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ORIGINAL PAPER

Adolescent School Belonging and Mental Health Outcomes in Young Adulthood: Findings from a Multi-wave Prospective Cohort Study

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Abstract

School belonging, sometimes referred to as school belonging or school connectedness, involves dimensions like positive affect towards school, relationships with teachers, and feeling socially valued. Previous research points to immediate benefits for students' mental health and wellbeing; however, evidence on the potential long-term benefits of school belonging for mental health—once young people leave the school setting—is limited. This study used data on 1568 adults from the Australian Temperament Project (ATP), a 16-wave longitudinal study which has tracked participants since infancy. The short form of the Australian Council for Educational Research (ACER) School Life Questionnaire was used to assess secondary school belonging at age 15–16 years whilst young adult mental health symptoms were evaluated using the Depression, Anxiety and Stress Scales (DASS-21) at 19–20, 23–24, and 27–28 years. Generalised Estimating Equation models were used to examine the link between secondary school belonging and mental health symptoms in young adulthood. Results showed that higher levels of all aspects of school belonging were associated with lower mental health symptoms across young adulthood (β range -0.05 to -0.20). Associations were similar by gender. These findings underscore the importance of adolescent school belonging and in particular school status in reference to feeling socially valued, as a long-term protective factor that can mitigate against later depression, anxiety, and stress.

Keywords School belonging · Adolescence · Stress · Depression · Anxiety · Longitudinal research

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School belonging, sometimes referred to as school bonding or school connectedness, is considered integral to positive school experiences. It refers to "the extent to which students feel personally accepted, respected, included, and supported by others in the school social environment" (Goodenow & Grady, 1993, p. 80) and is malleable with some interventions/programs showing the potential to shift levels of school belonging in school populations (see Allen, Jamshidi et al., 2021b for a review). Belonging at school has moderate to strong links with academic motivation (Allen et al., 2018a, b; Gehlbach et al., 2016; Korpershoek, et al., 2020), healthy psychological functioning (Abdollahi et al., 2020; Allen et al., 2019; Arslan et al., 2020; Connell & Wellborn, 1991; Sirin & Rogers-Sirin, 2004), wellbeing (Arslan, 2018; Kopelman-Rubin et al., 2021; Tian et al., 2016), and social connectedness (Marler et al., 2021) during the secondary school years. Reflecting this, the OECD (2022) has identified belonging as a major trend in education with potential to counter increasing loneliness, social isolation and mental health problems occurring in many societies. To achieve this

kind of effect on population mental health, school belonging would need a sustained impact that extends beyond the school setting by setting a strong foundation for engagement with a range of new environments and relationships during the transition to adulthood. Yet the nature of current, predominantly school-based research designs confined to tracking students during the school years, means that the longer-term impact of school belonging is poorly understood. Hence, there is a need for further evidence to inform current discussions about the potential value and benefits of school belonging as an intervention target with potentially lasting impacts.

Conceptualisations of School Belonging

Whilst variously defined and operationalised in the literature (Askell-Williams et al., 2018; Libbey, 2004; Terrett et al., 2012), school belonging refers to a student's attachment, safety, and affiliation with their school (Allen et al., 2022; Goodenow & Grady, 1993; Terrett et al., 2012). Overall, it captures a student's sense of feeling valued and cared for at school (Ainley et al., 1986; Terrett et al., 2012).

Approaches to measuring and operationalising school belonging have identified both emotional and cognitive dimensions, such as the quality of relationships with teachers and peers, sense of enjoyment of school, beliefs in the value of school, and perceptions of status within the school system (Allen et al., 2018a, b; Allen, Slaten et al., 2021c; Terrett et al., 2012). A further aspect of school belonging is a sense of social identity and a conferred status. For example, through membership of social groups within classrooms or school communities, students may experience feelings of being valued by their peers and other school personnel (Grey, 2012, 2017). In addition, schools have been seen as not only providing a group identity through belonging, but also an individual identity through differentiation from broader groups (Hornsey & Jetten, 2004). Together, these dimensions relate to the overarching construct of school belonging, considered a crucial component of emotional or affective engagement with learning and the school environment (Korpershoek, et al., 2020).

School Belonging and Mental Health

The understanding that a sense of belonging protects against mental ill-health emerged through various theoretical models and empirical research (Allen et al., 2018a, b; Arslan & Allen, 2021). Baumeister and Leary's (1995) *belongingness hypothesis* states that humans have an innate and powerful drive to form and maintain positive relationships. According to the hypothesis, fulfilling one's sense of belonging provides positive psychological outcomes such as improved wellbeing and mental health. In an extension of this hypothesis, sociometer theory (Leary, 2012) proposes that individuals constantly monitor the degree to which they belong or are excluded. This monitoring is believed to be particularly sensitive to ostracism and rejection, two social processes that have been explicitly linked to poorer mental health (Williams & Nida, 2017). Further, coping and stress models posit that perceived social connectedness and social support provide a buffer against the impact of stressful events and negative psychological outcomes (Frydenberg, 2017; Frydenberg et al., 2012; Praharso et al., 2017; Saeri et al., 2018).

Finally, attachment theory emphasises the emotional bond between caregivers and child that serves to lay the foundation for relationships with others over the life course (Bowlby, 1969). In accordance with attachment theory, the Social Development Model (Catalano & Hawkins, 1996) argues that bonding to school (in addition to family, peers and community) fosters more positive developmental trajectories (Catalano & Hawkins, 1996), setting a strong foundation for engagement with new environments and relationships as individuals transition to subsequent developmental periods. This suggests that school belonging, reflecting a secure attachment to school, may have long-term benefits that extend across the lifespan. If so, this makes the promotion of school belonging a key early intervention strategy for improving population mental health.

Supporting these theoretical perspectives on potential benefits, cross-sectional empirical evidence has shown that higher levels of adolescent school belonging are associated with better mental health outcomes. These outcomes include lower levels of anxiety (Babakhani, 2014), depression (Heck et al., 2014), and alcohol and marijuana use (Rostosky et al., 2003). School belonging has been positively associated with improved academic hardiness (Abdollahi et al., 2020), life satisfaction (Arslan et al., 2020; Moffa et al., 2016), self-esteem (O'Rourke & Cooper, 2010), positive identity formation (Brechwald & Prinstein, 2011; Davis, 2012), resilience (Scarf et al., 2016), and better sleep (Huynh & Gillen-O'Neel, 2016). A limitation of these cross-sectional studies is the inability to disentangle the potential for reverse causation, whereby mental health also impacts on experiences of school belonging (e.g. due to internalising behaviours related to withdrawal and cognitive distortions impacting on perceived social standing).

Some longitudinal studies that offer the opportunity to unpick this temporality have suggested more enduring effects related to adolescent school belonging, albeit only with limited short-term follow-up. For example, in a sample of 504, 12–14-year-old Australians, school belonging (including higher levels of caring relations with teachers and peers, acceptance, and lower levels of rejection) predicted lower levels of depressive symptoms 12 and 18 months later

(Shochet et al., 2011). Likewise, in a sample of 402 students aged 10–15 years from two Turkish urban public secondary schools, school belonging predicted lower levels of internalised problems (depression, anxiety, and suicidal ideation), externalised problems (substance use and delinquency), and higher levels of life satisfaction up to seven months later (Arslan et al., 2020).

Much less is known about the effects of school belonging on mental health outcomes in young and middle adulthood. Steiner and colleagues (2019) found that higher levels of school connectedness (referring to a sense of caring, support, and belonging) in US adolescents in grades 7–12 (median age 15 years) predicted reduced depressive symptoms and suicidal ideation at ages 24 and 32 years. Similarly, Nyberg et al. (2019) found that increased school connectedness (capturing school enjoyment and engagement) at age 16 years was associated with decreased symptoms of both depression and anxiety at age 43. These findings suggest the importance of nurturing school environments in fostering mental health and wellbeing, across adolescence and into adulthood (Bronfenbrenner, 1979; Catalano & Hawkins, 1996).

Given limited evidence on the long-term implications of school belonging, more research is required to delineate the relationship between school belonging in adolescence and a range of mental health outcomes in adulthood. As well as limited follow-up, current research has also faced measurement challenges. Steiner et al. (2019) and Nyberg et al. (2019) both measured school connectedness using brief measures of only six items which had not been validated for the population. Yet, as noted above, research has demonstrated that school belonging consists of several interrelated factors (Ainley et al., 1986). In addition, the contribution of factors such as positive affect, relationships with teachers, feeling socially valued, and long-term relevance of schooling (opportunity) to school belonging have not been extensively evaluated in reference to mental health outcomes.

Gender and School Belonging

Although several studies have reported that gender does not appear to directly impact a student's sense of school belonging (e.g. Allen et al., 2018a, b), results from the recent Programme for the International Student Assessment (PISA) found girls were more likely to feel they belonged at school than boys (Palikara & Allen, 2022). Such differences have been attributed to gendered socialisation and social adjustment patterns (Sánchez et al., 2005; Vaz et al., 2015). Indeed, gender differences in school belonging have been associated with a range of outcomes such as delinquency, substance abuse, and academic achievement, with girls generally experiencing more positive outcomes than boys (e.g. Hughes et al., 2015; Maddox & Prinz, 2003; Oelsner et al., 2011; Sánchez et al., 2005). However, previous prospective studies have not investigated gender differences in respect to school belonging and mental health. Given gender differences in rates of anxiety and depression (Howard et al., 2017) and in school belonging (Palikara & Allen, 2022), the potential moderating effect of gender on the relationship between school belonging and mental health remains an important area of research.

Current Study

The present study draws on prospective data from one of Australia's longest running population-based studies of socioemotional development, to examine the extent to which different facets of school belonging in late secondary school (15–16 years) predict anxiety, depression, and stress across three waves in young adulthood (19–20, 23–24 and 27–28 years), and the extent to which gender moderates any associations found. By extending the work of Steiner et al. (2019) and Nyberg et al. (2019) which broadly examined how connectedness, as a single construct, was linked with mental health outcomes in adulthood as discussed above), this study investigates the role of the various facets of school belonging in adolescence on anxiety, depression and stress levels later in life. School belonging is operationalized by the *School Life Questionnaire* (Ainley et al., 1984), to capture key elements of previous definitions of school belonging, including emotional and cognitive dimensions of belonging, by surveying relationships, positive affect, and school pride (Terrett et al., 2012).

Specific questions the study was designed to answer were:

1. To what extent does school belonging in the final year of high school predict mental health problems (anxiety, depression, and stress) in young adults?
2. Is the relationship between school belonging and mental health (stress, anxiety, and depression) moderated by gender?

Method

Participants

Participants were drawn from the Australian Temperament Project (ATP), a 16-wave longitudinal study tracking the psychosocial development of young people from infancy to adulthood. The baseline sample consisted of 2443 infants aged between 4 and 8 months, recruited in 1983 from urban and rural areas and representative of the state of Victoria, Australia. Since then, families have been

invited to participate via mail surveys approximately every 2 years until 19–20 years of age and every 4 years thereafter (Vassallo & Sanson, 2013). The ATP has sustained approximately 1% attrition per annum, which is comparable to other major cohort studies. Data collection waves were approved by Human Research Ethics Committees at the University of Melbourne, the Australian Institute of Family Studies and/or the Royal Children's Hospital, Melbourne. To be included in the current study, participants needed to have provided data on key study variables at either late secondary school (15–16 years) or young adulthood (19–20, 23–24, and 27–28 years). The resulting sample size used for this study was 1568 (805 women).

Measures

School Belonging

School belonging was assessed at 15–16 years using the short form of the Australian Council for Educational Research (ACER) School Life Questionnaire (Ainley et al., 1986) which has been validated for use with Australian secondary school students (Ainley & Sheret, 1992). The five dimensions of school belonging included positive affect towards school (5-items, $\alpha = 0.86$, e.g. "I feel proud to be a student"), relationship with teachers (5-items, $\alpha = 0.83$, e.g. "teachers treat me fairly in class"), school provides status (defined as perceptions of prestige or social value in reference to significant others ('My school is a place where I am treated with respect') (5-items, $\alpha = 0.82$, e.g. "people look up to me"), relevance of schooling (4-items, $\alpha = 0.82$, e.g. "the things I learn are important to me"), and confidence in ability to be successful in school work (5-items, $\alpha = 0.83$, e.g. "I achieve a satisfactory standard in my work"). In line with a broad multidimensional conceptualisation of school belonging, the dimensions of the scale capture psychological, cognitive and emotional aspects (i.e. general feelings about school, quality of relationships, feelings of inclusion/being respected, identity, perceived usefulness of the school/curriculum and self-efficacy/confidence) which are integral to belonging (Allen et al., 2016; Allen et al., 2018a, b, 2021a, b, c). We additionally derived a composite measure of school belonging, as the average score across each subscale. Responses ranged from 1 *'definitely disagree'* to 4 *'definitely agree'* such that higher scores indicated greater school belonging.

Mental Health Symptoms

At each young adult wave, mental health symptoms were assessed using the short-form Depression Anxiety and Stress Scales (DASS-21, Antony et al., 1998; Lovibond & Lovibond, 1995). The DASS-21 has established internal consistency, with coefficient alphas > 0.81 for the Depression, Anxiety and Stress subscales (Antony et al., 1998; Clara et al., 2001). Participants rated their experience of depression (7-items, $\alpha_{19\text{-}20} = 0.89$, $\alpha_{23\text{-}24} = 0.90$, $\alpha_{27\text{-}28} = 0.91$, e.g. "I couldn't seem to experience any positive feeling"), anxiety (7-items, $\alpha_{19\text{-}20} = 0.77$, $\alpha_{23\text{-}24} = 0.78$, $\alpha_{27\text{-}28} = 0.80$, e.g. "I felt scared without any good reason") and stress symptoms (7-items, $\alpha_{19\text{-}20} = 0.83$, $\alpha_{23\text{-}24} = 0.83$, $\alpha_{27\text{-}28} = 0.83$, e.g. "I found it hard to wind down") during the past week on a scale ranging from 0 "*did not apply to me at all"* to 3 "*applied to me very much or most of the time"*. As such, the total possible scores range from 0 to 21 on each subscale (i.e. depression, anxiety, and stress).

Potential Confounding Factors

Potential confounding variables included parent country of birth (either parent not born in Australia), experience of parental separation/divorce and low parental education (< year 12) during the participant's childhood (ages 0–13 years) as both the home environment and these family backgrounds are known to influence feelings of belongingness (Chiu et al., 2016; Hautala et al., 2022). We also included participant sex at birth measured in infancy. Because school belonging can not only influence mental health, but also be influenced by mental health (Bond et al., 2007), we included internalising and externalising problems at earlier waves and antisocial behaviour across ages 13–18 years (two of the following behaviours occurring at least once or one behaviour more frequently: physical fights, damaged something, stolen something, driven a car without permission, been suspended/expelled from school, graffitied, carried a weapon, run away from home). Elevated depression or anxiety at age 13–14 years was assessed with the Short Mood and Feelings Questionnaire (Angold et al., 1995) and the Revised Behaviour Problem Checklist Short Form adapted for self-report (Quay & Peterson, 1987), respectively.

Statistical Analysis

All analyses were conducted in Stata 17 (StataCorp, 2021). Each mental health subscale score (depression, anxiety, and stress) was examined separately and treated as a multivariate outcome (i.e. repeated measures at age 19–20, 23–24, and 27–28 years within each person). Generalised estimating equations (GEEs) with an exchangeable working correlation structure were used to estimate a series of linear regression analyses examining associations between secondary school belonging and each mental health outcome across young adulthood. First, mental health symptom scores were regressed onto each school belonging dimension separately, both unadjusted and adjusted for potential confounding

variables. Adjusted analyses were then repeated to determine if associations were similar across young adult waves (i.e. age 19–20, 23–24, and 27–28 years) and across participant gender by including an interaction between school belonging dimensions and a variable denoting young adult wave and gender, respectively. Finally, mental health was regressed onto all five school belonging dimensions simultaneously.

Multiple imputation was used to handle missing data. Twenty complete datasets were imputed, based on a multivariate normal model (Lee & Carlin, 2010). Binary variables were imputed as continuous variables and then back transformed with adaptive rounding (Bernaards et al., 2007) following imputation. Estimates were obtained by pooling results across the 20 imputed datasets using Rubin's (1987) rules. Prior to GEE analyses, all outcomes and dimensions were standardised (z-scores) within each imputation, such that effect sizes are interpreted as the standard deviation change in mental health symptoms for every standard deviation change in school belonging. Effect sizes were evaluated based on contemporary thresholds whereby 0.5 indicates a very small effect, 0.10 indicates a small effect, 0.20 indicates a medium effect, 0.30 indicates a large effect, and 0.40 indicates a very large effect (Funder & Ozer, 2019).

Data, Materials and Code

All analytical code for this study is available in a public repository (https://osf.io/qhjxr/?view_only=81932f5f927d49bbbd1d1953c7fbe35f). Ethics approvals for this study do not permit these potentially re-identifiable participant data to be made publicly available. Enquires about collaboration are possible through our institutional data access protocol: https://lifecourse.melbournechildrens.com/data-access/. The current institutional body responsible for ethical approval is The Royal Children's Hospital Human Research Ethics Committee.

Results

Descriptive Statistics

Table 1 presents a descriptive summary of the mental health outcomes, school belonging dimensions, and potential confounding factors (all unstandardized). On average, participants reported that they "mostly agreed" with statements pertaining to overall school belonging (mean = 2.96) and each school belonging factor (mean range = 2.73 to 3.16). Correlations between dimensions of school belonging were generally moderate to high, ranging from 0.44 to 0.65. Mean scores on depression, anxiety and stress fell within normal population ranges (Lovibond & Lovibond, 1995) and tended to decrease over time. Similarly, scores on depression, anxiety, and stress were moderately correlated with one another and over the time points over the young adult period, ranging from 0.29 to 0.71.

School Belonging and Mental Health Outcomes

Findings from the GEE analyses, in which depression, anxiety, and stress symptoms scores (age 19–20, 23–24, 27–28 years) were regressed onto overall school belonging and each school belonging dimension (age 15–16 years), are presented in Table 2. Following adjustments, evidence suggested that higher levels of all measures of school belonging were associated with lower levels of depression (overall school belonging $\beta = -0.16$, dimensions β range $= -0.10$ to -0.19; small effect), anxiety (overall school belonging $\beta = -0.10$, dimensions β range $= -0.05$ to -0.10; very small to small effect), and stress (overall school belonging $\beta = -0.08$, dimensions β range $= -0.05$ to -0.09; very small effect). We did not find evidence that associations differed by outcome wave or participant gender ($p > 0.05$ for all interactions).

When all five school belonging dimensions were modelled simultaneously, only increases in the "school provides status (social value)" dimension was independently associated with lower levels of depressive ($\beta = -0.17$; small effect), anxiety ($\beta = -0.07$; very small effect), and stress ($\beta = -0.07$; very small effect) symptoms (see Table 3).

Discussion

We examined the extent to which positive school belonging in late secondary school is associated with levels of anxiety, depression, and stress across young adulthood. We found that reduced school belonging, particularly in relation to status, but specifically feeling socially valued, predicted long-term risk for mental health problems during early adulthood. Further, the strength of the associations was similar for both female and male students. By examining school belonging in a multi-faceted framework and exploring associations across almost a decade of young adulthood, these findings make a unique and important contribution to the existing evidence base.

Broadly, the current findings support previous theory and literature on the long-term benefits of school belonging in adolescence (Nyberg et al., 2019; Steiner et al., 2019) and extend on previous work by showing the robustness of associations between school belonging and mental health symptoms across three waves in young adulthood and in both women and men. This is in line with Baumeister and Leary's belongingness hypothesis (1995), which posits that humans have an innate need to form and maintain positive relationships. Our results support this hypothesis by demonstrating

Table 1 Descriptive statistics for school belonging, mental health symptoms and potential confounding factors

	Mean	SD	95% CI	% missing
School belonging				
Overall	2.96	0.46	(2.94, 2.99)	18%
Positive affect towards school	2.73	0.62	(2.70, 2.77)	18%
Relationship with teachers	3.00	0.55	(2.97, 3.03)	18%
Status (social value)	2.85	0.53	(2.82, 2.88)	18%
Relevance of schooling	3.06	0.59	(3.03, 3.10)	18%
Confidence in ability/success	3.16	0.52	(3.13, 3.19)	18%
Mental health symptoms				
Depression				
19–20 years	3.80	4.05	(3.57, 4.04)	27%
23–24 years	3.32	3.72	(3.08, 3.55)	37%
27–28 years	3.11	3.61	(2.89, 3.33)	35%
Anxiety				
19–20 years	2.69	3.05	(2.52, 2.87)	27%
23–24 years	2.28	2.76	(2.11, 2.45)	37%
27–28 years	2.03	2.54	(1.87, 2.18)	35%
Stress				
19–20 years	5.02	3.76	(4.80, 5.24)	27%
23–24 years	4.98	3.64	(4.76, 5.21)	37%
27–28 years	4.83	3.45	(4.62, 5.04)	35%
	N	%	95% CI	% missing
Potential confounding factors				
Parent < year 12 education	419	27%	(25, 29%)	0%
Parent separation or divorce	240	16%	(14, 18%)	3%
Parent non-Australian born	420	28%	(26, 30%)	4%
Adolescent gender (female)	805	51%	(49, 54%)	0%
Adolescent delinquency	315	25%	(22, 27%)	18%
Adolescent depression or anxiety	263	20%	(18, 23%)	18%

Scores for subscales of school belonging ranged from 1 to 4 such that higher scores indicated greater school belonging. Scores for subscales of the DASS-21 (i.e. depression, anxiety and stress) each ranged from 0 to 21

that a multi-faceted sense of school belonging is associated with fewer symptoms of depression and anxiety.

Whilst effect sizes ranged from very small to small, they are notable given the length of time (4–12 years) between the assessment of school belonging and mental health outcomes (Ben-Shlomo & Kuh, 2002; Funder & Ozer, 2019). Furthermore, effect sizes were similar to or larger than those reported previously for depressive symptoms (Nyberg et al., 2019; Steiner et al., 2019), but were smaller than previous findings for anxiety related outcomes (Nyberg et al., 2019). However, even small shifts in the population distribution of mental health symptoms towards the desired direction can be meaningful if large numbers of individuals are impacted over time (Rose, 2001).

Of note, when accounting for all domains of school belonging simultaneously, only increased status (feeling socially valued) was independently associated with decreased levels of depressive, anxiety, and stress symptoms. This factor captured the relative degree of feeling socially valued accorded to students by significant others within the school, with items including "people look up to me", "other people care what I think", "I know people think a lot of me", "I feel important", and "I feel proud of myself" (Picou & Carter, 1976; Reitzes & Mutran, 1980). These findings underscore the critical importance of feeling valued and social identity in students' future mental health outcomes. Carpiano and Hystad (2011) suggested that when people feel valued and have a sense of belonging to a specific group, they experience increased happiness. Opportunities to build a sense of pride and self-worth during secondary school, especially through positive social interactions that value and respect students' contributions, appear to help buffer students from developing later mental health problems. Schools provide an important source of social identity through belonging, differentiation from peers, and by conferring status. An ongoing lack of attachment to school can lead

Table 2 Associations between multivariate mental health symptoms (at age 19–20, 23–24, 27–28 years) and school belonging (at age 15–16 years)

	Unadjusted			Adjusted			Interaction *p* value	
	β	95% CI	*p*	*β*	95% CI	*p*	Wave	Gender
	Depressive symptoms							
Overall school belonging	−0.19	(−0.23, −0.14)	<0.001	−0.16	(−0.21, −0.11)	<0.001	0.973	0.895
Positive affect towards school	−0.14	(−0.18, −0.09)	<0.001	−0.12	(−0.16, −0.07)	<0.001	0.951	0.676
Relationship with teachers	−0.13	(−0.18, −0.09)	<0.001	−0.12	(−0.17, −0.07)	<0.001	0.829	0.830
Status (socialy valued)	−0.22	(−0.28, −0.17)	<0.001	−0.19	(−0.25, −0.14)	<0.001	0.884	0.780
Relevance of schooling	−0.11	(−0.16, −0.06)	<0.001	−0.10	(−0.15, −0.05)	<0.001	0.902	0.889
Confidence in ability/success	−0.15	(−0.20, −0.10)	<0.001	−0.13	(−0.18, −0.08)	<0.001	0.842	0.734
	Anxiety symptoms							
Overall school belonging	−0.12	(−0.17, −0.07)	<0.001	−0.10	(−0.15, −0.05)	<0.001	0.250	0.888
Positive affect towards school	−0.09	(−0.14, −0.04)	<0.001	−0.07	(−0.12, −0.02)	0.004	0.205	0.757
Relationship with teachers	−0.09	(−0.14, −0.05)	<0.001	−0.08	(−0.13, −0.03)	0.001	0.050	0.733
Status (socially valued)	−0.13	(−0.18, −0.08)	<0.001	−0.10	(−0.15, −0.05)	<0.001	0.205	0.974
Relevance of schooling	−0.07	(−0.12, −0.02)	0.007	−0.05	(−0.10, −0.00)	0.032	0.628	0.892
Confidence in ability/success	−0.11	(−0.16, −0.05)	<0.001	−0.09	(−0.14, −0.03)	0.002	0.106	0.897
	Stress symptoms							
Overall school belonging	−0.10	(−0.14, −0.05)	<0.001	−0.08	(−0.12, −0.03)	0.001	0.884	0.544
Positive affect towards school	−0.08	(−0.12, −0.03)	0.002	−0.06	(−0.11, −0.02)	0.008	0.522	0.880
Relationship with teachers	−0.07	(−0.12, −0.02)	0.004	−0.06	(−0.11, −0.01)	0.011	0.645	0.512
Status (socially valued)	−0.12	(−0.16, −0.07)	<0.001	−0.09	(−0.13, −0.04)	<0.001	0.734	0.600
Relevance of schooling	−0.06	(−0.11, −0.01)	0.011	−0.05	(−0.10, −0.00)	0.037	0.962	0.797
Confidence in ability/success	−0.07	(−0.12, −0.02)	0.005	−0.05	(−0.10, −0.00)	0.043	0.998	0.538

School belonging measures entered into separate regressions for each outcome

Table 3 Independent associations between multivariate mental health symptoms (at age 19–20, 23–24, 27–28 years) and school belonging (at age 15–16 years)

	β	95% CI	*p*
	Depressive symptoms		
Positive affect towards school	0.02	(−0.05, 0.10)	0.532
Relationship with teachers	−0.04	(−0.10, 0.02)	0.235
Status (socially valued)	−0.17	(−0.24, −0.11)	<0.001
Relevance of schooling	0.00	(−0.06, 0.07)	0.957
Confidence in ability/success	−0.03	(−0.10, 0.04)	0.374
	Anxiety symptoms		
Positive affect towards school	0.00	(−0.08, 0.08)	0.945
Relationship with teachers	−0.03	(−0.10, 0.03)	0.292
Status (socially valued)	−0.07	(−0.13, −0.00)	0.037
Relevance of schooling	0.02	(−0.05, 0.08)	0.555
Confidence in ability/success	−0.04	(−0.12, 0.04)	0.289
	Stress symptoms		
Positive affect towards school	−0.02	(−0.09, 0.06)	0.690
Relationship with teachers	−0.02	(−0.09, 0.04)	0.486
Status (socially valued)	−0.07	(−0.14, −0.01)	0.020
Relevance of schooling	−0.01	(−0.07, 0.06)	0.865
Confidence in ability/success	0.02	(−0.05, 0.09)	0.625

School belonging measures entered into a single regression for each outcome; models adjusting for all potential confounding factors

to negative achievement emotions such as less enjoyment and pride, more boredom, increased feelings of hopelessness, and shame (Grey, 2017). Our results suggest a strong sense of identity, facilitated by both belonging and a sense of feeling socially valued at school by others, increased the likelihood of more positive adult mental health outcomes.

Implications

The results of this study strengthen the evidence base regarding the role of school belonging as a protective factor with lasting implications for mental health outcomes into the adult years. The possibility that the mental health outcomes associated with school belonging are due to pre-existing mental health problems was minimised by adjusting for earlier depressive and anxiety symptoms at 13–14 years. This is the first study, to our knowledge, to examine these relationships across multiple waves post-school with this length of follow-up.

The findings add to the growing body of research which suggests that school belonging should be a key consideration for schools seeking to promote positive mental health in the short- and long-term (Allen et al., 2018a, b; Parr et al., 2020; Steiner et al., 2019). Given that many mental health problems have their origins in the early life course, between 12 and 25 years old (Gustavson et al., 2018; Jones, 2013; Vaz et al., 2014) and that mental health problems are often challenging for individuals, families and/or society as a whole (Müller et al., 2021; Trautmann et al., 2016), it is imperative that parents, education and healthcare professionals, and policy makers are aware of the protective effects of a sense of belonging during adolescence. This not only may assist the reduction of mental health problems in the school years, but also reduce mental health risks later on into adulthood.

The current findings support whole school approaches that incorporate targeted programs that aim to enhance students' sense of belonging. These could range from social belonging interventions to target perceptions of belonging (Walton & Cohen, 2007), peer mentorship programs or support networks, to curricular changes that incorporate social-emotional competencies (see Allen, Jamshidi et al. 2021b). Schools should consider how they provide students with opportunities to belong, whether that be through clubs or groups or school-initiated social activities (Allen et al., 2023). Schools should tailor their belonging strategies to fit their unique contexts, as students' perceptions and needs may vary.

Given the findings that emphasise the importance of students feeling socially valued, classroom teachers should be mindful of students' dual desires to fit in and stand out, as these are closely related to school belonging (Grey, 2017). This may be achieved through well-designed structures, experiences, and school policies that encourage both distinctiveness and a sense of community (Grey, 2017). Students from minority groups may hesitate to express divergent opinions for fear of social repercussions. Therefore, schools should aim to foster an environment where differentiation is supported alongside belonging, allowing all students to experience social value (Grey, 2012, 2017).

Moreover, equipping teachers and staff with training and tools to recognise signs of ostracism, rejection, or social exclusion—perhaps through relational approaches such as social networking analysis—may serve as an effective early intervention strategy (Wasserman & Faust, 1994). Additionally, schools should prioritise fostering a sense of belonging not just amongst students, but also amongst staff and families (Allen et al., 2024; Longmuir et al., 2022). Creating a welcoming environment where adults feel valued and accepted can further strengthen the school community.

Last, educational policy makers must recognise that the promotion of school belonging is not just an educational goal but a public health necessity. School belonging has the potential to mitigate or reduce mental health issues during the school years but also reduce the risk of such problems in adulthood.

Limitations

The ATP is a unique population-based prospective study which has tracked the psychosocial development of young people from infancy to adulthood. Nevertheless, there are important sources of selection, measurement and confounding bias in mature cohort studies that warrant consideration (Sterne et al., 2016). Whilst imputation was used to minimise missing data bias in the included sample, it is likely that there has been some selective drop-out of the most vulnerable individuals. Additionally, as all measures are self-report, shared method variance and social desirability bias may be present. Furthermore, the measure of school belonging was taken mid-way through secondary school so we do not know if belonging earlier or later in students' school careers would be equally predictive. Finally, although adjustment for potential confounding variables was carefully conducted, it remains possible that other unmeasured factors (e.g. low academic achievement) that predispose students to experience lower levels of belonging may also predispose them to experience mental health symptoms later in life.

The present research points to the importance of status where students feel socially valued at school for mental health outcomes in adulthood. Urgent attention is now needed to further refine empirical conceptions of school belonging to better understand the role of identity and the associations that experiences like standing out and fitting in (Grey, 2017) during adolescence might have for positive youth development into adulthood. Definitions of school belonging could be further refined to be less about the

grounds, buildings, or the institution itself and more about relationships with teachers and school personnel. Research on school bullying and victimisation provides preliminary evidence for the importance of affirming relationships (e.g. Arslan & Allen, 2021); however, future research could focus on the role of positive experiences with school staff, peers, and others in supporting school belonging.

Conclusion

This study aimed to determine the relationship between multi-faceted school belonging in adolescence and mental health in adulthood in a prospective context. Several findings emerged. First, higher levels of all aspects of school belonging were associated with lower levels of depressive, anxiety and stress symptoms across young adulthood. Second, a student's gender did not appear to materially impact the nature of this relationship, and so, interventions to promote school belonging may be equally effective with male and female students. Third, the feeling of being valued by significant others at school was independently associated with mental health in young adulthood. Hence, when designing school-based interventions to improve young adult mental health, it may be of particular importance to focus on initiatives that specifically aim to improve students' sense of feeling accepted and respected within their school environment.

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Data Availability The ATP study is located at The Royal Children's Hospital Melbourne and is a collaboration between Deakin University, The University of Melbourne, The Australian Institute of Family Studies, The University of New South Wales, The University of Otago (New Zealand), and the Royal Children's Hospital; further information is available at https://www.melbournechildrens.com/atp/. The views expressed in this paper are those of the authors and may not reflect those of their organisational affiliations, nor of other collaborating individuals or organisations. Data collection for the ATP study was supported primarily through Australian grants from the Melbourne Royal Children's Hospital Research Foundation, National Health and Medical Research Council, Australian Research Council, and the Australian Institute of Family Studies.

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