

RESEARCH ARTICLE

The Personal and Contextual Contributors to School Belongingness among Primary School Students

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Abstract

School belongingness has gained currency among educators and school health professionals as an important determinant of adolescent health. The current cross-sectional study presents the 15 most significant personal and contextual factors that collectively explain 66.4% (two-thirds) of the variability in 12-year old students' perceptions of belongingness in primary school. The study is part of a larger longitudinal study investigating the factors associated with student adjustment in the transition from primary to secondary school. The study found that girls and students with disabilities had higher school belongingness scores than boys, and their typically developing counterparts respectively; and explained 2.5% of the variability in school belongingness. The majority (47.1% out of 66.4%) of the variability in school belongingness was explained by student personal factors, such as social acceptance, physical appearance competence, coping skills, and social affiliation motivation; followed by parental expectations (3% out of 66.4%), and school-based factors (13.9% out of 66.4%) such as, classroom involvement, task-goal structure, autonomy provision, cultural pluralism, and absence of bullying. Each of the identified contributors of primary school belongingness can be shaped through interventions, system changes, or policy reforms.

Introduction

Existing literature on school belongingness is fragmented across educational, psychological, health promotion and sociological fields [1]. Various terms such as, identification with school [2], relatedness [3,4], community [5], school membership [6], and connectedness [7] have been used interchangeably to refer to school belongingness. These terms encompass various domains including social experiences of an environment or relationship; feelings or attitude states; and associated behaviours [8–10]. School belongingness in the current study is defined

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as “. . .the extent to which students feel personally accepted, respected, included and supported by others in the school social environment” [11]. Such a conceptualisation of school belongingness extends beyond enrolment at school, to mean that students have established social bonds amongst themselves and with teachers, and perceive the rules governing schools as important and protective [6].

The question of whether an individual’s perception of school belongingness varies as a function of factors such as gender, disability, and household socio-economic status (SES) is compelling because of adverse outcomes (such as mental health problems, dropping out of school) that are associated with school belongingness. Evidence of the influence of student gender [12–15], disability [16,17] and household-SES [18,19] on school belongingness is mixed. Student personal attributes, such as, perceived competence [20–22], coping skills [23], motivational goals for schooling [24–27], and school-related activity participation [2,28–30] have been linked to school belongingness. Family factors such as, parental education and expectations from their child [31], family functioning [32], social support [33,34], and involvement in schooling [35,36] have also been positively associated with school belongingness.

Relationship and classroom management dimensions [27,37–43] have dominated the school belongingness research; with developmental dimensions of the classroom, such as, task-goal orientation [44,45], autonomy-support [42,43], cultural and diversity acceptance, and absence of bullying [46–48] identified as potential determinants. Few studies have considered the combined contribution of personal and contextual factors [49,50], despite the notion that school belongingness is a product of the interaction between the individual and the environment, and considered to be malleable and responsive to features of the school environment. Evidence on the hypothesized relationship between school type (private or public) and school belongingness is unsubstantiated mainly due to measurement issues, with existing population-based investigations inferring low perception of school belongingness from truancy levels, instead of directly measuring the construct [51,52].

Although several studies have focussed on factors associated with school belongingness in secondary school students [14,40,50,53–59]; fewer studies have focussed on the determinants of primary school belongingness [60,61]. Existing evidence, however, suggests that different factors may influence school belongingness at different year levels. Thus, to date, we have a limited understanding on whether factors associated with belongingness in primary school continue to predict belongingness once students transition to secondary school.

In recent years, school belongingness has also gained currency among educators and school health professionals as an important independent determinant of mental health, not only in typically developing adolescents, but also in students with disabilities [1,37,62–67]. School belongingness has also been linked to various educational outcomes, such as, school attendance [68], academic performance [69], and school completion [70]. School belongingness however has mostly been investigated as an antecedent or mediator of student outcomes, and not as an outcome in its own right [54]. This trend has been attributed to societal valuing of discrete outcomes, such as emotional and behavioural health, academic grades, dropping out of school, truancy, or drug use, over psychological attributes such as school belongingness. Given the detrimental effects of adolescents dropping out from school prematurely [65,71], schools and communities face the challenge of not only ensuring that students continue to ‘belong in school’, but also of ‘trying to reconnect’ those who feel disconnected from school [37,72].

The majority of large scale investigations on school belongingness have excluded students with disabilities [65,66] and are limited to school students in the United States of America (US) [1]. More research is needed to substantiate the role of school belongingness in inclusive education practices [73–75], and to validate current research findings in other countries. By

understanding factors associated with school belongingness, education leaders and teachers can facilitate the inclusiveness of school environments.

Drawing on the existing knowledge base, the current study aims to bridge the gap in the literature about the factors associated with primary school belongingness, and present the most influential personal and contextual factors, using a non US sample of primary school students with, and without disability.

Methods

Aims and objectives

The current study describes the most significant personal and contextual contributors of school belongingness, using a sample of 12-year old primary school students, enrolled in the final year of study at mainstream primary schools. The study is part of a larger longitudinal study investigating the factors associated with student adjustment in the transition from primary to secondary school [76,77]. In the current paper, cross-sectional data from 395 students, parents and teachers enrolled in the final year of primary school were used. All students were enrolled in a regular school in the educational districts of metropolitan Perth or other major city centres of WA. Students were categorised into the disability group if they were reported by a primary caregiver to have a medical diagnosis or a chronic ill health condition that impacted on their functioning, and attended over 80% of the school hours per week in a regular setting; with support provided as required. Ethics approval was obtained from Curtin University Health Research Ethics Committee in Western Australia (WA) (HR 194/2005). At all times, informed written consent was obtained from school principals, parents, teachers, and written assent was acquired from students.

Data collection procedure

Survey questionnaires were administered to all participants, in the second semester (Terms 3 and 4) of the final year in primary school (classes 6 or 7). Administration guidelines were developed to minimise bias.

Data collection instruments

Tables 1, 2 and 3 present an overview of the instruments used to measure the key factors identified in the literature as being associated with school belongingness, including covariates, student personal factors, and contextual factors (family and school context).

Sample size estimation

Sample size was estimated based on the assumption that there would be approximately 15 independent variables in the final regression model. In order to have power of .90 ($\beta = 0.1$) and α -value of .05 (Type I error), a sample size of 215 was adequate to detect a small to moderate effect size of 0.1 (Sample Size Program: PASS) [78]. A sample size of 69 children with disabilities in the comparison group was adequate to detect a between group effect difference of .47 or larger; when α was at .05 and power set at .8 ($\beta = .2$).

Data Analysis

Analyses were conducted using the Statistical Package for the Social Sciences (SPSS Version 20) and Statistical Analysis System (SAS Version 9.2) software packages. Using the estimation maximization (EM) algorithm and Little's chi-square statistic, the data were found to be missing completely at random, with the probability level set at 0.05 [79,80]. Standard guidelines

Table 1. Overview of covariates and student personal factors considered for inclusion in the school belongingness model.

Factor	Instrument/ main source	Purpose	Rater	No of items or domains and meaning of total score	Psychometric properties (if needed—addition references to substantiate psychometrics if available)
Covariates					
Age Gender Presence/ absence of disability and type of disability	Drawn from the Indicators of Social and Family Functioning Instrument Version-1 (ISAFF) [122] and Australian Bureau of Statistics surveys	Demographic profile of the sample to match the data to normative data	Parent/ Guardian	6-items	
Perceived Competence	Self-Perception Profile for Adolescents [123]. Domains: academic competence; athletic competence; peer acceptance competence, physical appearance competence	Measures student perceived competence in various domains of functioning.	Student	5-domains Higher score = higher competence	Cronbach's α ranges from .78 to .90 in populations of students with learning disability and behavioural disorders [123]. Considerate convergent, discriminant, and construct validity substantiated in equivalent US and Australian samples [124–126]. Discriminant validity among secondary school typically developing students, students with learning disability and behaviour disorders has been substantiated previously [127].
Coping skills	Short form of the Adolescent Coping Scale (ACS) [128]. 3 coping styles: non-productive, problem solving, and reference to others.	Measures the usage and helpfulness of coping strategies in general and specific situations.	Student	3-coping styles: higher score = better coping style.	Cronbach's α ranges from .50 (reference to others) to .66 (non-productive coping). Test-retest reliabilities range from .44 to .84 (Mean r = .69) [128]. Validated in Australian samples [128].
Motivational orientation for schooling	Inventory of School Motivation (ISM) [129,130]. Domains: Task goals: (Mastery) task and effort motivation, Ego goals (Performance): competition and social-power motivation, Social solidarity goals: affiliation and social concern motivation, Extrinsic goals praise and token reward.	Assesses information on the goals students adopt for schooling	Student	8-domains. Higher score = higher related motivation	Cronbach's α ranges from .53 to .81. Adequate content, construct validity and test-reliability substantiated in cross-cultural studies [25,26,130–132]
Expectations for schooling	Personal expectations. Perception of teachers & parent/guardian expectations of schooling [133].	Assesses students expectations for schooling and their perception of their parents' and teacher's expectation.	Student	3-items	Cronbach's α is .91. [133].
Mental health functioning	Strength and Difficulties Questionnaire (SDQ) [27,40]. Domains: emotional, conduct problems, hyperactivity/inattention, and peer relationship scores	Brief screener of children and adolescents' behaviours, emotions and relationships.	Parent/ Guardian	1-domain of overall mental health functioning Higher score = worse mental health functioning (pro-social skills not included in total score)	Cronbach's α ranges from .70–.80 [134]. Adequate discriminate and predictive validity [27,40]. Widely used in clinical populations [135] and with adolescents with intellectual disability [136,137].

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Table 2. Overview of contextual family factors considered in the school belongingness model.

Factor	Instrument/ main source	Purpose	Rater	No of items or domains and meaning of total score	Psychometric properties (if needed —addition references to substantiate psychometrics if available)
Family demographics	Background: Structure, Family income, time spent in paid employment, parents' educational background	Obtains information about the family's demographic factors	Parent/ Guardian	6-items	Adapted from [86,122] [138] (ANZSCO) [139].
Perceived social support from one's family	Multidimensional scale of perceived social support (MSPSS) [140,141]	Measures subjective perceptions of social support adequacy from the family	Student	1-domain Higher score = higher support	Cronbach's α for the total scale is .91. Subscale α = .90 to .95. Test-retest reliability coefficient of .85. Adequate factorial & concurrent validity have been documented [140,141].
Family functioning	Overall general functioning subscale of the McMaster family assessment device (FAD) [32,142]	Measures the perception of "how the family unit works together on essential tasks"	Parent/ Guardian	1-domain Higher score = worse functioning	Cronbach's α for the total scale. 86. 1- week, test-retest reliability = .71 Split-half coefficient = .83 Good construct validity [32,142]
Parental expectations of schooling for child	Expectation of schooling [133]	Rates parental expectations for their child's future success. Options ranged from primary level qualifications through to post-graduate degrees	Parent/ Guardian	1- item	Developed by researcher [133]
Parental involvement in education	Multidimensional assessment of family involvement [143]. Domains: Home-School Communication, Home-Based Involvement, School-Based Involvement	Assesses parental involvement in their child's education	Parent/ Guardian	3-domains Higher score = greater parent involvement	Cronbach's α range from .84 to .91. Validity reported to be adequate [143].

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Table 3. Overview of contextual school and classroom factors and outcomes considered in the school belongingness model.

Factor	Instrument/ main source	Purpose	Rater	No of items or domains and meaning of total score	Psychometric properties (if needed— addition references to substantiate psychometrics if available)
School climate and adequacy of resources	Type of school, services offered by school to address child's needs. Information on the school sector, post code, number of students enrolled in each school, and organisational structure at each school was obtained from Department of Education and Training, WA records.	Obtain demographic details of the school	Parent	5- items	Developed by researcher [144,145]. Cronbach's α is .92.
Student's perception of the classroom environment	The Middle School Classroom Environment Indicator (MSCEI) [146] Subscales: Student cohesiveness, Ease, Autonomy, Task-Orientation, and Involvement subscales Single items on bullying and cultural/disability tolerance [47,48,147,148]	Measures students' perception of the psychosocial features of the classroom environment. The scale is drawn from works of contemporary classroom environment research and the growing body of knowledge on middle schooling [72,149,150]	Student	7-domains Higher score = better classroom environment	Cronbach's α ranges = .63 to .81. Overall factor structure, discriminate validity, and alpha reliability of MSCEI are robust [47,48,147,148].
Parents' perceptions of general invitations for involvement offered by their child's school	Parent Involvement Scale [118]	Measures parents' perceptions of general invitations for involvement offered by their child's school	Parent/ Guardian	1-domain Higher score = higher involvement	Cronbach's α = .78 and construct validity of this measure has been confirmed factor analysis [118].
School belongingness	Psychological Sense of School Membership (PSSM) Goodenew [11,57], Overall total score on 18-items (with a five-point response format)	To measure the degree to which a student feels accepted and included within the school	Student	1-domain Higher score = greater belongingness	Cronbach's α = .80. Test-retest reliability = 0.78 (4-week interval) [151] and .56 and .60 for boys and girls (12-month interval) [64]. The total PSSM scores correlate positively with school success [11,57], lower levels of depression [64], and lower levels of anxiety [72]. PSSM has been shown to discriminate between groups of students predicted to be different in terms of their sense of belonging in school [11].

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recommended by instrument developers were followed to replace missing values in these questionnaires. In cases where guidelines were not available, missing values were replaced using mean value substitution [81]. Only small amounts of data were missing (< 2.5% at scale level), and independent samples *t*-tests confirmed that the profiles of those whose data were missing for various questions were similar to those who responded.

Descriptive statistics were run to summarise the profiles of study participants. In order to test for the effect of clustering of students (i.e., nesting of students in classes within schools) on their school belongingness scores, a Hierarchical Linear Model was fitted using the mixed procedure in SAS.

Pearson correlation coefficients were used to examine associations between independent variables (IV; student personal factors and contextual factors) and the dependent variable (DV; school belongingness score) prior to undertaking regression. Multiple linear regression models were thereafter fitted to describe the relations between the set of IVs (continuous and categorical) and the primary school belongingness score. Traditional regression summarizes the relationship between the DV and IVs by describing the mean of the response for each fixed value of the IV, using a function referred to as the conditional mean of the response [82,83]. Because linear regression exclusively focuses on the conditional mean, it can detract attention away from the properties of the whole distribution and thus fail to identify informative trends in the response distribution. The straightforward assumptions of a linear relationship between IVs and DV, and that the linear relationship increases smoothly across the range of the IVs, were tested by dividing each IV into quartiles [84]. Gender, disability status and household-SES levels were taken as fixed factors and each IV was regressed to the school belongingness score, using General Linear Model Analysis of Variance (ANOVA). In instances where the school belongingness score appeared to vary in a linear fashion across the three or four quartile categories of the IV; the IV was reverted to its original continuous scale. The final presentation of IVs thus varied as a function of whether their marginal mean estimates supported a consistent linear trend across the school belongingness score. Dummy variables were created to represent categorical IVs (personal, family and school contextual factors) incorporated into the regression models.

The assumptions of linear regression were tested by undertaking preliminary screening of the data through examination of residuals; examination of the scatterplot of residuals against predicted values; and testing for multivariate outliers [80]. No obvious pattern to the errors was detected through examination of the residual scatterplots. No multivariate outliers were found in any of the steps [80].

Development of the model of student belongingness in primary school

A three-step process was followed to develop the model of primary school belongingness.

Step 1: Covariates. Linear regression models with interaction terms were fitted to test the influence of gender, disability, and household-SES on students' school belonging scores. Interaction terms were dropped from the model if they were found not to be significant.

Step 2: Covariates + Identification of student personal factors and contextual factors added in each block. The covariates were added in Step 1 and stepwise backwards elimination was undertaken to identify the significant factors ($p < .05$) within student personal, family, and school contexts that were associated with belongingness in primary school.

Step 3: Rating the explanatory power of independent variables. The explanatory power of factors in blocks was assessed on the basis of how much each factor block added to the prediction of school belongingness, over and above that accounted for by the preceding block [85].

The order of entry of blocks into the analysis was:

Block 1: Covariates (gender, disability, and SES);

Block 2: Student personal factors;

Block 3: Family factors; and

Block 4: School and classroom factors.

Output checks from Standard Multiple regression in SPSS that houses the Tolerance, Variance Inflation Factor (VIF) and the Collinearity Diagnostics output suggested multi-collinearity was not a problem [79]. Following convention, a p -value $< .05$ was taken to indicate a statistically significant association in all tests.

Results

Characteristic of the study's sample

Cross-sectional data from 395 students, their parents and primary-school class teachers from 75 different primary schools distributed across metropolitan Perth and other major urban centres of Western Australia were used. Students were on average 11.89 years ($SD = 0.45$ years, median = 12 years). Boys constituted 47.3% ($n = 187$) of the sample and 22% ($n = 87$) were reported by a parent or primary care-giver to have a disability. The predominant disability/chronic health conditions included asthma (18.8%), auditory disability (15.9%), Attention Deficit Hyperactivity Disorder / Attention Deficit Disorders (14.5%), learning disability (11.6%), Autism Spectrum Disorders (10.1%), and cerebral palsy (8.7%). The majority of the students (58%, $n = 224$) were from mid-range SES households; followed by high-SES households (32.1%, $n = 124$) and low-SES families (9.8%, $n = 38$) [86].

Testing the effect of clustering of students in classes on their school belongingness scores

The class-level Intra Class Correlation Coefficient (ICC) for the primary school belongingness was 4% which suggested that the contribution of clustering to the overall variance was small. Based on these findings we can confidently state that for the study's sample, after adjustment for gender, disability, and household-SES, clustering appeared to have minimal effect on the relationships between the student personal factors and school belongingness scores. Hence, further analyses were undertaken at the level of the individual student.

Predictors of primary school belongingness at the level of the individual student

[Table 4](#) displays the unstandardized regression coefficients (B) and standard errors (SE), and the standardized regression coefficients (Beta), and R , R^2 , and adjusted R^2 after entry of all variables. R was significantly different from zero at the end of each step. No significant interactions were found; so, interaction terms were deleted from the final models.

Block 1. Demographic factors including gender, disability and household-SES accounted for 2.5% of the variability in primary school belongingness ($F_{(4, 365)} = 2.32, p = .057$). Girls (Beta = .08, $p = .019$) and students with disability (Beta = .08, $p = .014$) reported higher belongingness than boys, and their typically developing counterparts; respectively. No variability in primary school belongingness due to household-SES was documented.

Table 4. Factors associated with belongingness in primary school (N = 395).

Model	Factor	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	SE				Beta	Lower Bound
Step 1 Covariates								
	(Constant)	3.80	.06		59.08	<.001	3.68	3.94
	Girls	.09	.07	.06	1.21	.228	-.06	.23
	Disability	-.07	.09	-.04	-.78	.438	-.24	.10
	Low-Q SES household	-.08	.13	-.03	-.63	.528	-.33	.17
	High-Q SES household	.18	.08	.12	2.25	.025	.02	.34
	R = .157, R ² = .025 adjusted R ² = .014							
	F [4, 365] = 2.32, p = .057							
Step 2 Covariates + student personal factors								
	(Constant)	3.07	.23		13.19	<.001	2.62	3.53
	Girls	.13	.05	.09	2.44	.015	.06	.24
	Disability	.11	.066	.07	1.73	.085	-.02	.24
	Low-Q SES household	-.02	.09	-.01	-.24	.807	-.20	.16
	High-Q SES household	.01	.06	.00	.10	.921	-.11	.12
	Social acceptance competence ^a	.21	.05	.20	4.36	<.001	.11	.30
	Physical appearance competence ^b	.15	.04	.15	3.54	<.001	.07	.23
	Low-Q cope solve the problem ^c	-.52	.07	-.33	-7.86	<.001	-.65	-.39
	Non-productive coping ^d	-.02	.00	-.29	-7.28	<.001	-.02	-.01
	Affiliation motivation ^e	.14	.03	.20	5.12	<.001	.08	.19
	R ² Change = .471, R = .704, R ² = .495, adjusted R ² = .483, F change for R ² = 67.17, p < .001							
	F [9, 360] = 35.96, p < .001							
Step 3 Covariates + student personal factors + family factors								
	(Constant)	3.03	.23		13.14	<.001	2.58	3.48
	Girls	.11	.05	.08	2.09	.037	.01	.21
	Disability	.15	.07	.09	2.34	.020	.02	.28
	Low-Q SES household	.02	.09	.01	.18	.854	-.16	.19
	High-Q SES household	-.07	.06	-.05	-1.18	.239	-.19	.05
	Social acceptance competence ^a	.18	.05	.18	3.83	<.001	.09	.27
	Physical appearance competence ^b	.15	.04	.15	3.59	<.001	.07	.23
	Low-Q cope solve the problem ^c	-.49	.06	-.32	-7.68	<.001	-.62	-.37
	Non-productive coping ^d	-.02	.00	-.27	-7.16	<.001	-.02	-.01
	Affiliation motivation ^e	.15	.03	.21	5.58	<.001	.10	.20
	Trade Vs University expectations for child ^f	.22	.06	.16	3.88	<.001	.11	.33
	Low-Q school-based involvement by parent ^g	-.15	.06	-.10	-2.50	.013	-.27	-.03
	R ² Change = .030, R = .725, R ² = .525, adjusted R ² = .510, F change for R ² = 11.12, p < .001							
	F [11, 358] = 39.282, p < .001							

(Continued)

Table 4. (Continued)

Model	Factor	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	SE				Lower Bound	Upper Bound
Step 4 Covariates + student personal factors + family factors + school and classroom factors								
	(Constant)	1.74	.26		6.64	<.001	1.22	2.25
	Girls	.11	.05	.08	2.36	.019	.019	.19
	Disability	.14	.06	.08	2.47	.014	.03	.25
	Low-Q SES household	.01	.08	.00	.10	.920	-.14	.16
	High-Q SES household	-.05	.05	-.03	-.99	.323	-.15	.05
	Social acceptance competence ^a	.13	.04	.13	3.30	<.001	.05	.21
	Physical appearance competence ^b	.10	.04	.10	2.84	.005	.03	.17
	Low-Q cope solve the problem ^c	-.24	.06	-.16	-4.09	<.001	-.36	-.13
	Non-productive coping ^d	-.01	.00	-.22	-6.41	<.001	-.02	-.01
	Affiliation motivation ^e	.11	.02	.15	4.57	<.001	.06	.15
	Trade Vs University expectations for child ^f	.14	.05	.10	2.75	.006	.04	.23
	Low-Q school-based involvement by parent ^g	-.14	.05	-.09	-2.66	.008	-.24	-.04
	Classroom involvement ^h	.17	.04	.17	4.08	<.001	.09	.25
	Low-Q task goal orientation ⁱ	-.16	.06	-.11	-2.75	.006	-.27	-.05
	Autonomy provision ^l	.10	.04	.11	2.78	.006	.03	.17
	Low-Q parental invitation for involvement ^k	-.11	.05	-.07	-2.14	.033	-.20	-.01
	Cultural pluralism ^l	.17	.04	.17	4.73	<.001	.10	.24
	Disagree Vs Agree to being bullied ^m	-.15	.05	-.10	-2.99	.003	-.24	-.05
	R ² Change = .139, R = .815, R ² = .664, adjusted R ² = .648, F change for R ² = 24.29, p < .001							
	F [17, 352] = 40.93, p < .001							

NOTE: Social acceptance competence^a and Physical appearance competence^b measured using the Self-Perception Profile for Adolescents [123]; Low-Q cope solve the problem^c and Non-productive coping^d—measured using the Short form of the Adolescent Coping Scale (ACS) [128]; Affiliation motivation^e—measured using the Inventory of School Motivation (ISM) [129,130]; Trade Vs University expectations for child^f—measured using the Expectation of schooling scale [133]; Low-Q school-based involvement by parent^g and Low-Q parental invitation for involvement^k measured using the Multidimensional assessment of family involvement [143]; Low-Q task goal orientationⁱ, Autonomy provision^l, Cultural pluralism^l, Disagree Vs Agree to being bullied^m—measured using the Middle School Classroom Environment Indicator (MSCEI) [146]. Where variables are prefixed by 'Low-Q' or 'High-Q' this refers to the low or high quartile of the distribution (as described in the Methods).

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Block 2. The addition of student personal factors enabled the model to explain 49.5% of the variability in school belongingness. The increment in the model's predictive power was significant (R^2 change = .471, F statistic for R^2 change = 67.17, $p < .001$).

Five student personal attributes significantly contributed to the primary school belongingness model. Higher belongingness was associated with concurrent high levels of social acceptance competence (Beta = .13, $p = .001$), low physical appearance competence (Beta = .10, $p = .005$), and high social affiliation motivational goal orientation (Beta = .15, $p < .001$). The use of low-levels of problem-solving coping skills relative to the average problem-solving group (Beta = -.16, $p < .001$), and frequent use of non-productive coping strategies (such as, worrying, ignoring the problem at hand, and self-blame) (Beta = -.22, $p < .001$) was associated with lower school belongingness. Students' perceptions of scholastic competence, the pursuit of academic goals for schooling, and their mental health functioning did not influence their school belongingness scores.

Block 3. With the addition of family factors in Block 3, the model's predictive power increased to 52.5% (R^2 change = .030, F statistic for R^2 change = 11.12, $p < .001$). Students whose parents reported low school-based involvement (Beta = -.09, $p = .008$) were less likely to feel they belonged in school, while those whose parents expected them to secure a university degree were more likely to feel belongingness (Beta = .10, $p = .006$). Other parent factors, such as social support and parental self-efficacy did not significantly contribute to the model of school belongingness.

Block 4. School and classroom factors when added in Block 4, enabled the model to explain 66.4% of the variance in school belongingness (R^2 change = .139, F statistic for R^2 change = 24.29, $p < .001$). Students who perceived their classroom to have low level task-goal structure (Beta = -.11, $p = .006$) were less likely to belong when compared to their counterparts who reported average level task-goal structure. Positive associations were found between school belongingness and involvement in classroom activities (Beta = .17, $p < .001$); and belongingness to highly autonomous (Beta = .11, $p = .006$) and culturally pluralistic classroom environments (Beta = .17, $p < .001$). Students were less likely to feel belongingness if their parents reported that their teachers extended low invitations for parental involvement in their schooling (Beta = -.07, $p = .033$). Students who reported being bullied in primary school also reported lower concurrent school belongingness (Beta = -.10, $p = .003$).

Discussion

The current study presents the 15 most significant student personal and contextual factors that explain two-thirds (66.4%) of the variability in 12-year old students' perceptions of belongingness in primary school. Demographic variables, including gender and disability accounted for 2.5% of the variability in student belongingness. Student personal attributes explained the majority of the variability in school belongingness (47.1 out of 66.4%) followed by school factors (13.9%), and family factors (3 out of 66.4%).

Students who perceived themselves to be socially accepted by their peers, and adopted social affiliation goals for schooling had higher belongingness scores [25,26]. We draw on competence theories to explain these findings. Competence theorists would argue that an individual's perception of competence is a result of success in an achievement context [22,87]. People gravitate to domains in which they perceive self-competence and avoid domains/activities with which they do not have a sense of accomplishment. Research suggests that those with low social acceptance competence are more likely to avoid peers, and consequently experience further rejection and less attachment to school [88–90]. Students who perceive themselves to be poorly socially accepted by their peers may also have poorer social and communication skills, and

hence find it difficult to belong to a peer group [91–93]. Not being associated with a peer group could damage the individual's perception of interpersonal competence further [94], which in turn could perpetuate lower perception of school belongingness.

To conclude that school belongingness is mainly dependent on personal attributes and abilities would, however, disregard the fact that the personal factors explaining school belongingness, i.e.; social acceptance, social affiliation motivation, perception of physical appearance, problem solving skills and coping strategies, can all be influenced by how well the school environment satisfies the student's need for belongingness [95]. Previous studies show that perceived acceptance from peers enhances the student's motivation to pursue pro-social goals; and that this is more likely to occur in school settings that encourage supportive relationships among students [95]. Furthermore, teachers' interactions with students tend to influence the students' views of each other. Hence, the results from the current study support the suggestion that classroom strategies that allow for numerous and positive interactions between teachers and students, and among students, can be useful mechanisms for fostering school belongingness [14]. Consistent with the findings of others [96–98], we found positive associations between physical appearance competence and school belongingness. This may indicate that an accepting school environment that addresses negative ideals of body image and creates a culture wherein an individual's strength and character are valued, can foster a sense of belonging amongst its students [99].

Our findings substantiate past works on the unfavourable associations of non-productive coping strategies on student adjustment [100–102]. Primary school students who use non-productive coping strategies (e.g., worrying, ignoring the problem at hand, self-blame), and low levels of problem-solving coping strategies (e.g., working at a problem while remaining optimistic) were shown to be less likely to sense belonging in school. These findings highlight the need for primary schools to not only provide students with opportunities to problem-solve, but also to support those who display non-productive coping strategies. While infrequent use of problem-solving coping was detrimental to school belongingness, frequent use of problem-solving coping was not any more beneficial than average use. This could mean that there could be a threshold level, beyond which the add-on benefits of problem-solving coping on school belongingness are insignificant. Further research into this area is needed.

In the current study we found that girls reported higher school belonging scores than boys. This finding concurs with earlier investigations that report associations between gender, and ability of the student and teachers' predilections [95]. The consistent reporting of higher school belonging in girls may be a signpost for teachers to reflect on how they interact with the boys in the classroom [95].

Several aspects of the classroom environment including task-goal structure; opportunities for student autonomy; classroom involvement; cultural pluralism; safety, and anti-bullying were each found to be significantly associated with school belongingness. The central role played by classroom task-goal structure and student autonomy warrants elaboration, especially in light of current evidence of the effects of reduced task-goal orientation and autonomy on student outcomes [103,104]. A non-linear relationship was found between student perception of the task-goal orientation of the classroom and their school belongingness scores. Students in highly structured classrooms did not report any greater belongingness than their peers in average level task-goal structured classrooms. Students' perceptions that their classroom had low task-goal structure were detrimental to their sense of school belongingness. Classroom task-goal structure enhances determination and regulation amongst students by providing them with autonomy, time-management strategies, and choice over their work [1,43,84,105]. Our findings suggest that primary school teachers should use at least moderate level task-goal

structured teaching strategies, have clearly defined classroom structure, well defined expectations, and transparent assignment structure in order to foster belongingness amongst their students.

The level of a student's involvement in classroom activities was also associated with their sense of belongingness. It is likely that involving students in planning and shaping of learning activities in class, promotes autonomy and self-determination [4,43,106], and makes them more likely to abide by the norms and rules of the classroom [14,43]. This means that in order to nurture school belongingness, primary school teachers need to encourage students to discuss ideas in class, ask questions, and collectively solve problems as a group. It could be hypothesised that class room practices are dependent of the perceived school climate. It has been shown that a democratic school climate has greater impact on students' belongingness than structural characteristics such as the size of the school, facilities and if the school is a private or public school [107]. A democratic school climate may allow for teachers to implement more of collaborative teaching strategies which in turn would result in more interactions between students, further enhancing school belongingness [95]. However, a democratic school climate should be evident also outside the classroom and create a school structure in which students partake in rulemaking, are allowed to express concerns about the fairness of existing rules and are encouraged to participate in free and open discussions and in organising school events.

Students who reported to be bullied in primary school also had lower belongingness scores when compared to their peers who were not bullied. This finding is a cause for concern; especially in light of the wealth of longitudinal research on the detrimental effects of bullying on the individual's mental health and wellbeing [108]. The current study's findings support the implementation of whole-of-school bullying interventions from an early age, much before students reach the final year of primary school [109].

An unexpected finding was the higher school belongingness scores in the subgroup of students with a disability. This finding is in contrast to a previous study [16], and suggests that students with mild disabilities report similar school belongingness levels as their typically developing peers, despite having lower grades and behavioural vulnerability. The higher belongingness scores among students with a disability in our study could be a result of selection bias, i.e., inclusion into the study was restricted to students who attended regular classes for 80% of the school hours [110]. Furthermore, students with mild cognitive impairments reportedly have a bias towards choosing the most positive response option when presented with a Likert-type rating scale [111]. The risk of a positive bias is increased if the scale relates to subjective issues, as in the case of the measurement scales used in our study [112]. These results should therefore be interpreted with appropriate caution.

No variability in school belongingness due to household-SES was found. This finding differs from past US investigations that have reported positive associations between school disengagement (and lack of belongingness) and economic disadvantage among middle and older adolescents [15,19,113,114]. The absence of any moderating effect of household-SES on school belongingness could mean that in primary school, one's social standing is neither beneficial, nor detrimental to perceived school belongingness. This could also be a measurement effect (i.e., small size of lower household-SES group which could have made detection of between-group differences difficult) or a function of the study context (Australia Vs. US). Nonetheless, the current study's results warrant longitudinal investigations that track students along the educational continuum, to determine whether there is a cut-off point at which the effects of social disadvantage on school belongingness emerge.

The current study's findings also endorse the role of parents in early adolescence [115]. Similar to the findings of others [27,104], students in the current study were less likely to sense school belonging if their parents reported low-level involvement in their school-based activities

(e.g., infrequent volunteering in classrooms and infrequent escorting children on trips), and had low scholastic expectations (i.e., did not expect them to go to university). Theorists would argue that parental endorsement of scholastic expectations and involvement in their child's schooling are a form of social capital conducive for membership to the school setting [35,116–118]. However, parents' involvement is also dependent on them feeling invited to participate in school matters; hence, the school has a responsibility to make parents feel a welcome part of the school community.

It is noteworthy that in the multivariate model; structural attributes of the school, such as mean school SES, sector, and organisational model of schooling, each failed to influence the students' school belongingness scores. The absence of any significant association between school structural attributes and 12-year old Australian students' perceptions of school belongingness could be a function of context, student age, or over-inclusion of students from higher SES backgrounds. Nonetheless, it is reassuring that factors amenable to change across the classroom setting have a more potent influence on 12-year old Australian students' sense of school belonging than intractable physical attributes that are often difficult to change [56].

Limitations

There were several methodological issues that impact of the rigor of this study, all of which have been discussed in a previous publication [110]. The study sample was drawn from metropolitan Perth and other major urban centres across Western Australia. Students from other regional, and remote populations, or other major metropolitan cities in Australia were not part of the sample; which limits the generalisability of the study's findings. Despite extensive recruitment efforts, 70% of the schools declined to participate in the study, which may have introduced a possible bias. The composition of the study's cohort included 29% from Catholic Education schools, 47% from public (government) schools, and 24% from independent (non-government) schools. This composition is different to the profiles of students in primary schools across these education systems in Western Australia (15% Catholic Education, 72% public, and 13% independent schools respectively).

Also, only personal development dimensions of the classroom environment, such as goal structure, disciplinary and autonomy provision were considered in our statistical model [43–45,119,120]. To avoid circularity, we did not consider the influence of teacher support and classroom relationship dimensions such as cohesiveness and affiliation on school belongingness, as we considered these to also be components of school belongingness [14,27,54,121]. Inclusion into the disability sub-group was restricted to caregiver report; with students reported to be enrolled in a mainstream class for 80% of their week considered for inclusion. This means that the ability to generalise the findings of the current study to students with more severe disabilities may be limited. Also, the confounding effect of disability severity and comorbidity status on school belongingness was not accessed. Replication of the study findings in students from more diverse school settings (i.e., educational support units, separate schools) is needed.

Given the quantitative nature of the study's design, we did not explore how students with a disability conceptualised school belongingness, and whether their perception differed from that of their typically developing peers. The cross-sectional nature of the data presented in this study means that no causality can be determined. From a methodological standpoint, there may be models with other predictors as plausible as the ones we have presented.

Opportunities

It is encouraging that each of the influences we identified can be shaped by educators through implementation of whole-of-school and classroom-based interventions, and policy reforms in the various education systems.

Author Contributions

Conceived and designed the experiments: SV TF MF AEP. Performed the experiments: SV. Analyzed the data: SV RP. Contributed reagents/materials/analysis tools: SV AEP. Wrote the paper: SV MF MC TF RP TT. Critically reviewed the submission: MF TF MC.

References

1. Blum RW, Libbey HP (2004) Wingspread Declaration on School Connections. *Journal of School Health* 74: 233. PMID: [15493700](#)
2. Finn M (1989) Withdrawing from school. *Review of Educational Research* 59: 117–142.
3. Deci EL, Vallerland RJ, Pelletier LG, Ryan RM (1991) Motivation and education: The self-determination perspective. *Educational Psychologist* 26: 325–346.
4. Connell JP (1990) Context, self, and action: A motivational analysis of self-system processes across life-span. In: Cicchetti D, Beeghly M, editors. *The self in transition: infancy to childhood*. Chicago: The University of Chicago Press.
5. Battistich V, Solomon D, Watson M, Schaps E (1997) Caring school communities. *Educational Psychologist* 32: 137–151.
6. Wehlage G, Rutter R, Smith G, Lesko N, Fernandez R (1989) *Reducing the risk: Schools as communities of support*. Philadelphia: Farmer Press.
7. Eccles JS, Early D, Frasier K, Belansky E, McCarthy K (1997) The relation of connection, regulation, and support for autonomy to adolescents' functioning. *Journal of Adolescent Research* 12: 263–286.
8. Barber BK, Schluterman JM (2008) Connectedness in the Lives of Children and Adolescents: A Call for Greater Conceptual Clarity. *Journal of Adolescent Health* 43: 209–216. doi: [10.1016/j.jadohealth.2008.01.012](#) PMID: [18710674](#)
9. Johnson SL (2009) Improving the school environment to reduce school violence: A review of the literature. *Journal of School Health* 79: 451–465. doi: [10.1111/j.1746-1561.2009.00435.x](#) PMID: [19751307](#)
10. Libbey HP (2004) Measuring Student Relationships to School: Attachment, Bonding, Connectedness, and Engagement. *Journal of School Health* 74: 274–283. PMID: [15493704](#)
11. Goodenow C (1993) The psychological sense of school membership among adolescents: Scale development and educational correlates. *Psychology in the Schools* 30: 79–90.
12. Anderman EM (2002) School effects on psychological outcomes during adolescence. *Journal of Educational Psychology* 94: 795–808.
13. Woolley M, Bowen G (2007) In the context of risk: Supportive adults and the school engagement of middle school students. *Family Relations* 56: 92–104.
14. Osterman KF (2000) Students' need for belonging in the school community. *Review of Educational Research* 70: 323–367.
15. Rumberger RW, Ghatak R, Poulas G, Ritter PL, Dornbusch SM (1990) Family influences on dropout behaviour in one California high school. *Sociology of Education* 63: 283–299.
16. Hagborg WJ (2001) School membership and middle school-age students with a learning disability Poster presented at the National Association of School Psychologists. Washington, D.C.
17. Williams LJ, Downing JE (1998) Membership and belonging in inclusive classrooms: What do middle school students have to say? *Journal of the Association for Persons with Severe Handicaps* 23: 98–110.
18. Alexander KJ, Entwisle DR, Olson L (2001) Schools, achievement, and inequality: A seasonal perspective. *Educational Evaluation and Policy Analysis* 23: 171–191.
19. Lamb S, Walstab A, Teese R, Vickers M, R. R (2004) *Staying on at school: Improving student retention in Australia*. Brisbane: Queensland Department of Education and the Arts.
20. Cooley CH (1902) *Human nature and the social order*. New York Schocken Books.

21. Cowen EL (1994) The enhancement of psychological wellness: Challenges and opportunities. *American Journal of Community Psychology* 22: 149–179. PMID: [7977176](#)
22. Harter S (1999) *The construction of self: A developmental perspective*. New York: Guilford.
23. Hammer AL, Marting MS (1998) *Manual for the coping resources inventory*. Palo Alto, CA: Consulting Psychologists Press.
24. Pintrich PR (2000) An achievement goal theory perspective on issues in motivation terminology, theory and research. *Contemporary Educational Psychology* 25: 92–104. PMID: [10620384](#)
25. McInerney DM, Simpson KB, Dowson M (2003) Adolescent perceptions of the psychological environment of the school: A longitudinal study. In: Pajares F, Urdan TC, editors. *Adolescent Motivation*. New York: New Age Publishing Inc. pp. 25–43.
26. McInerney DM, Marsh HW, Yeung AS (2003) Toward a hierarchical goal theory model of school motivation. *Journal of Applied Measurement* 4: 335–357. PMID: [14523254](#)
27. Goodenow C (1993) Classroom belonging among early adolescent students: Relationships to motivation and achievement. *Journal of Early Adolescence* 13: 21–43.
28. Youniss J, Yates M, Su Y (1997) Social integration: Community service and marijuana use in high school seniors. *Journal of Adolescent Research* 12: 245–262.
29. Youniss J, McLellan JA, Su Y, Yates M (1999) The role of community service in identity development: Normative, unconventional, and deviant orientations. *Journal of Adolescent Research* 14: 248–261.
30. Larson RW (2000) Towards a psychology of positive youth development *American Psychologist* 55: 170–183. PMID: [11392861](#)
31. Entwisle DR, Baker DP (1983) Gender and young children's expectations for performance in arithmetic. *Developmental Psychology* 19: 200–209.
32. Byles J, Byrne C, Boyle MH, Offord D (1988) Ontario child health study: Reliability and validity of the general functioning subscale of the McMaster family assessment device. *Family Process* 27: 97–104. PMID: [3360100](#)
33. Ungar M (2004) The importance of parents and other caregivers to the resilience of high—risk adolescents. *Family Process* 43: 23–41. PMID: [15359713](#)
34. Wentzel KR (1998) Social relationships and motivation in middle school: The role of parents, teachers, and peers. *Journal of Educational Psychology* 90: 202–209.
35. McNeal RB (1999) Parental involvement as social capital: Differential effectiveness on science achievement, truancy and dropping out. *Social Forces* 78: 117–134.
36. Jeynes WH (2005) A meta-analysis of the relation of parental involvement to urban elementary school student academic achievements. *Urban Education* 40: 237–269.
37. Blum RW (2005) A case for school connectedness. *Educational Leadership* 62: 16–20.
38. Blum RW, Libbey HP (2004) Executive Summary: School Connectedness—Strengthening Health and Education Outcomes for Teenagers. *Journal of School Health* 74: 231.
39. McNeely CA, Nonnemaker JM, Blum RW (2002) Promoting school connectedness: Evidence from the national longitudinal study of adolescent health. *Journal of School Health* 72: 138–146. PMID: [12029810](#)
40. Goodenow C, Grady KE (1993) The relationship of school belonging and friends' values to academic motivation among urban adolescent students. *Journal of Experimental Education* 62: 60–71.
41. Wentzel KR, McNamara CC (1999) Interpersonal relationships, emotional distress, and pro-social behaviour in middle school. *The Journal of Early Adolescence* 19: 114–125.
42. Hardre PL, Reeve J (2003) A motivational model of rural students' intentions to persist in, versus drop out of, high school. *Journal of Educational Psychology* 95: 347–356.
43. Ryan RM, Deci EL (2002) An overview of self-determination theory: An organismic dialectical perspective. In: Deci EL, Ryan RM, editors. *Handbook of Self-Determination Research*. Rochester: University of Rochester Press.
44. Ames C (1992) Achievement goals and the classroom climate. In: Schunk DH, Meece JL, editors. *Student Perceptions in the Classroom*. Hillsdale, NJ: Erlbaum pp. 327–348.
45. Elliott ES, Dweck CS (1998) Goals: An approach to motivation and achievement. *Journal of Personality Assessment* 54.
46. Felner RD, Felner TY (1989) Primary prevention programs in an ecological context: A transactional-ecological framework and analysis. In: Bond L, Compas B, editors. *Primary prevention in the schools*. Beverly Hills, CA: Sage. pp. 13–48.
47. Gottfredson GD, Gottfredson DC (1985) *Victimization in schools*. New York: Plenum Press.

48. Rigby K (2002) New perspectives on bullying. London: Jessica Kingsley.
49. Faircloth BS, Hamm JV (2005) Sense of belonging among high school students representing 4 ethnic groups. *Journal of Youth and Adolescence* 34: 292–309.
50. Nichols SL (2008) An Exploration of Students' Belongingness Beliefs in One Middle School. *The Journal of Experimental Education*, 76: 145–169.
51. Organisation for Economic Co-operation and Development [OECD] (2003) School factors related to quality and equity: Results from PISA 2000. Paris: OECD.
52. Gorard S (2006) The true impact of school diversity? In: Hewlett M, Pring R, Tulloch M, editors. *Comprehensive education: evolution, achievement and new directions*. Northampton: University of Northampton Press.
53. Anderman LH (2003) Academic and social perceptions as predictors of change in middle school students' sense of school belonging. *Journal of Experimental Education* 72: 5–22.
54. Anderman LH, Freeman TM (2004) Students' sense of belonging in school. In: Pintrich PR, Maehr ML, editors. *Motivating students, improving schools: The legacy of Carol Midgley*. Oxford, UK: Elsevier, Ltd. pp. 27–63.
55. Faircloth BS, Hamm JV (2005) Sense of Belonging Among High School Students Representing 4 Ethnic Groups. *Journal of Youth and Adolescence* 34: 293–309.
56. Ma X (2003) Sense of Belonging to School: Can Schools Make a Difference? *The Journal of Educational Research* 96: 340–349.
57. McMahon SD, Parnes AL, Keys CB, J. J. V (2008) School belonging among low-income urban youth with disabilities. *Psychology in the Schools* 45: 26–47.
58. Roeser RW, Midgley C, Urdan TC (1996) Perceptions of the psychological environment and early adolescents' psychological and behavioural functioning in school: The mediating role of goals and belonging. *Journal of Educational Psychology* 88: 408–422.
59. Roeser RW, Midgley C, Urdan TC (1996) Perceptions of the psychological environment and early adolescents' psychological and behavioral functioning in school: The mediating role of goals and belonging. *Journal of Educational Psychology* 88: 408–422.
60. Furrer CJ, Skinner EA (2003) A sense of relatedness as a factor in children's academic engagement and performance. *Journal of Educational Psychology* 95.
61. Morrison GM, Cosden MA, O'Farrell SL, Campos E (2003) Changes in Latino students' perceptions of school belonging over time: Impact of language proficiency, self-perceptions and teacher evaluations. *The California School Psychologist* 8.
62. Jacobson KC, Rowe DC (1999) Genetic and environmental influences on the relationship between family connectedness, school connectedness and adolescent depressed mood: Sex differences. *Developmental Psychology* 35: 926–939. PMID: [10442862](#)
63. Kuperminc GP, Leadbeater BJ, Blatt SJ (2001) School Social Climate and Individual Differences in Vulnerability to Psychopathology among Middle School Students. *Journal of School Psychology* 39: 141–159.
64. Shochet IM, Dadds MR, Ham D, Montague R (2006) School Connectedness Is an Underemphasized Parameter in Adolescent Mental Health: Results of a Community Prediction Study. *Journal of Clinical Child & Adolescent Psychology* 35: 170–179.
65. Resnick M, Bearman P, Blum RW, Bauman KE, Harris K, Jones J, et al. (1997) Protecting adolescents from harm: Findings from the National Longitudinal Study on Adolescent Health. *JAMA* 278: 823–832. PMID: [9293990](#)
66. Catalano RF, Oesterle S, Fleming CB, Hawkins JD (2004) The Importance of Bonding to School for Healthy Development: Findings from the Social Development Research Group. *Journal of School Health* 74: 252–261. PMID: [15493702](#)
67. Vaz S, Falkmer M, Parsons R, Passmore AE, Falkmer T (2014) The personal and contextual contributors of school belongingness in primary students. *PLOS ONE*.
68. Rosenfeld LB, Richman JM, Bowen GL (1998) Low social support among at-risk adolescents. 20: 245–260.
69. Barber BK, Olsen JA (1997) Socialization in context: Connection, regulation, and autonomy in the family, school, and neighbourhood and with peers. *Journal of Adolescent Research* 12: 287–315.
70. Bond L, Butler H, Thomas L, Carlin J, Grover S, Bowes G, et al. (2007) Social and school connectedness in early secondary school as predictors of late teenage substance use, mental health, and academic outcomes. *Journal of Adolescent Health* e9–e18.
71. Black R (2007) Engaging students in school: An education foundation Australia fact sheet. Education Foundation Australia.

72. Hargreaves A, Earl L, Ryan J (1996) *Schooling for change: Reinventing education for early adolescents*. London: The Falmer Press.
73. Warnock M (2005) *Special Educational Needs: A new outlook*. London: Philosophy of Education Society of Great Britain.
74. Billingsley F, Gallucci C, Peck C, Schwartz I, Staub D (1996) But those kids can't even do math: An alternative conceptualization of outcomes for inclusive education. *Special Education Leadership Review* 3: 43–55.
75. Frederickson N, Simmonds E, Evans L, Soulsby C (2007) Assessing the social and affective outcomes of inclusion. *British Journal of Special Education* 34: 105–115.
76. Vaz S (2010) Factors affecting student adjustment as they transition from primary to secondary school: A longitudinal investigation. Perth: Curtin University.
77. Vaz S, Parsons R, Falkmer T, Passmore AE, Falkmer M (2014) The Impact of Personal Background and School Contextual Factors on Academic Competence and Mental Health Functioning across the Primary-Secondary School Transition. *PloS one* 9: e89874. doi: [10.1371/journal.pone.0089874](https://doi.org/10.1371/journal.pone.0089874) PMID: [24608366](https://pubmed.ncbi.nlm.nih.gov/24608366/)
78. NCSS (1996) *PASS 6.0 user's guide*. Kaysville, UT: NCSS.
79. Meyers LS, Gamst G, Guarino AJ (2006) *Applied multivariate research: Design and implication*. CA: Sage Publications, Inc..
80. Tabachnick B, Fidell L (2007) *Using multivariate statistics*. Boston, MA: Pearson Education Inc. and Allyn & Bacon.
81. McKnight P, McKnight K, Sidani S, Figueredo A (2007) *Missing data: A gentle introduction*. New York: Guilford.
82. Koenker R, Hallock K (2001) Quantile Regression: An Introduction. *Journal of Economic Perspectives* 15: 143–156.
83. Despa S (2007) *StatNews #70: Quantile regression*. Cornell Statistical Consulting Unit.
84. Field AP (2006) *Discovering statistics using SPSS: And sex and drugs and rock 'n' roll*. London: Sage.
85. Petrocelli JV (2003) Hierarchical multiple regression in counseling research: Common problems and possible remedies. *Measurement and Evaluation in Counseling and Development* 36: 9–22.
86. Australian Bureau of Statistics [ABS] (2001) *ABS 2001 Census Dictionary (Cat. No. 2901.0)*.
87. Harter S (1983) Developmental perspectives on the self-system. In: Mussen PH, editor. *Handbook of child psychology*. New York: Wiley. pp. 275–385.
88. Parker JG, Asher SR (1993) Friendship and friendship quality in middle childhood: links with peer group acceptance and feelings of loneliness and social dissatisfaction. *Development and Psychology* 29: 611–621.
89. Parkhurst JT, Asher SR (1992) Peer rejection in middle school: Subgroup differences in behaviour, loneliness, and interpersonal concerns. *Developmental Psychology* 28: 231–241.
90. Crick NR, Grotpeter JK, Rockhill C (1999) Social information processing and children's loneliness. In: Rotenberg K, Hymel S, editors. *Children's loneliness*. New York: Cambridge University Press. pp. 153–175.
91. Hartup WW, Sancilio M (1986) Children's friendships. In: Schopler E, Mesibove G, editors. *Social behaviour in autism*. New York: Plenum. pp. 61–80.
92. Buhs ES, Ladd GW (2001) Peer rejection as an antecedent of young children's school adjustment: An examination of mediating processes. *Developmental Psychology* 37: 550–560. PMID: [11444490](https://pubmed.ncbi.nlm.nih.gov/11444490/)
93. Cernkovich SA, Giordano PC (1992) School bonding, race, and delinquency. *Criminology* 30: 261–291.
94. Bukowski WM, Hoza B (1989) Popularity and friendship: Issues in theory, measurement, and outcome. In: Berndt TJ, Ladd GW, editors. *Peer relationships and child development*. New York: Wiley. pp. 15–45.
95. Osterman KF (2000) Students' Need for Belonging in the School Community. *Review of Educational Research* 70: 323–367.
96. Lerner K, Kucher JD, East PL, Lerner JV, Lerner RM (1987) Early adolescents' physical organismic characteristics and psychosocial functioning: Findings from the Pennsylvania early adolescent transition study. In: Lerner RM, Foch TT, editors. *Biological-psychological interactions in adolescence*. Hillsdale, NJ: Erlbaum. pp. 212–239.

97. Harter S (1989) Causes, correlates, and the functional role of global self-worth: A life-span perspective. In: Kolligian J, Sternberg R, editors. *Perceptions of competence and incompetence across the life-span*. New Haven: Yale University Press. pp. 67–100.
98. Marsh HW (1989) Age and sex effects in multiple dimensions of self-concept: Preadolescence to early adulthood. *Journal of Educational Psychology* 81: 417–430.
99. O’Dea J, Abraham SF (2000) Improving the body image, eating attitudes, and behaviours of young male and female adolescents: A new educational approach that focuses on self-esteem. *International Journal of Eating Disorders* 28: 43–57. PMID: [10800013](#)
100. Frydenberg E, Lewis R (1999) Academic and general wellbeing: The relationship with coping. *Australian Journal of Guidance & Counselling* 9: 19–36.
101. Neill L (1996) Ethnicity, gender, self-esteem and coping styles: A comparison of Australian and South-East Asian adolescents. Graduate Diploma of Counselling Psychology Project. Melbourne Royal Melbourne Institute of Technology.
102. Lodge J, Frydenberg E, Care E, Tobin M, Begg B (2007) Enhancing wellbeing and learning in middle years classrooms. ARC Linkage Project (06/07).
103. Midgley C, Kaplan A, Middleton MJ (2001) Performance-approach goals: Good for what, for whom, under what circumstances, and at what cost? *Journal of Educational Psychology* 93: 77–86.
104. National Research Council (2004) *Engaging Schools: Fostering High School Students’ Motivation to Learn*. Board on Children, Youth, and Families, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.
105. Evertson CM, Harris AH (1992) What we know about managing classrooms. *Educational Leadership* 49: 74–78.
106. Deci LM, Ryan RM (1985) *Intrinsic motivation and self-determination in human behaviour*. New York: Plenum.
107. Vieno A, Perkins D, Smith T, Santinello M (2005) Democratic School Climate and Sense of Community in School: A Multilevel Analysis. *American Journal of Community Psychology* 36: 327–341. PMID: [16389503](#)
108. Rigby K (2003) Consequences of bullying in schools. *Canadian Journal of Psychiatry* 48: 583–590. PMID: [14631878](#)
109. Cross D, Erceg E (2002) *Friendly schools and families*. Perth: Edith Cowan University.
110. Vaz S, Parsons R, Falkmer T, Passmore AE, Falkmer M (2014) The impact of personal background and school contextual factors on academic competence and mental health functioning across the primary-secondary school transition. *PLOS ONE*.
111. Hartley SL, MacLean WE (2006) A review of the reliability and validity of Likert-type scales for people with intellectual disability. *Journal of Intellectual Disability Research* 50: 813–827. PMID: [16999781](#)
112. Perkins EA (2007) Self- and Proxy Reports Across Three Populations: Older Adults, Persons With Alzheimer’s Disease, and Persons With Intellectual Disabilities. *Journal of Policy and Practice in Intellectual Disabilities* 4: 1–10.
113. Lamb S, Dwyer P, Wyn J (2000) *Noncompletion of school in Australia: The changing patterns of participation and outcomes*. Camberwell, Victoria: ACER.
114. Fullarton S, Walker M, Ainley J, Hillman K (2003) *Patterns of participation in Year 12*. Camberwell, Victoria: ACER.
115. Ungar M (2004) The importance of parents and other caregivers to the resilience of high-risk adolescents. *Family Process* 43: 23–41. PMID: [15359713](#)
116. Coleman JS (1988) Social capital in the creation of human capital. *American journal of Sociology* 94: S95–S120.
117. Hoover-Dempsey KV, Sandler HM (1997) Why do parents become involved in their children’s education? *Review of Educational Research* 67.
118. Walker JMT, Wilkins A, Dallaire J, Sandler HM, Hoover-Dempsey K (2005) Parental Involvement: Model revision through scale development. *The Elementary School Journal* 106: 85–104.
119. Felner RD, Favazza A, Shim M, Brand S, Gu K, Noonan N (2001) Whole school improvement and restructuring as prevention and promotion: Lessons from STEP and the project on high-performance learning communities. *Journal of School Psychology* 39: 177–202.
120. Gottfredson DG, Gottfredson DC, Payne AA, Gottfredson NC (2005) School climate predictors of school disorder: Results from a national study of delinquency prevention in schools. *Journal of Research in Crime and Delinquency* 42: 412–444.
121. Baumeister RF, Leary MR (1995) The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin* 117: 497–529. PMID: [777651](#)

122. Zubrick S, Williams A, Silburn SR, Vimpani G (2000) Indicators of social and family functioning. Canberra: Commonwealth of Australia.
123. Harter S, Whitesell N, Junkin L (1998) Similarities and differences in domain-specific and global self-evaluations of learning disabled, behaviorally disordered, and normally achieving adolescents. *American Educational Research Journal* 35: 653–680.
124. Zubrick S, Silburn SR, Garton A (1993) Field instrument development for the Western Australian child health study. Perth, WA: Western Australian Research Institute for Child Health.
125. Passmore A (1998) The relationship between leisure and mental health in adolescents. Perth University of Western Australia.
126. Harter S (1982) The perceived competence scale for children. *Child Development* 53: 87–97.
127. Harter S, Whitesell NR, Junkin LJ (1998) Similarities and Differences in Domain-Specific and Global Self-Evaluations of Learning-Disabled, Behaviorally Disordered, and Normally Achieving Adolescents. *American Educational Research Journal* 35: 653–680.
128. Frydenberg E, Lewis R (1993) Adolescent coping scale: Administrator's manual. Melbourne, Victoria: ACER.
129. Ali J, McInerney DM (2005) An analysis of the predictive validity of the inventory of school motivation (ISM). AARE 2005 International Educational Conference. Sydney, Australia.
130. McInerney DM, Ali J (2006) Multidimensional and hierarchical assessment of school motivation: Cross-cultural validation. *Educational Psychology* 26: 717–734
131. McInerney DM, Yeung AS, McInerney V (2001) Cross-cultural validation of the inventory of school motivation (ISM): Motivation orientations of Navajo and Anglo students. *Journal Of Applied Psychology* 2: 135–153.
132. Simpson KB, McInerney DM (2004) Adolescent's motivational goals and self-related constructs: A cross sectional study. Paper presented at the 3rd Biennial Conference on SELF Research. Berlin.
133. Gill S, Reynolds A (1999) Educational expectations and school achievement of urban African American children. *Journal of School Psychology* 37: 403–424.
134. Mellor D (2005) Normative data for the strengths and difficulties questionnaire in Australia. *Australian Psychologist* 40: 215–222.
135. Mathai J, Jespersen S, Bourne A, Donegan T, Akinbiyi A, Gray K, et al. (2008) Use of the Strengths and Difficulties Questionnaire in identifying emotional and behavioural problems in children of parents with a mental illness in Australia. *Advances in Mental Health* 7: 200–206.
136. Emerson E (2005) Use of the Strengths and Difficulties Questionnaire to assess the mental health needs of children and adolescents with intellectual disabilities. *Journal of Intellectual and Developmental Disability* 30: 14–23.
137. Kaptein S, Jansen D, Vogels A, Reijneveld S (2008) Mental health problems in children with intellectual disability: use of the Strengths and Difficulties Questionnaire. *Journal of Intellectual Disability Research* 52: 125–131. doi: [10.1111/j.1365-2788.2007.00978.x](https://doi.org/10.1111/j.1365-2788.2007.00978.x) PMID: [18197951](https://pubmed.ncbi.nlm.nih.gov/18197951/)
138. Australian Bureau of Statistics [ABS] (2003) Australian demographic statistics. Cat. No. 3101.0. Canberra: Australian Bureau of Statistics.
139. Australian Bureau of Statistics [ABS] (2006) The Australian and New Zealand standard classification of occupations (ANZSCO) first edition Belconnen, ACT: Commonwealth of Australia.
140. Zimet GD, Dahlem N, Zimet S, Farley GK (1988) The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment* 52: 30–41.
141. Zimet GD, Powell SS, Farley GK, Werkman S, Berkoff KA (1990) Psychometric properties of the Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment* 55: 610–617. PMID: [2280326](https://pubmed.ncbi.nlm.nih.gov/2280326/)
142. Epstein NB, Baldwin LM, Bishop DS (1993) The McMaster family assessment device. *Journal of Marital and Family Therapy* 9: 171–180.
143. Manz PH, Fantuzzo JW, Power T (2004) Multidimensional assessment of family involvement among urban elementary students. *Journal of School Psychology* 42: 461–475.
144. Norman K, Caseau D, Stefanich GP (1998) Teaching students with disabilities in inclusive science classrooms: Survey results. *Science Educational Studies* 82: 127–146.
145. Soodak LC, Podell DM, Lehman LR (1998) Teacher, student, and school attributes as predictors of teachers' responses to inclusion. *The Journal of Special Education* 31: 480–497.
146. Hine P (2001) Classroom environment and the transition to secondary schooling [PhD Thesis]. Perth: Curtin University of Technology. 1–281 p.

147. Pellegrini A, Bartini M (2000) A longitudinal study of bullying, victimization, and peer affiliation during the transition from primary school to middle school. *American Educational Research Journal* 37: 699–725.
148. Felner RD, Aber M, Cauce A, Primavera J (1985) Adaptation and vulnerability in high-risk adolescents: An examination of environmental mediators. *American Journal of Community Psychology* 13: 365–380. PMID: [4050748](#)
149. Cormack P (1996) From alienation to engagement: Opportunities for reform in middle years of schooling: Theoretical constructions. Canberra: Australian Curriculum Studies Association.
150. Hargreaves A (1986) Two cultures of schooling: The case of middle schools. London: Falmer Press.
151. Hagborg WJ (1994) An exploration of school membership among middle- and high-school students. *Journal of Psychoeducational Assessment* 12: 312–323.