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Measuring the impact of students' social relations and values: Validation of the Social-Relational Support for Education instrument

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ABSTRACT

A significant body of literature attests to the influence of social contexts on students' engagement with school. A review of this literature led to the construction of a self-report instrument designed to measure Social-Relational Support for Education (SRSE). The conceptual framework underlying the SRSE instrument focuses on the factors that can potentially boost student engagement: these include young people's relationships with peers, teachers, and parents. Specifically, the SRSE seeks to measure young people's perceptions of the education-related values espoused by those to whom they relate most closely, as well as their sense of belonging at school. The psychometric properties of the SRSE measure are assessed in this paper through examining the congeneric properties of each hypothesised latent factor, confirmatory factor analysis of responses to the full SRSE instrument, and invariance testing. Results indicate strong factor loadings of all items on their respective scales and excellent overall model fit. The SRSE scale presented in this paper provides an essential foundation that will allow a comprehensive examination of the relationships between students' social-relational contexts and their engagement with school.

Key words: retention, engagement, dropout, peer influence, teacher influence, parent influence.

INTRODUCTION

Young people's relationships with their parents, friends, and teachers have a substantial influence on their engagement with school and on their decisions to either drop out or stay on. Evidence from extensive literature reviews indicates that these relationships and the values embedded in them have powerful impacts on student engagement and school completion (Eccles, 2008; Rumberger, 2011). Instruments measuring motivation and engagement, such as the Student Engagement Instrument (Appleton, Christenson, Kim & Reschly, 2006) and the Motivation and Engagement Scale (Martin, 2007) are readily available. However, if the aim is to provide practical support for parents and educators indicating how social-contextual factors might influence student engagement, then the development of a psychometrically sound instrument that measures these contextual factors is an essential first step. The purpose of this paper is, therefore, to report on the construction and validation of a self-report instrument designed to measure Social-Relational Support for Education (SRSE) for secondary students (Years 7 to 9) from schools identified at being in at-risk areas for higher levels of

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school dropouts (as identified by the New South Wales Department of Education and Communities – NSW DEC).

Student engagement and high school completion

Based on their review of engagement literature, Russell, Ainley and Frydenberg (2005) argued that engagement can be described as the *energy* behind an action, and that engagement needs to be distinguished from motivation. Maehr and Mayer (1997) suggest that motivation defines the *direction* of one's actions, but not their intensity. In their seminal article, Fredericks, Blumenfeld, and Paris (2004) proposed that engagement can be conceptualised in terms of three dimensions: cognitive, emotional, and behavioural. They argue that behavioural engagement involves participation, attendance, and punctuality, and they described dropping out as an ultimate behavioural manifestation of disengagement. Emotional engagement broadly speaking reflects a sense of belonging at school; it has a weak relationship to achievement but it does influence students' decisions to stay on rather than drop out (Russell et al., 2005).

Finn (1993) argued for the primacy of engagement as a central concept for understanding school dropout. He proposed that the construct of engagement captures the continuous, incremental processes that ultimately lead students to disconnect from school. Based on data from substantial longitudinal studies, he found that there were large, significant differences between school completers and non-completers on engagement behaviours, even after background and psychological characteristics were controlled statistically (Finn & Rock, 1997). Consistent with this position on the salience of engagement, it has been put forward as "the most promising approach for interventions to prevent this phenomenon" (Appleton, Christenson, Kim, & Reschly, 2006, p. 427), and according to the National Research Council and Institute of Medicine (2003) it plays a central role in high school reform efforts across the United States.

When investigating how the multidimensional nature of engagement impacts dropout, Archaumbault, Janosz, Fallu, and Pagani (2009) found that while global engagement directly predicted early high school dropout, only behavioural engagement contributed significantly; whereas cognitive and affective engagement did not. In addition, a comprehensive review of literature investigating definitions, measures, precursors, and outcomes of engagement, Fredricks and colleagues (2004) concluded that further research investigating the sources of engagement, how it relates to context, and the impact of conditional changes on engagement is needed to determine whether the role of engagement is a potential mediator as opposed to simply a direct determinant of outcome measures (including early high school dropout). They further suggest it is necessary to study the multidimensional nature of engagement, preferably longitudinally, in order to help determine this.

Over the past three decades, numerous large-scale longitudinal and cross-sectional research projects have mapped the relationships between disengagement from school and the demographic, institutional, and individual factors that contribute to it. Extensive reviews of this literature (e.g., Lamb, Walstab, Teese, Vickers, & Rumberger, 2004; Rumberger, 2011) have also found consistent differences in dropout rates by gender, family socio-economic status (SES), and place of residence. The structural relationships are clear: students from families of low SES are substantially less likely to complete high school than those from families of high SES (e.g. Alexander, Entwisle, & Horsey, 1997; Rosenfeld, Richman, & Bowen, 1998). "Engaging in deviant behavior, bonding to antisocial peers, and coming from a family in poverty increase risk for leaving school early, even when children have not experienced academic difficulties or failure." (Battin-Pearson, Newcomb, Abbott, Hill, Catalano, & Hawkins, 2000, p. X). Moreover, Battin-Pearson and colleagues (2002) conclude that a more comprehensive view of dropout would be achieved with the inclusion of a broader social spectrum of family, school, community, and peers. In seeking to explain exactly what it is about low SES that renders young people liable to disengagement and early leaving, researchers have focused among other things on parental support for school achievement, the quality of teacher-student relationships, peer influences, and the students' sense of belonging within the school setting. The following sections of this paper consider each of these issues in turn. The literature reviewed here provides the foundation for the five-factor SRSE scale presented later in this paper.

Parental support for school engagement

Numerous studies have examined the influence of parental and family factors on student motivation, engagement, and achievement at school. This research covers a range of topics including parents' involvement with the school (Jeynes, 2007), parenting styles (Blondal & Adalbjarnardottir, 2009), parents' expectations, and student motivation (Gonida, Kiosseoglou, & Voulala, 2007), parents' socioeconomic status (Alexander et al., 1997), their education (Gury, 2011), and family structure (Astone & McLanahan, 1991). Relatively few studies have examined the impact children's perceptions of their parent's educational values may have on their academic motivation (a recent study by Gniewosz & Noack, 2012, suggests an emerging interest in this issue).

Most studies focussing on the influence of parents' educational values have used parental self-report measures, examining the relationship between these values and schooling outcomes (Hoover-Dempsey, Walker, & Sandler, 2005). This research indicates that parents who place high value on learning and school are more likely to spend time working with their children on school related tasks (Hoover-Dempsey et al., 2001). While this research suggests that parents' educational values do matter, it overlooks children's perceptions of their parents' views, and therefore fails to explore the processes through which parental values may actually influence young people's behaviour and motivation. Addressing this gap, Gniewosz and Noack (2012) examined adolescents' perceptions of their parents' academic values. Using longitudinal data, the authors found that parents' academic values were passed on to their children through parental involvement with school-related matters. They also found that student perceptions of parental values do play a key role in predicting students' own academic values, and concluded that "… perceptions of parental values and behaviours by the student … serve as gatekeepers of academic socialization" (Gniewosz & Noack, 2012, p. 71). Given the critical role that these perceptions play as a measure of students' perceptions of parental academic values, the SRSE scale has factored these in.

Teacher-student relationships, engagement, and high school completion

Supportive teacher-student relationships have been identified as an important factor reducing the likelihood of students dropping out of school. Croninger and Lee (2001) reported that the likelihood of school dropout appears to be reduced by one half when young people perceived their teachers as caring and showing genuine interest in them. In a more recent study, Vallerand, Fortier, and Guay, (1997) also found that supportive teacher relationships lessen the likelihood that students will drop out of school. Students who perceive teachers to be caring are more likely to be positively oriented toward learning (Rosenfeld, Richman, & Bowen, 2000; Ryan, Stiller, & Lynch, 1994). A relatively recent literature review by Eccles and Roeser (2011) summarises data from several studies which found that students' perceptions of differential treatment by their teachers can have substantial cumulative negative effects on their motivation and achievement.

Studies where contact was made with dropouts after they had left school came to similar conclusions. Upon surveying students entering a second-chance program, Whannell and Allen (2011) found that poor teacher-student relationships contributed strongly to reduced emotional engagement at school and subsequent decisions to leave school before completing Grade 12. When high school drop outs were surveyed by Bridgeland, DiLulio, and Morison (2006), it was found that more than half of the 467 respondents aged 16 to 25 had left school early because they felt teachers had not shown an interest in them. This body of evidence suggests that inclusion of a measure of students' perceptions of the quality of their relationships with teachers is justified for the proposed SRSE scale.

Peer influences and school engagement

Interpersonal relationships play a central role in students' academic motivation and engagement, and hold a key position in theorisations about learning and motivation. Bandura's (1989) social cognitive theory, for example, states that the "most valuable knowledge is imparted socially" (p.9). Deci and Ryan's (2000) self-determination theory proposes that social conditions in which individuals function are central for facilitating intrinsic motivation, social development, and well-being. A substantial body of literature attests to the influence of peer relationships on achievement motivation and engagement.

However, peer-relatedness includes at least three dimensions each of which are discussed below. The first dimension, BELONGING, asks whether the student feels accepted, respected, and included in their school community. The second dimension, FRIENDS, relates to whether the student has good friends at school and gets on well with others. The third dimension, which we call VALUE COHERENCE, focuses on the existence of friendships through which educational values are shared and reinforced.

Belonging

Over the past 20 years a number of studies have examined the influence of students' subjective sense of school belonging on their academic motivation, engagement and participation. Many of these studies have focused on students from categories considered to be at risk of school dropout. For example, in a study of 300 Year 7-9 students, Goodenow and Grady (1993) found strong correlations between measures of school belonging, friends' values, and academic motivation and effort. In a later study, McGaha and Fitzpatrick (2005) also found that young people who felt alienated from school were less satisfied at school and had a greater propensity to drop out.

Summarising a substantial body of literature on this topic, Juvonen (2007) argued that simply having friends does not always lead to a sense of belonging, especially when the friendship group is composed of students who are disengaged academically and are resistant towards their teachers. Rather, belonging arises when academically-engaged students are connected in friendship groups that support respectful relations with teachers. The sense of connectedness to school which follows from this, leads to enhanced academic engagement and greater resilience in the face of transitions though school. While this theorisation of belonging seems quite logical, it does suggest the possibility that 'belonging' as defined by Juvonen (2007), may be functioning as a proxy for some combination of variables such as student friendships together with the values espoused by friends. This possibility is explored through the development of the Value Coherence scale (see below) which is included in the SRSE, alongside other scales that measure peer-friendships and belonging.

Friends

Having friends can play a pivotal role in influencing young people's academic motivation and social behaviour at school (Martin & Dowson, 2009, Sokatch, 2006). Having friends and in particular, high achieving friends, can increase the likelihood of completing high school (Kasen, Cohen, & Brook 1998; Rumberger & Thomas 2000). Having affiliations with anti-social young people, on the other hand, appears to increase the likelihood of not completing school (Battin-Pearson et al., 2000; Vitaro, LaRoque, Janosz, & Tremblay, 2001). Not having friends and being unpopular at school can also contribute to a young person's decision to drop out of school (Hymel, Comfort, Schonert-Reichl, & McDougall, 1996).

A large-scale study by Kim, Gendron, Toro, and Fairborn (2011) highlighted the strength of peer relationships relative to other contextual factors. They compared the strength of individual level factors (motivation), school climate factors (teachers and school grounds), and peer relationships, and found that the most significant predictor of high-school dropout was the quality of students' affiliations with their peers. Young people who affiliate with poorly-behaved students tend to imitate their lifestyles, and this often contributes to increased feelings of alienation (Kortering & Braziel, 1999). In an early but widely cited review article, Parker and Asher (1987) summarised a large body of research looking at children who had difficulties forming and sustaining social ties. In examining the long-term effects of this lack of peer support, they found that students with average and above average intelligence who left school early were more likely to have dropped out as a result of weak or negative relationships with their peers, rather than due to lack of cognitive ability or parental support. Items measuring student friendship (such as 'I have lots of friends at school') have, therefore, been included in the SRSE scale.

Value Coherence

The title given to the Value Coherence dimension of the SRSE was inspired by Martin Buber's (1958) influential philosophical essay, in which I-Thou relationships (which involve a real interest in the other person, and shared values, as a basis for dialogue) are contrasted with I-It relationships

(these involve ordinary or ritualised interactions where the 'other' is treated as an 'it' and there is no sense in which the 'I' shares common values with the 'other'). In developing a sub-scale inspired by this concept, the intention is to provide a measure that combines adolescents' own educational values with the values held by the students with whom they have close relationships at school. Students who score highly on the Value Coherence scale care about doing well at school, and also have close friends who care about doing well.

Theoretical support underlying the hypothesised Value Coherence scale derives from (a) the long-recognised status of early adolescence as the high point of peer conformity (Berndt, 1979; Steinberg & Silverberg, 1986) and (b) findings which indicate that adolescents' social ties tend to link them to other students who hold similar academic values. In effect, high-achievers are likely to belong to academically supportive groups, while the disengaged are likely to reinforce each other's tendencies toward dropout (Kim et al., 2011). A number of recent studies indicate that when a student associates with high-performing peers, this tends to lead to an increase in academic engagement (e.g., Crosnoe, Cavanagh, & Elder, 2003; Frank et al., 2008). These arguments suggest that an engagement scale, such as the SRSE scale, should reflect students' valuing of school together with their perceptions of the values espoused by their peers.

Aims and Hypothesis

Study Aims

The aim of this study is to test the psychometric properties of the newly developed Social Relational Support for Education (SRSE) scale with secondary school students (12 to 16 years of age) and to ascertain: (a) the congeneric nature of each of the constructs of the SRSE; (b) the a-priori five factor structure; (c) reliability; (d) factorial invariance across critical groups (sex, year, as well as sex by year groups); and (e) sex and year effects using a MIMIC model approach.

Statement of Hypotheses

It is hypothesised that (1) each one-factor model will be congeneric; (2) the a-priori five factor structure of the SRSE (Perceived Parental Support for Education, Teacher Respect at School, Value Coherence, Belonging at School, Friends at School) will be demonstrated using a Confirmatory Factor Analysis (CFA - see Figure 1); (3) each of the five scales from the SRSE will be a reliable measure for adolescent Australian students, as well as across critical groups (e.g., sex); and (4) the SRSE will be shown to be invariant across critical groups (sex, year), as well as across the interaction of critical groups (sex by year).

In addition, three research questions were posed: (1) In what domains will males and females report higher social support for their education? (2) Which year level will report higher social support for their education? (3) What impact will the interaction of sex and year have on each of the five constructs of the SRSE?

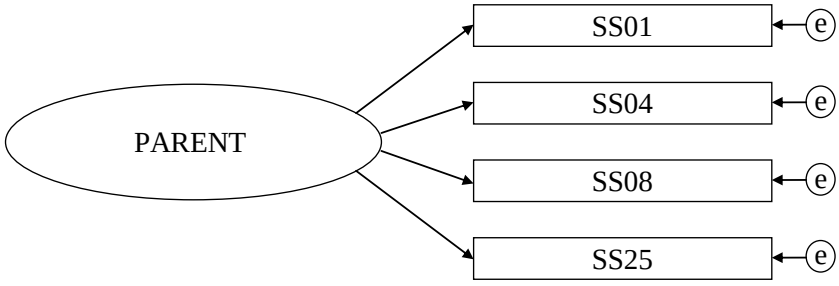

Figure 1. One-factor congeneric model of PARENT factor of SRSE

Note. Ovals represent latent factors, rectangles represent each item measuring each latent factor, 'e' represents uniqueness.

METHOD

Participants

This study consisted of data collected in 2009. The sample comprised 1966 students in Years 7 (*n*=650), 8 (*n*=643), and 9 (*n*=673), attending nine comprehensive, New South Wales (NSW) secondary government schools equally distributed across three regions. One of these three regions was classified urban, the second primarily an agricultural rural region, and the third region contained a mixture of coastal agricultural and mining enterprises. In all three regions, the Index of Community Socio-Educational Disadvantage (ICSEA) scale was utilised to identify in consultation with the NSW Department of Education and Communities (DEC), the nine schools representing similarly low levels of educational advantage. ICSEA infers educational advantage from measuring parents' occupation and level of education completed, and their educational achievement. A value on the scale assigned to a school is the averaged level for all students in the particular school. ICSEA was developed to enable fair and meaningful comparisons of students' academic performance in a given school with that of similar schools serving students with statistically similar backgrounds. Hence the nine schools selected for this study were classified as having profiles normally associated with low retention rates and all nine schools were statistically similar given their comparable ICSEA scores.

Procedure

Administration of the questionnaire was completed by researchers who read aloud the questionnaire to students. The SRSE was administered in a battery with other instruments over a 45-minute session.

Instrument Construction

Items from the SRSE were constructed with cognitive, affective, and behavioural elements associated with social-relational factors that may contribute to student engagement. Students' primary relationships with parents, teachers, and their peers entail value and affective components that are salient in this context. The newly developed SRSE contains five constructs: Perceived Parental Support for Education, Teacher Respect at School, Value Coherence, Social Affiliation, and Friends at School. This set of social-relational factors were included in the study because they are predicted to interact over time to changing levels of student engagement and participation, ultimately leading young people to drop out, or stay on, at school. Yet, to-date, these factors have largely been ignored in the literature (see Introduction).

While some items were newly developed based on theory, many items were drawn and adapted from previous research. Firstly, the two factors Perceived Parental Support for Education and Teacher Respect at School were developed based on items drawn from a study by Marks (2000). The factor Perceived Parental Support for Education was constructed based on the 'Parental Support for Learning Index' (Marks, 2000) which asked students to respond to the frequency with which their parents participated in or had discussions with them about their schooling. Items in the SRSE were then developed based on the value parents' placed on their child's education. The factor Teacher Respect at School was developed based around the item "Most of my teachers really listen to what I have to say" (Marks, 2000) with a particular focus on the core features of what students' value in their teachers (e.g., listening, caring).

The factor Value Coherence was inspired by the work of Buber (1958) and his concept of I-It relationships. This is a measure of the conformity between the value placed on education by the students themselves and the value placed on education by their friends. This is further based on the idea that students form friendships with those who value education to the same degree as they do, and this friendship matching and value coherence may contribute to school engagement or disengagement. One item was adapted from the factor Pride of the School Identification Questionnaire (Tyler & Blader, 2003): 'I feel proud to be a student in the school', with further items constructed around this item with the idea of I-It relationships in mind.

Social Affiliation was developed with respect to the social-relational aspect of peer affiliations at school. Two items were derived from the Social Support for Learning Measure by Marks (2000): 'In

school I often feel "put down" by other students', and 'I don't feel safe at this school'. Further items were adapted from the PISA measures of Student Engagement related to peer affiliation.

Friends at School was constructed to add-to the social-relational model wherein student friendship groups play a pivotal role to their engagement in school. These items were also adapted from the PISA measure of Student Engagement.

The newly developed SRSE contains five constructs: Perceived Parental Support for Education, Teacher Respect at School, Value Coherence, Belonging at School, and Friends at School. Items for each of these factors were included in the study because, as indicated in the literature review above, they are predicted to interact over time and contribute to the changing levels of student engagement and participation, ultimately leading young people to drop out, or stay on, at school. In total 25 items were developed for the original SRSE (see Table 1). All items were measured on a five-point Likert response scale (1 = Completely Disagree, 2 = Mostly Disagree, 3 = Sometimes Agree, Sometimes Disagree, 4 = Mostly Agree, 5 = Completely Agree).

Data Analysis Procedures

Data Screening.

Preliminary analyses and data screening were conducted using SPSS 17.0 (Hills, 2010). Considering that missing values did not exceed 5% for any one item, the guidelines of Tabachnik and Fidell (2007) and Schafer and Graham (2002) for dealing with missing values (i.e., Expectation Maximization (EM) algorithm) and univariate and multivariate outliers were utilised.

Confirmatory factor analysis.

Since all of the instruments were written based on theoretically driven a-priori factors, varying confirmatory factor analysis (CFA) techniques were utilised to ascertain the psychometric properties of the SRSE. Indeed CFA is recognised as one of the strongest methodologies to examine the between and within network validity of measurement instruments (Bodkin-Andrews, Ha, Craven, & Yeung, 2010; Palmieri, Weathers, Difede, & King, 2007). All CFA were conducted with Mplus 5.21 (Muthén & Muthén, 2006) using maximum likelihood estimation (Byrne, 2012), and the first CFA technique utilised was that of multiple one factor congeneric testing (see Figure 1 for example) to individually examine the psychometric properties of each hypothesised latent factor (Bodkin-Andrews, et al., 2010). This was followed by a full multi-factor CFA where an overall assessment of the within and between network properties of the SRSE were examined across all participants within this study (for a pictorial example see Figure 2). Across all CFA models, the iterative method of maximum likelihood estimation was employed as this method has been found to be a robust technique in estimating goodness of fit indices (Hu, Bentler, & Kano, 1992). All items were constrained to load on only the factor it was intended to measure, while all cross- loadings were forced to zero. Following recommendations that multiple fit indices should be examined across both incremental and absolute indices, (Bodkin-Andrews, et al., 2010; Marsh, Balla & Hau, 1996), the Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA) were reported. For the TLI and CFI, values greater than.90 are deemed acceptable, and for the RMSEA, values less than .10 reflect an acceptable fit (Bentler, 1990).

Invariance testing.

An important extension of the CFA framework can be found in the technique of factorial invariance/equivalence testing, whereby models are compared across distinct groups to assess whether the instrument may hold the same meaning for all groups (Marsh, 1994; Marsh, Tracey & Craven, 2006). Within this investigation invariance testing will be conducted between critical groups (e.g., year and sex), but also across the interactions of these critical groups: (1) sex (male, female); (2) year (year 7 to 10); and (3) sex by year (e.g., male year 7, female year 7, male year 8, female year 8).

Table 1: Items used within the Social Relational Support for Education Scale (Vickers & Barker, 2011)

Item Number	Item	Factor
SS01	In school I often feel "put down" by other students	BELONG
SS02	My parents/guardians would really like me to finish Year 12	PARENT
SS03	I often feel like an outsider (or left out of things) at my school	BELONG
SS04	My parents/guardians think that if I do well at school it will improve my chances in life	PARENT
SS05	I make friends easily at my school	FRNDS
SS06	Staff members at my school ask students for their ideas on how things could be improved	TEACH
SS07	Most of my teachers really listen to what I have to say	TEACH
SS08	Doing well at school is something my parents take seriously	PARENT
SS09	Going to classes is mostly enjoyable	VALUECO
SS10	At my school, staff members invite students to raise their concerns or problems	TEACH
SS11	I don't feel safe at this school	BELONG
SS12	My parents/guardians think that if I complete Year 12 it will be good for my career	PARENT
SS13	I feel proud to be a student in this school	VALUECO
SS14	Other students seem to like me	FRNDS
SS15	Staff care about the student opinions in my school	TEACH
SS16	Most of my friends like this school	VALUECO
SS17	Students' views and needs are considered when decisions are made at this school	TEACH
SS18	I feel lonely at this school	BELONG
SS19	At school I feel awkward and out of place	BELONG
SS20	Staff apologise to us if they make mistakes	TEACH
SS21	I do not want to go to school anymore	VALUECO
SS22	I often feel bored at this school	VALUECO
SS23	I have lots of friends at this school	FRNDS
SS24	Most of my friends care about doing well at school	VALUECO
SS25	My parents/guardians think doing well in school is an important basis for success in later life	PARENT

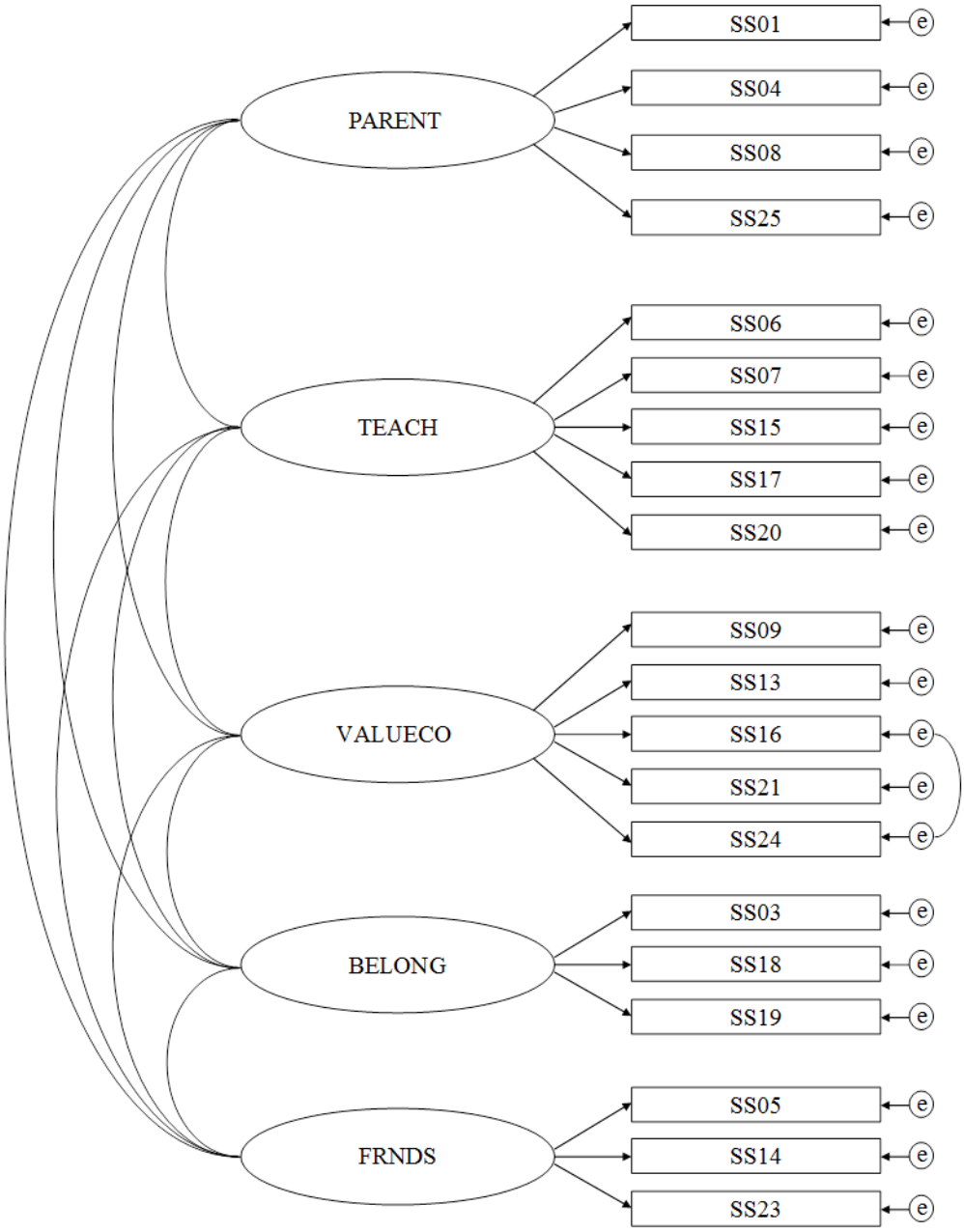

Figure 2: Confirmatory factor structure of SRSE

Note. Ovals represent latent factors, rectangles represent each item measuring each latent factor, 'e' represents uniqueness, curved lines between latent factors represent correlations between latent factors, curved line between uniqueness represents correlated error terms.

Although it is agreed that one should begin with a fully free multi-group model with no invariance constraints between groups, there is considerable variation as to the nature and order of the model parameters to be held invariant across groups thereafter (Byrne, 2012; Marsh et al., 2006). Some consensus has been reached though that the first comparative model where factor loadings be considered invariant, should be the minimal requirement for invariance assumptions (Byrne, 2012; Parker, Dowson, & McInerney, 2007). Bodkin-Andrews, et al. (2010) further argues consideration should also be given to factor covariances (in multifactor models) as a minimal requirement (see Marsh, 1994). Although uniqueness estimates are often deemed too restrictive for assumptions of invariance, as per the advice of Byrne (2012), they will be reported as a form of good practice.

In determining whether the multi-group models are invariant, the recommendation of Cheung and Rensvold (2002) will be utilised whereby if the CFI varies by greater than +/- .01 between the more restrictive models and the completely free model, invariance assumptions will be violated. In consideration that multiple fit indices should be utilised, the advice of Bodkin-Andrews et al. (2010) will also be considered where by an overlap between the 90% confidence interval of the RMSEA must also be observed.

Multiple-Indicator-Multiple-Cause Models (MIMIC).

Testing the effect of sex and year, as well as sex by year interactions was conducted with Multiple-Indicator-Multiple-Cause Models (MIMIC) (Kaplan, 2000). When MIMIC models are conducted, latent constructs are identified by both endogenous observed indicators (i.e., items comprising each latent factor) and endogenous causal variables (i.e., sex and year). In order to reduce potential multicollinearity issues, Aiken and West (1991) recommend that endogenous causal variables (i.e., sex and year) are zero-centred (standardised) prior to conducting MIMIC. Models are evaluated with the same goodness of fit indices as when conducting CFA, after which significant findings are established with beta coefficients (i.e., paths from sex and year variables to the SRSE constructs).

RESULTS

The SRSE was designed to measure five aspects of social-relational student educational support: Perceived Parental Support for Education, Teacher Respect at School, Value Coherence, Belonging at School, and Friends at School.

One-Factor Congeneric Testing

One-factor congeneric models were conducted separately across each of the five SRSE latent factors, with items being removed as per accepted model-trimming strategies (Kline, 1998). Once acceptable indices were identified for each factor, the full CFA was conducted.

Perceived Parental Support for Education (PARENT).

The original model (see Table 2) for the PARENT measure (SS02, SS04, SS08, SS12, SS25) revealed strong and significant factor loadings for all items (mean loading of .71), but only produced acceptable to poor fit indices (χ^2 = 107.49, df = 5; CFI = .970, TLI = .940; RMSEA = .102). The largest source of misspecification was found in correlated residuals between item SS12 and three other items. Upon inspection of the item itself, we found that the other items referred to general student perceptions of their parents concern about success at school. While item SS12 was specific to parental perceptions of completing Year 12 as a means for future career success. This may have been interpreted differently by students in comparison with the other more broadly defined items (e.g., 'My parents/guardians would really like me to finish Year 12'), and hence was removed. A second model was conducted with the remaining four items and showed excellent fit statistics (χ^2 = 8.09, df = 2, RMSEA = .039, CFI = .997, TLI = .991), thus this model was accepted.

Teacher Respect at School (TEACH).

The TEACH measure (SS06, SS07, SS10, SS15, SS17, SS20 - See Table 2) revealed strong factor loadings (mean of .71), and acceptable fit indices (χ^2 = 42.93, df = 9, RMSEA = .044, CFI = .993, TLI = .988). Large correlated residuals were found between item SS10 and 2 other TEACH

items. Upon closer inspection, we found that item SS10 referred to staff specifically asking students to raise their concerns, whereas the other items targeted student perceptions of whether they thought teachers listened to or cared about student opinions, concerns, and ideas in general (e.g., 'Most of my teachers really listen to what I have to say'). As a result this item (SS10) was removed and thus the second model revealed excellent fit statistics (χ^2 = 11.90, df = 5, RMSEA = .026, CFI = .998, TLI = .996) and was accepted.

Value Coherence (VALUECO).

The original VALUECO measure (SS09, SS13, SS16, SS21, SS22, SS24), although revealing strong factor loadings (mean loading of .64 - see Table 2), only produced mediocre fit indices (χ^2 = 212.04, df = 9, RMSEA = .107, CFI = .940, TLI = .900). Large correlated residuals were found between numerous items, and a closer inspection revealed that SS22 focussed on asking students if they were bored at school, as opposed to the other items which referred to whether students or their friends were proud of, liked, or cared about school. As a result, SS22 was removed, and the second model showed an improved model fit, but still with mediocre fit statistics (χ^2 = 100.52, df = 5, RMSEA = .099, CFI = .962, TLI = .923). Large correlated residuals were found between items SS16 and SS24 and it was found that they contained the same stem at the beginning of the items (i.e., Most of my friends...), which differed from all other items. Due to the effect of the parallel wordings of items SS16 and SS24, it was expected that the item uniqueness would be correlated, and as a result this parameter was freed (producing a significant value of .169 in the following model). The subsequent model was stronger and had satisfactory fit statistics (χ^2 = 62.50, df = 4, RMSEA = .086, CFI = .976, TLI = .941) thus, it was accepted. It should be noted that although there are disadvantages to conducting post-hoc correlations of uniqueness, Byrne (2012) argues that if such estimates can be theoretically or conceptually justified, they may be retained so long as they are reproduced in subsequent studies. Given the parallel wording between items, the use of correlated uniqueness was justified.

Belonging at School (BELONG).

The original BELONG measure (SS01, SS03, SS11, SS18, SS19) revealed strong factor loadings of all items (mean of .67, see Table 2) and satisfactory fit indices found (χ^2 = 74.23, df = 5, RMSEA = .084, CFI = .977, TLI = .953).

Large correlated residuals (values ranging from 12.10 to 64.19) were found between item SS01 and three other items. Item SS01 was further analysed to determine the explanation for the misfit. SS01 referred specifically to students feeling like they were 'put down' at school as opposed to the other items reflecting general student feelings of inclusion at school (feeling awkward, safe, or lonely at school), as such, this was removed. The second model showed improved model fit with excellent fit statistics (χ^2 = 3.48, df = 2, RMSEA = .019, CFI = .999, TLI = .998), revealing that Model 2 fits the data well (see Table 2), and was retained.

Friends at School (FRDS).

There were three items in the original FRDS measure (SS05, SS14, SS23), and although the original FRDS revealed strong factor loadings (mean of .77, see Table 2), due to there being only three items, the model was just identified. As a result, the model fit indices were not examined until the full CFA model was conducted.

Confirmatory Factor Analysis

The full CFA was conducted on all of the adjusted SRSE factors and the model resulted in an acceptable fit to the data (979.25, *df* = 178, TLI = .947, CFI = .938, RMSEA = .048). An inspection of the modification indices revealed the item 'I do not feel safe at this school' (SS11) from the BELONG factor was correlating strongly with the TEACH (136.80) and VALUECO (MI=127.32) factors. Item SS11 was subsequently removed. Model 2 with SS11 removed (see Table 3) resulted in an improved model, with excellent fit indices (χ^2 = 776.13, df = 159, RMSEA = .044, CFI = .958, TLI = .950). This model revealed significant factor loadings of all items onto their respective factors (ranging from .49 to .85, see Table 3 for factor loadings, factor correlations, and fit statistics). As expected, correlations

between BELONG and FRNDS were high (.71), suggesting that when students felt they had friends at school, they felt a sense of belonging at school. Interestingly, a high correlation was also found between TEACH and VALUECO (.76), suggesting that when students and their friends liked school, they also felt staff listened and were concerned about student opinions. Importantly, all other correlations were found to be significant and positive (ranging from .20 to .46) demonstrating that enjoying school, and perceiving your friends enjoying school was associated with the perception that their parents supported their education, perceptions that staff listened to student concerns, and a feeling of belonging and having friends at school.

Table 2: One-Factor Congeneric Model Parameter Estimates and Model Fit of the SRSE

Model	$\bar{x}\lambda$	χ^2	*df*	CFI	TLI	RMSEA	Comments
Perceived Parental Support for Education (PARENT)							
Model 1	.71	107.49	5	.970	.940	.102	
Model 2	.69	8.09	2	.997	.991	.039(	SS12 deleted from model
Teacher Respect at School (TEACH)							
Model 1	.71	42.93	9	.993	.988	.044	
Model 2	.71	11.90	5	.998	.996	.026	SS10 deleted from model
Value Coherence (VALUECO)							
Model 1	.64	212.04	9	.940	.900	.107	
Model 2	.64	100.52	5	.962	.923	.099	SS22 deleted from model
Model 3	.64	62.50	4	.976	.941	.086	Correlated uniqueness of SS16 and SS24
Belonging at School (BELONG)							
Model 1	.67	74.23	5	.977	.953	.084	
Model 2	.67	3.48	2	.999	.998	.019	SS01 deleted from model
Friends at School (FRNDS)							
Model 1	.77	na	na	na	na	na	

Note: $\bar{x}\lambda$ = mean factor loading(parameter estimate); χ^2=Chi-square; *df*=degrees of freedom; CFI=Comparative Fit Index; TLI=Tucker-Lewis Index; RMSEA=Root Mean Square Error of Approximation.

Table 3: Parameter Estimates, Correlations, and model fit for the Confirmatory Factor Analysis of SRSE Item Loadings to their a-priori Factors for W1 Data

	PARENT	TEACH	VALUECO	BELONG	FRNDS
	Model 2 Parameter Estimates (R^2)				
Item 1	.59(.35)	.68(.46)	.80(.64)	.70(.48)	.79(.63)
Item 2	.73(.53)	.76(.57)	.67(.44)	.77(.60)	.77(.59)
Item 3	.71(.50)	.85(.71)	.64(.41)	.73(.53)	.74(.55)
Item 4	.74(.54)	.68(.46)	.49(.24)		
Item 5		.61(.38)	.57(.33)		
	Model 2 Factor Correlations				
PARENT	--				
TEACH	.33	--			
VALUECO	.46	.76	--		
BELONG	.20	.28	.42	--	
FRNDS	.21	.27	.38	.71	--
Model Fit					
Model (*N*)	χ^2	*df*	CFI	TLI	RMSEA
Model 1 (1966)	979.25	178	.947	.938	.048(.883)
Model 2 (1966)	776.13	159	.958	.950	.044(.998)

Note. Items 1-5=Instrument items correspond to latent factors; PARENT= Perceived Parental Support for Education; TEACH= Teacher Respect at School; VALUECO= Value Coherence; BELONG= Belonging at School; FRNDS= Friends at School; R^2= R squared; N=Total participants in sample; χ^2=Chi-square; *df*=degrees of freedom; CFI=Comparative Fit Index; TLI=Tucker-Lewis Index; RMSEA=Root Mean Square Error of Approximation.

Table 4 shows the descriptive statistics (i.e., mean and standard deviation) for each critical group (sex, year, and sex by year groups) for the final five latent factors of the SRSE. Table 5 reveals the internal consistency (reliability estimates) for the SRSE, and shows that each factor reached strong levels of internal consistency (Nunnally, 1978, estimates above .60 are acceptable for exploratory research) with the total sample (alpha coefficients ranging from α = .78 to .84, mean α = .80). When reliability estimates were conducted across groups, all alpha coefficients ranged within acceptable levels (α = .70 to .80, mean α = .79), with male year 7 students having generally slightly lower estimates across the scales (mean α = .76).

Table 4: Descriptive Statistics of SRSE Latent Factors by Critical Groups During Each Time Wave

	PARENT	TEACH	VALUECO	BELONG	FRNDS
Mean (*n*)					
Total (1966)	4.59	3.32	3.53	4.08	3.92
Female (987)	4.63	3.39	3.60	4.08	3.96
Male (979)	4.54	3.24	3.46	4.08	3.89
Year 7 (650)	4.60	3.50	3.68	4.05	3.93
Year 8 (643)	4.59	3.27	3.50	4.09	3.91
Year 9 (673)	4.57	3.19	3.41	4.10	3.93
f7 (346)	4.67	3.60	3.80	4.09	4.00
f8 (300)	4.61	3.38	3.60	4.05	3.93
f9 (341)	4.60	3.19	3.41	4.10	3.96
m7 (304)	4.54	3.37	3.55	4.01	3.85
m8 (343)	4.56	3.17	3.41	4.14	3.90
m9 (332)	4.53	3.19	3.42	4.09	3.90
Standard Deviation					
Total	0.57	0.89	0.82	0.89	0.84
Females	0.54	0.87	0.81	0.91	0.83
Males	0.59	0.90	0.82	0.88	0.86
Year 7	0.54	0.83	0.80	0.89	0.87
Year 8	0.58	0.94	0.85	0.91	0.87
Year 9	0.58	0.88	0.79	0.88	0.79
f7	0.50	0.81	0.75	0.89	0.85
f8	0.54	0.87	0.83	0.94	0.83
f9	0.56	0.88	0.81	0.89	0.80
m7	0.57	0.84	0.82	0.88	0.87
m8	0.61	0.98	0.86	0.88	0.91
m9	0.59	0.87	0.77	0.87	0.79

Note. PARENT= Perceived Parental Support for Education; TEACH= Teacher Respect at School; VALUECO= Value Coherence; BELONG= Belonging at School; FRNDS= Friends at School; *n*=number of participants in critical group; Total=Total Sample; f7=Female Year 7 data; f8= Female Year 8 data; f9= Female Year 9 data; m7=Male Year 7 data; m8= Male Year 8 data; m9= Male Year 9 data.

Table 5: Coefficient Alpha Estimates of the SRSE Factors Assessed Across the Total Sample as well as by Sex, Year, and Sex by Year Groups

	PARENT	TEACH	VALUE	BELONG	FRNDS	Mean
Total (*n*)	0.78	0.84	0.78	0.78	0.81	0.80
Fem (987)	0.78	0.83	0.79	0.79	0.80	0.80
Male (979)	0.79	0.84	0.76	0.76	0.82	0.79
Yr7 (650)	0.76	0.81	0.76	0.73	0.79	0.77
Yr8 (643)	0.78	0.85	0.78	0.78	0.83	0.80
Yr9 (673)	0.81	0.84	0.78	0.82	0.82	0.82
f7 (346)	0.75	0.81	0.76	0.76	0.79	0.77
f8 (300)	0.75	0.83	0.80	0.80	0.79	0.79
f9 (341)	0.81	0.85	0.81	0.83	0.83	0.82
m7 (304)	0.75	0.81	0.75	0.70	0.79	0.76
m8 (343)	0.80	0.86	0.77	0.75	0.85	0.81
m9 (332)	0.81	0.84	0.76	0.81	0.82	0.81

Note. PARENT= Perceived Parental Support for Education; TEACH= Teacher Respect at School; VALUE= Value Coherence; BELONG= Belonging at School; FRNDS= Friends at School; *n*=number of participants in critical group; Total=Total Sample; Fem=Female; Yr7= Year 7 group; Yr8= Year 8 group; Yr9= Year 9 group; f7=Female Year 7 data; f8= Female Year 8 data; f9= Female Year 9 data; m7=Male Year 7 data; m8= Male Year 8 data; m9= Male Year 9 data.

Factorial Invariance Testing

Prior to commencement of factorial invariance testing, CFA were run on each group to ensure satisfactory goodness of fit estimates were identified. As seen in Table 6, each group had satisfactory RMSEA (ranging from .043 to .060), TLI (ranging from .919 to .947), and CFI (ranging from .907 to .953) estimates. Factor loadings ranged from .45 to .89, and factor correlations of each group were similar to that of the final full CFA model.

The SRSE was first assessed for invariance across sex, followed by year, and then sex by year (see Table 7). In total five increasingly restrictive models were tested (completely free -> factor loadings invariant -> intercepts invariant -> factor loadings and intercepts invariant -> factor loadings, intercepts, covariances, and uniqueness invariant) across each sample splitting. Overall, the results for the invariance testing were exceptionally strong. Firstly, as recommended by Byrne (2012), inspection of the overall fit statistics suggests that regardless of the invariance restraints, all models produced acceptable fit indices. Secondly, with regard to the incremental fit index of the CFI, complete invariance was met for all models across sex according to the +/- .01 modification criteria of Cheung and Rensvold (2002). In addition, for the year model, while complete invariance was not met (.951 -> .931), all other models satisfied the criteria for invariance. Regarding the sex by year modelling, minimal requirements of invariance were met (i.e., factor loadings, intercepts), although factor loadings and intercepts together (.938 -> .927), plus complete invariance was not achieved. Focussing on the absolute fit index of the RMSEA and the required overlap of its 90% confidence interval, complete invariance was achieved for all models. Overall, these results strongly support the structural integrity of the SRSE scale as invariant across sex, year, and sex by year groups.

MIMIC: The effect of sex and year on each factor of the SRSE

One MIMIC model was conducted to examine the effect of sex and year, as well as sex by year interactions on the SRSE factors. Goodness of fit indices and beta coefficient results are presented in Table 8, and acceptable fit indices can be observed (χ^2 = 9893.92, *df* = 204, TLI = .943, CFI = .953, RMSEA = .041). In relation to the main effects of sex, females were found to have significantly

Table 6: Parameter Estimates, Correlations, and model fit for the Confirmatory Factor Analysis of SRSE Item Loadings to their a-priori Factors

	PARENT	TEACH	VALUECO	BELONG	FRNDS
	Model 2 Parameter Estimates Minimum $Value_{group}$ – Maximum $Value_{group}$				
Item 1	53_{m8}-$.66_{f9}$	62_{m7}-$.73_{m8}$	$.76_{f7}$-$.82_{m8}$	$.61_{m7}$-$.74_{f9}$	$.75_{f7}$-$.85_{m7}$
Item 2	$.67_{m7}$-$.81_{m8}$	$.67_{f7}$-$.83_{f9}$	$.59_{m7}$-$.69_{f9}$	$.71_{m7}$-$.82_{m9}$	$.71_{m7}$-$.83_{m8}$
Item 3	$.60_{f8}$-$.78_{m9}$	$.79_{f7}$-$.89_{m8}$	$.55_{m9}$-$.69_{f9}$	$.66_{m7}$-$.82_{f9}$	$.67_{f8}$-$.83_{m9}$
Item 4	$.67_{f7}$-$.83_{m9}$	$.63_{m9}$-$.71_{8}$	$.45_{m8}$-$.56_{f8}$		
Item 5		$.57_{m7}$-$.64_{f7}$	$.52_{m7}$-$.62_{f9}$		
	Model 2 Factor Correlations Minimum $Value_{group}$ – Maximum $Value_{group}$				
PARENT	--				
TEACH	$.26_{f9}$-$.39_{m9}$	--			
VALUECO	$.36_{f7}$-$.56_{m9}$	$.72_{m9}$-$.79_{m7}$	--		
BELONG	$.14_{f7}$-$.27_{m7}$	$.19_{f9}$-$.35_{f8}$	$.29_{m9}$-$.54_{f8}$	--	
FRNDS	$.09_{f7}$-$.34_{m7}$	$.13_{f9}$-$.41_{f8}$	$.27_{f9}$-$.47_{f8}$	$.59_{m9}$-$.82_{m8}$	--

Model Fit (n)	$\chi 2$	df	CFI	TLI	RMSEA
Model 2 Fit by Critical Groups					
Total (1966)	776.13	159	.958	.950	.044
Female (987)	545.04	159	.948	.938	.050
Male (979)	438.81	159	.961	.954	.042
Year 7 (650)	365.35	159	.950	.941	.045
Year 8 (643)	389.28	159	.954	.946	.047
Year 9 (673)	444.78	159	.948	.938	.052
f7 (346)	289.48	159	.941	.930	.049
f8 (300)	316.45	159	.929	.916	.057
f9 (341)	360.88	159	.932	.919	.061
m7 (304)	300.60	159	.927	.912	.054
m8 (343)	271.97	159	.961	.953	.046
m9 (332)	317.75	159	.940	.928	.055

Note. Items 1-5=Instrument items correspond to latent factors; PARENT= Perceived Parental Support for Education; TEACH= Teacher Respect at School; VALUECO= Value Coherence; BELONG= Belonging at School; FRNDS= Friends at School; R^2= R squared; n=number of participants in critical group; χ^2=Chi-square; df=degrees of freedom; CFI=Comparative Fit Index; TLI=Tucker-Lewis Index; RMSEA=Root Mean Square Error of Approximation; Total=Total Sample; f7=Female Year 7 data; f8= Female Year 8 data; f9= Female Year 9 data; m7=Male Year 7 data; m8= Male Year 8 data; m9= Male Year 9 data.

higher perceptions of their parents' support for schooling, perceptions that staff cared about their concerns, and shared personal and friend enjoyment of school (VALUECO), when compared to males. The main effects for year showed significant differences in relation to student perceptions of teacher concern, and shared personal and friend enjoyment of school, whereby later year students were less likely to feel their teacher cared about them, and less likely to express a shared person/friend enjoyment of school.

Table 7: Invariant Testing of Sex, Year, and Sex by Year with Chi-Square, Degrees of Freedom and Fit Indices of the SRSE

Model Fit	χ^2	*df*	CFI	TLI	90% CI of RMSEA
Factorial Invariance of Model					
Sex(Invariant)(n_f=987; n_m=979)					
No	1008.90	319	.953	.944	.044 - .050
FL	1020.98	334	.953	.947	.043 - .049
INT	1053.21	338	.951	.945	.043 - .050
FL + INT	1081.59	353	.950	.946	.043 - .049
FL+INT+FCV+U	1204.19	389	.944	.946	.043 - .049
Year (Invariant)(n_7=650; n_8=643; n_9=673)					
No	1202.45	479	.951	.941	.045 - .051
FL	1232.89	509	.951	.945	.043 - .050
INT	1316.76	517	.946	.940	.049 - .052
FL + INT	1375.28	547	.944	.941	.045 - .051
FL+INT+FCV+U	1632.03	619	.931	.937	.047 - .053
Sex by Year (Invariant)(n_{7f}=346; n_{8f}=300; n_{9f}=341; n_{7m}=304; n_{8m}=343; n_{9m}=332)					
No	1885.40	959	.938	.926	.051 - .058
FL	1969.86	1034	.937	.931	.049 - .056
INT	2102.82	1054	.929	.924	.052 - .059
FL + INT	2211.72	1129	.927	.926	.051 - .057
FL+INT+FCV+U	2689.19	1309	.907	.919	.054 - .060

Note. No = no invariance, full-free model; FL=Factor Loadings invariant; INT=Intercepts invariant; FCV=Factor Covariances and Variances invariant; U = Uniqueness invariant; *n*=number of participants in sample; m=male data; f=female data; 7=Year 7 data; 8= Year 8 data; 9= Year 9 data; f7=Female Year 7 data; f8= Female Year 8 data; f9= Female Year 9 data; m7=Male Year 7 data; m8= Male Year 8 data; m9= Male Year 9 data.

The interaction of sex and year resulted in a significant interaction on two scales: TEACH, and VALUECO. This is demonstrated in Figure 3. While year 7 females reported higher perceptions of teacher respect at school (M = 3.60) and Value Coherence (M = 3.80) than year 7 males (M = 3.37 and M = 3.55 respectively), and year 8 females reported higher perceptions of teacher respect at school (M = 3.38) and Value Coherence (M = 3.60) than year 8 males (M = 3.17 and M = 3.41

Table 8: Effect of grade, gender, and gender by grade interactions on the SRSE

	χ^2	*df*	CFI	TLI	RMSEA
Goodness of Fit Indices					
Model Fit	893.93	204	.953	.943	.041(1.00)
Standardised Beta Coefficients					
	Sex		Year	Sex by Year	
PARENT	-.073**		-.027	.023	
TEACH	-.091***		-.144***	.060*	
VALUECO	-.091***		-.171***	.073**	
BELONG	.001		.023	.017	
FRNDS	-.049		.000	.022	

** p < .05, ** p < .01, *** p < .001*

Note. χ^2=Chi-square; *df*=degrees of freedom; CFI=Comparative Fit Index; TLI=Tucker-Lewis Index; RMSEA=Root Mean Square Error of Approximation; PARENT= Perceived Parental Support for Education; TEACH= Teacher Respect at School; VALUECO= Value Coherence; BELONG= Belonging at School; FRNDS= Friends at School.

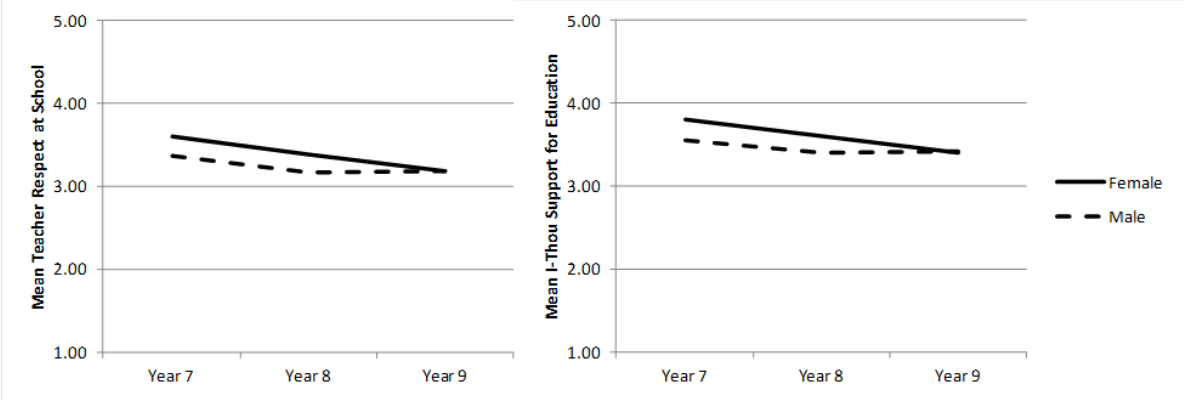

Figure 3: Sex by year interaction for factors TEACH and VALUECO from the SRSE

respectively), the difference in perceptions of teacher respect at school and Value Coherence between males and females was less pronounced in year 9 (TEACH: Mfemale = 3.19 and Mmale = 3.19; VALUECO: Mfemale = 3.41 and Mmale = 3.42). Both TEACH and VALUECO decreased from year 7 to year 9 for females, and also decreased from year 7 to year 8 for males, but remained stable from year 8 to year 9 for males.

DISCUSSION

This study was developed to test the newly constructed Social Relational Support for Education (SRSE) scale. Results from structural equation modelling techniques supported the four hypotheses relating to the structural integrity of SRSE. This study further explored the research questions relating to the educational social support systems perceived by male and female students across the early years of secondary school (years 7 to 9). This paper represents a valuable step in determining the ways students' social contexts might influence their academic engagement, providing a comprehensive measure of these contextual factors.

The newly developed SRSE scale contains five constructs: Perceived Parental Support for Education, Teacher Respect at School, Value Coherence, Belonging at School, and Friends at School. Reiterating the arguments that support these scales: firstly in relation to parents, while past studies have emphasised parental participation in school activities, recent research suggests that students' perceptions of parental support play a more salient role in predicting students' own academic values (Gniewosz & Noack, 2012). Secondly, students' perceptions of the way their teachers treat them also appear to have substantial cumulative effects on their motivation and engagement (Eccles & Roeser, 2011; Vallerand et al., 1997). Thirdly, a sense of belonging at school and having friends at school are both closely related factors impinging on student engagement (Juvonen, 2007; Kim et al., 2011; McGaha & Fitzpatrick, 2005). And lastly, the Value Coherence factor is an innovation designed to measure the ways in which individual students' own engagement (or their disengagement) might be related to and supported by the engagement (or disengagement) of the friends with whom they associate.

After some refinements as described above, all five latent factors were found to be supported by the selected scale items. The CFA of responses to the full SRSE scale indicated strong factor loadings of all items onto their respective scales and excellent model fit. Invariance testing supported the structural integrity of the SRSE model as invariant across sex, year and sex by year groups.

In addition, relating to the first research question, females were found to hold a significantly higher perception of their parents' value of schooling than males across all grade levels investigated. Given the participating schools already came from low SES areas with (on average) low retention rates, it is possible that male students may perceive that their parents place lesser importance on their education than females as males may perceive that they are expected to leave school early to begin working.

In relation to the second and third research questions, two significant interactions were found for both Teacher Respect at School and Value Coherence. This showed that while year 7 students held higher perceptions than year 8 or 9 students, the drop in perceptions of teacher respect and the value of schooling they share with their peers may occur earlier for males than females. That is, the drop in perceptions of teacher respect and school values was more pronounced for males than females between years 7 and 8 (and stable across years 8 and 9), whereas for females, the decline is gradual from years 7 to 9. Interestingly, a similar pattern of results was found for the two factors Teacher Respect as School and Value Coherence. That is, the drop in perceptions of both teacher respect and school values occurs simultaneously across grades for males and females. It is possible that this decline is due to a students' growing need for autonomy as they advance through the adolescent years (Gniewosz, Eccles, & Noack, 2012). It is interesting to note the stronger drop in perceptions for males between year 7 to 8 (whereby for females this drop was more gradual), followed by the stabilisation of these perceptions thereafter. It would be useful for future research to expand on this study with reference to later year groups to ascertain the ongoing patterns following year 9.

Limitations and future directions

Missing values were dealt with using Expectation Maximization (EM) algorithm and despite this approach being "well regarded" (Olinsky, Chen, & Harlow, 2003, p.58), it would be desirable for future research to deal with missing data by employing the more sophisticated Full Information Maximum Likelihood (FIML). Although ICSEA scores demonstrate that the nine schools identified by the NSW DEC for this study are statistically similar and therefore we did not specifically account for school effects in our models, it would however, be fruitful for future research to examine school effects utilising multilevel models to test the SRSE since individuals are nested within schools.

Despite three decades of research extensively mapping the relationships between disengagement from school and demographic, institutional, and individual factors that contribute to it, less is known about the social process that contributes to the departure from school early. Ream and Rumberger (2008) acknowledge this deficit when they state that "some aspects of the survey research literature remain understudied—particularly the *social aspects of the process* that causes young people to leave school before they obtain their high school diplomas" (p.110). By focusing specifically on relationships students' have with significant others including parents, teachers and peers, the new SRSE scale provides the opportunity for future research to investigate what it is about these relationships that renders young people from low SES communities liable to disengage and influence their decisions to either stay or leave school early.

Interventions designed to enhance student engagement and high school completion need to be based on issues that are amenable to change, such as changes in the ways parents and teachers relate to students and what they say to them, or how students relate to their peers and the values they share. Thus, the longer-term goal is to understand the ways such social contextual factors might influence students' approaches to their schoolwork (cognitive engagement), their feelings about school (emotional engagement), and their attitudes to school participation and attendance (behavioural engagement). The SRSE scale presented in this paper provides an essential foundation that will support an exploration of these issues.

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Authors' Note

Ethics approval was sought and approved by two separate governmental organisations: (1) the University of Western Sydney Ethics Review Committee (Human Subjects); and (2) the Department of Education and Communities. In addition, the school principal gave approval for the project to run in their school. Following approval, parental permission was actively sought and only students with parental permission to participate were invited to participate. During participation, students were told about the purpose of the study by trained researchers and invited to participate based on informed consent.