health promoting services and resources and hence is a significant determinant of their health and wellbeing (Boardman & Saint, 2005; Edwards, 2005; Sampson, 2008). This has implications for urban planning as well as social policy (Edwards & Bromfield, 2010). Although the research presented here did not

find a significant relationship between perceptions of neighbourhood facilities and liveability and young people's social and emotional wellbeing, it did find a significant relationship between measures of community social and economic advantage/disadvantage and adolescent social and emotional wellbeing. Moreover, other evidence indicates that provision of adequate resources at the neighbourhood level is important for improving adolescents' educational achievement and wellbeing (Leventhal & Brooks-Gunn, 2000; Oberwittler, 2007). Many interventions targeted at improvements in health for youth tended to be single domain ie school based. The findings in in this paper suggest that a comprehensive, holistic approach to interventions for young people grounded in an ecological understanding of the impact of neighbourhood, could add value and potentially prevent fragmented and siloed approach to young people's health. In addition, the research presented in this paper suggests the possibility that provision of resources at the neighbourhood level may be most effective in neighbourhoods where people enjoy high levels of belonging. Understanding the pathways from resources through belonging towards social and emotional wellbeing is an important issue for future policy-focused translational research.

4.2 Limitations

Utilising longitudinal data is a key strength of this study, as we were able to observe change over time, providing a richer examination of the relationship between health-related assets at the neighbourhood level and adolescents' social and emotional wellbeing than would be possible with cross-sectional analysis. However, three limitations in particular are worth flagging. First, like many publicly available longitudinal data files, many of the health-related assets, especially those related to neighbourhood under investigation were not measured consistently across the time period examined in this paper, when the study children were aged between 12 and 17 years. Given the purported interconnections between many of the health assets and the longitudinal bi-directional relationships researchers may expect (e.g., children's social and emotional wellbeing influencing their parents' perceptions of neighbourhood), the current study is limited by only considering assets at the first time point. Second, only parents' perceptions of neighbourhood were available in the survey dataset. While there is a strong justification for using parents' perceptions (Mitra et al., 2014), young people's own perceptions would undoubtedly add an important dimension to understandings of the relationship between neighbourhood and adolescent social and emotional wellbeing. Third, while the SDQ Total Difficulties score is widely used in studies of social and emotional wellbeing, it would perhaps be useful to also use it alongside a more positive measure of wellbeing, for example, a life satisfaction scale. However, this was not available in the survey dataset.

5 Conclusion

The findings of this study, which used data from a national cohort sample of young Australians aged between 12 and 17 years, revealed the role of neighbourhood as a protective asset for young people's social and emotional wellbeing. Efforts to analyse and improve young people's mental health have typically focused on school-based or family-based

interventions. The influence of neighbourhood assets on adolescents' social and emotional wellbeing highlighted in this paper suggests that interventions that are inclusive of the neighbourhood warrant consideration when interventions are being developed, not least because they have the potential to reduce inequalities among young people, at least at the level of the neighbourhood. The use of an asset-based framework could support the development of an evidence-based pathway to identify the interactions between neighbourhood and other factors that promote improved adolescent wellbeing.

Appendix

Variables used in analysis

Variable in the final model	LSAC items used to derive variable	Method of derivation
SDQ Total Difficulties scale	Study child response For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of how things have been for you over the last six months or this school year emotional symptoms: 1. I get a lot of headaches, stomach-aches or sickness 2. I worry a lot 3. I am often unhappy, depressed or tearful 4. I am nervous in new situations. I easily lose confidence 5. I have many fears, I am easily scared conduct problems: 1. I get very angry and lose my temper 2. I usually do as I am told.* 3. I can make other people do what I want 4. I am often accused of lying or cheating 5. I take things that are not mine from home, school or elsewhere hyperactivity/inattention: 1. I am restless, I cannot stay still for long 2. I am constantly fidgeting or squirming 3. I am easily distracted, I find it difficult to concentrate 4. I think before I do things.* 5. I finish the work I am doing, my attention is good.* peer relationship problems: 1. I would rather be alone than with people of my age 2. I have one good friend or more.* 3. Other people my own age generally like me.* 4. Other children or young people pick on me or bully me 5. I get on better with adults than people my age (all responses: 1 Not true; 2 Somewhat true; 3 Certainly true) * Reverse coded Each subscale is calculated as the mean of the five component items rescaled to be a integer between 0 and 10 where fewer than 3 component items are missing	Sum of the four SDQ subscales

Variable in the final model	LSAC items used to derive variable	Method of derivation
Peer Positive Total scale	Study child response This set of questions is about the kids that you spend time with. You might know these kids from school, your neighbourhood, or anywhere else. Think about these kids when you answer each of the questions 1. They read books for fun 2. They try to get away with things* 3. They get into trouble* 4. They work at school 5. They get into trouble at school* 6. They do well in school 7. They are good at sports 8. They are mean to other kids 9. They cheat on tests* 10. They go to religious services 11. They dislike school* 12. They are respectful of teachers 13. They put popularity above good grades* 14. They are involved in out of school activities 15. They make you do things you're ashamed of* (responses: 1 None of them; 2 One or two of them; 3 Some of them; 4 Most of them; 5 All of them) * Reverse coded	Sum of responses to 15 items
Warm parenting scale	Parent 1 response In the last six months how often did you…? 1. Express affection by hugging, kissing and holding this child 2. Hug or hold this child for no particular reason 3. Tell this child how happy he/she makes you 4. Have warm, close times together with this child 5. Enjoy listening to the child and doing things with him/her 6. Feel close to the child both when he/she was happy and when he/she was upset (responses: 1 Never/Almost never; 2 Rarely; 3 Sometimes; 4 Often; 5 Always/Almost always)	mean of responses to 6 items
Neighbourhood facilities scale	Parent 1 response How strongly do you agree or disagree with these statements about your neighbourhood? ('Neighbourhood' is as defined by respondent) 1. There is access to close, affordable, regular public transport in this neighbourhood 2. There is access to basic shopping facilities in this neighbourhood 3. There is access to basic services such as banks, medical clinics, etc. in this neighbourhood (responses: 1 Strongly agree; 2 Agree; 3 Neither disagree nor agree; 4 Disagree; 5 Strongly disagree)	mean of responses to 3 items

Variable in the final model	LSAC items used to derive variable	Method of derivation
Neighbourhood belonging (social cohesion and trust)	Parent 1 response To what extent do you agree or disagree with the following statements about your neighbourhood? ('Neighbourhood' is as defined by respondent) 1. This is a close-knit neighbourhood 2. People in this neighbourhood generally don't get along with each other.* 3. People in this neighbourhood do not share the same values.* 4. Most people in your neighbourhood can be trusted (responses: 1 Strongly agree; 2 Agree; 3 Neither agree nor disagree; 4 Disagree; 5 Strongly disagree) *Reverse coded	mean of responses to 4 items
Neighbourhood liveability	Parent 1 response How strongly do you agree or disagree with these statements about your neighbourhood? ('Neighbourhood' is as defined by respondent) 1. This is a safe neighbourhood 2. There are good parks, playgrounds and play spaces in this neighbourhood (responses: 1 Strongly agree; 2 Agree; 3 Neither disagree nor agree; 4 Disagree; 5 Strongly disagree)	Mean of responses to 2 items
General condition of houses	Parent 1 response How would you rate the general condition of most of the buildings nearby, say within 100 m of the respondent's house? 1. Badly deteriorated 2. Poor condition with peeling paint and need of repair 3. Fair condition 4. Well-kept with good repair and exterior surface	Recoded as: 1 very poor/ deteriorated; 2 Fairly good; 3 Very good
ARIA Remoteness	Externally sourced data Remoteness Area Classification 0. Highly accessible; 1. Accessible; 2. Moderately accessible; 3. Remote; 4. Very remote	Recoded as: 0 Very remote/ remote; 1 Moderately accessible; 2 Accessible; 3 Highly accessible
Measure of community socio-economic advantage/ disadvantage	Externally sourced data Index of social and economic advantage/disadvantage calculated from 2011 Census data at the level of the postcode	Summary decile group score ranges from 1 (highly disadvantaged) to 10 (highly advantaged)
Study child lives with two parents	Study child has two parents at home	Yes/no

Variable in the final model	LSAC items used to derive variable	Method of derivation
Household socio-economic status	Parent 1 response Derived from extensive questions about income of all household members, and parents' education and occupation	standardised z-score, mean = 0, SD = 1

Parent 1 is the parent who completed the two yearly survey.

Data Availability All the data are presented within the manuscript and supplementary materials.

Declarations

Ethical Approval The project ethical approval granted by the Flinders University Human Research Ethics Committee (HREC)_3819. The permission to get access to the longitudinal study of Australian children (LSAC) data granted by the Australian Data Archive (ADA) on behalf of the data owner(s): Department of Social Services; Australian Institute of Family Studies, and Australian Bureau of Statistics. No human participants or animals are involved in this project.

Conflict of Interest The authors declare that there is no conflict of interest.

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