School connection through engagement associated with grade scores and emotions of adolescents: four factors to build engagement in schools

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Abstract
This study investigated school connectedness, student engagement, academic grades, and student affect. Factor analyses of 331 adolescent students (Years 7, 9, and 11 in Australia), validated a four-factor model of school engagement. The factors revealed in the analyses were described as (1) future and task focus, (2) planning and motivation, (3) positive roles and models, and (4) positive social engagement. Cluster analyses revealed two typologies of students: a thriving group scoring significantly higher on all four factors than a striving group. There was a consistent number of students in each group across Years 7, 9 and 11. Compared to students in the striving group, on average, students in the thriving group scored significantly higher on grades (i.e., mathematics and English). Moreover, students in the thriving group were significantly higher on content and excited affects, and significantly less depressed and distressed compared to the students in the striving group. Limitations and implications for research and practice are discussed.

Keywords Connectedness · Engagement · Motivation, grades · Affect · Thriving

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1 Introduction

Research supports the connection between student engagement and outcomes such as achievement and school behaviour (Appleton et al., 2008; Jimerson et al., 2003; Upadyaya & Salmela-Aro, 2013). Research suggests that 20% of students in Australian schools (Hancock & Zubrick, 2015) and up to 25% of students in the United States (Brint & Cantwell, 2014) are reported as being consistently disengaged. The importance of engagement for the educational and general development of children and adolescents has been acknowledged in the literature for some time (Henderson & Mapp, 2002). For example, multinational research has shown that engagement is also associated with perceived instructional practices, perceived teacher support, perceived peer support, perceived parent support, positive emotions, negative emotions, academic performance, and school conduct (Lam et al., 2014). The central aim of this study is to better understand student engagement at school, including an investigation of student engagement profiles, to discern whether student outcomes (e.g., grades and emotions) may be associated with distinct student engagement profiles (Australian Institute of Teaching and School Leadership, 2013; Fredricks & McColskey, 2012). In this research, student engagement is conceptualised as a part of school connectedness informed by social cognitive theory (SCT).

Many divergent models and methods have been proposed to enhance student engagement. For example, evidence-based approaches have advocated for student and classroom management (Goss & Sonnemenn, 2017). These tend towards behavioural models exemplified in the work of Alberto and Troutman (2016) and O’Neill and Stephenson (2014), and a focus on behaviour management (Rogers, 2015). Other models that focus on motivation and outcome are demonstrated by Wigfield and Eccles’ (2000) expectancy-value model, but these remain relatively abstract. Other explanations focus on singular aspects of motivation associated with student engagement, such as a focus on emotion (Harley et al., 2019). While these models have been well researched, few have been developed explicitly to reflect a theoretical framework. Therefore, building a model based on a theoretical framework is the rationale for the current research.

Social cognitive theory encompasses personal, environmental, and behavioural factors relevant to any age and is one of the most comprehensive theories applicable to human functioning and agency (Bussey, 2018). This makes SCT particularly relevant to form the foundation for considering student connectedness, engagement, emotions, and achievement. Specifically, SCT (Bandura, 1986, 2012; Bembenutty et al., 2016) is based on triadic determinism in which personal factors (beliefs and expectations) interact with behavioural factors and environmental factors (e.g., social and physical; Cook & Artino 2016), making it a strong foundation from which to examine school engagement. SCT emphasises that learning occurs through reciprocal interactions between learners and experience, as learners observe and interact with others and the environment (Bandura, 2012; Cook & Artino, 2016). Using the SCT foundations, Bowles and Scull (2019) articulated four factors that define engagement: (1) future and task focus, (2) planning and motivation, (3) positive roles and models, and (4) positive social engagement. The specific aim of this research is to validate and measure this four-factor operationalisation of engagement, previ-
ously described by Bowles and Scull (2019), which integrates behavioural, affective and cognitive processes previously endorsed in the literature (Appleton et al., 2008; Froiland & Worrell, 2016; Jimerson et al., 2003). It is anticipated that this measure of engagement can be used to profile students’ engagement levels and contribute to further advancing methodological advances related to student engagement (Azevedo, 2015; D’Mello et al., 2017). Previous research provides the rationale and methods used to link engagement with the four factors (see Bowles & Scull 2019). The following sections briefly review the four components previously reported by Bowles & Scull (2019): (1) future and task focus, (2) planning and motivation, (3) positive roles and models, and (4) positive social engagement.

1.1 Future and task focus

How adolescents view their transition into their future has been in contention for decades. This transition has become more salient in recent years because the period spent in formal learning settings has become longer, and large portions of this time require compulsory attendance in schools, placing a large burden on schools to socialise students into rounded citizens (Biesta, 2009; e.g., Scottish Executive 2004). Early researchers proposed three processes by which adolescents apprehend and move into the future:

First, people set their goals based on comparisons between general motives and values and the knowledge they have about their anticipated life-span development. Second, after people have set their goals, planning activity is required in order to realize them. Knowledge about the expected context of future activities provides a basis for this planning. Finally, opportunities to realize the goals set and plans constructed are evaluated. (Nurmi, 1991, p. 4)

More recently, research has shown that connection to school is strongly predicted by a commitment to an educational future (Strolin-Goltzman et al., 2014). Importantly, Nurmi (1991, 1993) argued that as well as anticipating and being interested in their future outcomes, adolescents evaluate the potential outcomes relating to their personal standards through a schematic reference system of motives, interests, and tasks to fulfil towards these goals.

From an educational perspective, aligned with SCT, being focused on present tasks creates a future orientation. “By being represented cognitively in the present, conceived future events are converted into current motivators and regulators of behavior” (Bandura, 1989, p. 1179). Being task focused is also a feature of self-regulation (Schunk & DiBenedetto, 2015; Schunk & Zimmerman, 1994, 1998; Vasalampi et al., 2009; Zimmerman, 2002), which involves micro-behaviours of goal setting, planning and evaluating in the present and for the future at school (usually over years; Bowles 2008; Oyserman et al., 2004). Adolescents who flourish in school tend to be those whose motivations, future goals, and beliefs about achievement in future are activated with a high level of awareness of the future and time orientation (Bowles & Worrell, 2020), and cognitive engagement (Bowles, 1999; Jimerson et al., 2003). Research has also shown that future time perspectives predict (self-)regulatory pro-
cesses (De Bilde et al., 2011). An important feature of this alignment, of a commitment to an educational future and the social aspects of schooling (considered below), was a predictor of academic performance and grade promotion in previous research (Strolin-Goltzman et al., 2014).

1.2 Planning and motivation

Social cognitive theory emphasises the benefits to adolescents of planning and being motivated (Bandura, 2001). Planning is a central element of SCT and self-regulation (Schunk & Zimmerman, 1994, 1998; Zimmerman, 2002) and, as noted by Bandura, “Action is motivated and directed by cognized goals rather than drawn by remote aims. Forethought is translated into incentives and guides for action through the aid of self-regulatory mechanisms” (1989, p. 1179). Similarly, preparing well (Glanville & Wildhagen, 2007), planning, and remaining motivated more likely ensures that tasks are completed (Fredricks & McColskey, 2012) and supports change and learning (Bowles & Hattie, 2013; Bowles & Scull, 2018). Students’ agentic engagement in the transformative process of learning is considered an essential pathway to academic progress (Molinari & Mameli, 2018, Reeve, 2013).

Researchers have shown that complex tasks link future goals to learning through a sequence of dependent and intermediary steps that facilitate learning (Schuitema et al., 2014). Such tasks should focus on the achievement of personal best goals (Martin & Elliot, 2016a) and mastery goals over demonstrating achievement relative to others (Martin & Elliot, 2016b), and a focus on the process towards completing tasks and goals (Bowles, 2008; Fredricks & McColskey, 2012). Throughout this process, the individual student ideally moves from externally motivated to internally motivated as new educational topics, goals, standards, and values are introduced and negotiated by teachers (Deci & Ryan, 1985, 2000).

Over time, in contexts such as schools, “Through socialization, the normative expectations of important reference groups are internalized in the form of self-evaluative standards” (Blanton & Christie, 2003; p. 125). These self-evaluative standards function to mould students’ perception of goals and how to achieve them (Bowles & Scull, 2018). This link between goal setting and adoption of social norms works for both formal and informal learning contexts where adaptive and prosocial behaviours, as well as antisocial delinquent behaviours, may be learned (Brindle et al., 2019; Carroll et al., 2001). Correspondingly, disengagement is characterised as an absence of generative, adaptive learning strategies (Tadich et al., 2007). However, research has shown that students with low motivation can be effectively re-engaged with a well-aligned intervention (Peetsma and Van der Veen, 2015). In short, understanding fine-grained plans and motivations can provide pathways to the achievement of goals into the imagined future.

1.3 Positive roles and models

According to SCT, learning occurs through a process of observation of a model performing behaviours; that is, the sequence of events, context and consequences of the behaviour, which the observer may mimic in future (Bandura, 1986). A role model
School connection through engagement associated with grade scores… is a “cognitive construction based on the attributes of people in social roles an individual perceives to be similar to him or herself to some extent and desires to increase perceived similarity by emulating those attributes” (Gibson, 2004, p. 136); or, simply, “individuals admired for their ways of being and acting” (Cote & Leclere, 2000, p. 1117).

At the institutional level, positive role models provide opportunities for the learner to observe, learn from, and imitate other learners and leaders within a specific social environment to foster association and engagement, and to provide support (e.g., family members, peers and teachers; Grier-Reed et al., 2012). In school settings, the modelling of specific behaviours associated with content, as well as the important social nuances that accompany the message to be learned, are observed by students (Bandura, 1988). Both what is explicitly and implicitly taught and intuitively and symbolically expressed from the nuances of communication affirm the values and behaviours expected within the culture of the school, as exemplified by staff leaders and models (Bandura, 2001). Similarly, role models may be peers, or more senior students, or influential adults and family members.

For adolescents, identifying with role models occurs in available social networks, traditionally from institutions such as school. Where there is a good fit between the school and adolescent, the language, values and ideals expressed by adult role models influence the individual’s and group’s identification with the social norms of the school. In some communities and schools, role models are considered ideal forms and represent exemplars of community norms that are powerful and accessible and may become private self-guides that are identified and shared with others (Moretti & Higgins, 1999) and manifest symbolically as role models (Blanton & Christie, 2003). The power of role models with whom adolescents align to facilitate their engagement with their future selves (Brown & Treviño, 2014) and connection to school is deserving of further research.

1.4 Positive social engagement

From a SCT perspective, there are three major modes of agency – one references personal agency exercised individually, and two are prosocial, based on positive social engagement with others; “proxy agency in which people secure desired outcomes by influencing others to act on their behalf; and collective agency in which people act in concert to shape their future” (Bandura, 2002, p. 269). Relationships based on positive social engagement are central in mediating the transition to adulthood, most potently so when the individual has been rejected or excluded by peers or significant others (Baumeister & Tice, 1990; Peetsma, 2000; Peetsma & van der Veen, 2011). The importance of social relationships in assisting adolescents to remain engaged and manage the present and transition to the future has been established in previous research (Baumeister & DeWall, 2005; Nouwen & Clycq, 2019; Twenge et al., 2003). Further, research into adolescents’ future orientations has shown a strong relationship with positive social support (r = .52) and negative social support (-0.27; Bowles 2008).

Social connectedness is a powerful source of adjustment in schools, represented symbolically through relationships with significant others (Allen & Bowles, 2012),
while satisfying the social need to be part of the institution requires the development of a social network of like individuals (Baumeister & Leary, 1995) in which the student can be accepted, respected and supported by staff and student friends (Ulmanen et al., 2016). In school contexts, this occurs in active involvement in classroom activities (St-Amand et al., 2017), out-of-school activities (Eccles & Templeton, 2002) and general school involvement and interacting with significant others in school settings (Libbey, 2004, 2007). However, this can be complex as there is great variability in the type and quality of relations with peers and teachers (Virtanen et al., 2016).

Identification with and conformity to the dominant group and school usually leads to considerable benefits but comes at the cost of maintaining the norms of the group as expressed explicitly in actions and behaviours (e.g., achievements, ambitions, dress) and the possible fear of being shunned and rejected (Blanton and Christie, 2003). The desire to avoid disapproval prompts conformity to normative expectations of others, even when they are not part of the immediate social environment, such as the school. Similarly, positive social engagement with others and role models, and identification with them and the groups from which they come and the norms or internalised guides they express, promote conformity and the benchmarks from which to establish how closely we fit with the group with which we aspire to belong, or not.

1.5 Engagement, grade scores, and affect

Student engagement, including issues of attendance, have been consistently linked with educational outcomes such as promotion to the next grade and grade point average (Høigaard et al., 2015; Strolin-Goltzman et al., 2014), although a causal or linear relationship is difficult to establish. Further, connection to school in adolescence is associated with teacher relationships, with teacher closeness being associated with increased academic performance (Longobardi et al., 2016). In research conducted by Liew et al., (2010), a positive student-teacher relationship was a compensatory factor in assisting students with low task accuracy to achieve as well as those with high task accuracy. These authors suggest a positive student-teacher relationship improves future achievement, especially for students with low effort or control on specific learning tasks. Finally, future time orientation as a construct similar to future orientation has been associated with self-reported English and mathematics grade scores (Bowles, 2008).

Emotions are generally important for adolescents as they have a profound role in motivating them to engage or disengage (Linnenbrink-Garcia & Pekrun, 2011; Spruit et al., 2016). Emotions work in a complex manner to self-protect, self-enhance and motivate the individual (Leary, 2007). Adolescence is a key time when many emotions are rapidly changing, and the cognitive processes required to process them are also going through development (Yurgelun-Todd, 2007). McGraw and colleagues (2008) investigated relationships, school connectedness, and emotions in the final year of secondary school in a large Australian sample. They found that high negative affect – depression and anxiety and stress – was associated with lower levels of family peer and school connectedness. Negative affect one year later was predicted by negative affect associated with peer connectedness at time one. The researchers concluded that students who feel lonely and disconnected also have elevated levels
of depression, anxiety, and stress. Managing negative emotions, particularly guilt and then shame, plays a role in reducing delinquency (Spruit et al., 2016). Previous research has shown that students who were positive scored significantly higher than optimists, and their scores were significantly higher than pessimists and negative students on school grade, academic self-ranking, attitude to teachers, attitude to school, and school absence (Alansari et al., 2013).

Pekrun and Linnenbrink-Garcia (2012, p. 278) recommend that “researchers conducting research on emotions in educational settings to be clear about how they define emotions within the context of education and to carefully match the theoretical conceptualization of emotions with their assessment instruments”. Therefore, the well-researched circumflex model, originally described by Russell (1980) and later by Plutchik and Conte (1997), was selected to guide the measure of emotions. While the most rudimentary separation of emotions is positive and negative (Laurent et al., 1999), a four-factor model can be generated from the circumflex emotion quadrants that are defined by Russell (1980) as the positive affects of content and excited and the negative affects of depressive and distressed. In this research, it is expected that the four factors of engagement will be positively associated with grade scores and positive affects and negatively associated with the negative affects.

1.6 Grouping students (clusters)

Clusters analysis provides an opportunity to identify previously undetected subgroups to emerge from the sample. Unlike other variable-oriented research, cluster procedures use combinations of factors to define profiles of students. Previous studies have used similar factors and cluster procedure. Previously person-oriented approaches have been used to establish profiles of students on a variety of engagement, motivational, affective, and social factors (Salmela-Aro et al., 2016). These researchers measured 12-year-old students’ engagement, exhaustion, cynicism, and inadequacy, and five profiles of students emerged. The groups were: Engaged (50%); Stressed (4%), High in Cynicism (burnout group, 5%); Moderate in Cynicism (15%), and Emerging Cynicism (bored group, 26%; disengaged cynical were 46%). De Staasio and Di Chiacchio (2015) clustered student scores from senior high school on 14 factors (7 cognitive and 7 affective), and three clusters emerged, defined as Effective Students, Demotivated, Disoriented and Detached Students. In contrast, Juang and Silbereisen (2002) generated four clusters based on students’ perceptions of cognitive ability (CA) and parental involvement (PI). The largest group was the High CA/High PI (44%), followed by High CA/ Low PI (27%), the Low CA/Hi PI (17%) and a Low CA/Low PI group (12%). In another study, León and Liew (2017) profiled middle high-school-aged adolescents’ peer and teacher relatedness and defined four profiles of students: Low Peers-Low Teacher (7%), Moderate Peers-Low Teacher (8%), Moderate Peers-Moderate Teacher (51%), High Peers-High Teachers (31%). Finally, Hayenga & Corpus (2010) clustered intrinsic and extrinsic motivation and GPA at two time points (Fall/Spring), and four clusters emerged on two poles. The clusters were: High (33/23%), Good (19/16%), Poor (20/28%), and Low (28/33%). In conclusion, clusters procedure has previously generated between three or four groups of students that vary significantly on engagement, motivational, affective and
social factors. One unique aspect of this research is the use of cluster analysis with four factors of engagement from a SCT framework and defining the profiles of the subgroups in the sample.

Based on the clusters of students on engagement, motivational, affective and social factors, it is possible that similar profiles will emerge if the four factors defining engagement are clustered. Therefore, from an SCT perspective, four factors of engagement have been defined: Future and Task Focus (having a path to the future); Positive Roles and Models (knowledge of and respecting successful older role models); Planning and Evaluating (ability to plan and act thoughtfully), and Positive Social Engagement (ability to fit in in the present and in future and commitment to friends). These four factors will be used to develop clusters or profiles of students and compare with ratings of emotions and grade scores.

1.7 Key questions to be examined in the present study

The research questions examined in this study included:

1. Will the four factors representing engagement, summarised from the literature of (1) future time perspective, (2) positive role and models, (3) social and (4) planning, form statistically sound factors?
2. Are there underlying groups that can be defined by clustering the engagement factors to be used to group students into 3–4 meaningful groups?
3. Is there an association between the motivational factors of engagement and affects of Content, Excitement, Distress and Depression?
4. Do the math grade scores and English grade scores differ between the groups based on engagement scores’ year level and gender?
5. Do the four affect scores and English grade scores vary between the groups based on engagement scores’ year level and gender?
6. Do the number of students in each cluster remain constant across year level/age?

2 Methods

2.1 Participants

A convenience sample of 331 adolescent students from an urban secondary school in the outer suburbs of Melbourne, Australia, participated in this research. Of these, 173 were female (mean age of 14.64; $SD=0.13$) and 158 males (mean age of 14.22; $SD=0.14$). The respondents were from Year 7 (mean age of 12.38; $SD=0.52$), Year 9 (mean age of 14.50; $SD=0.50$), and Year 11 (mean age of 16.37; $SD=0.60$).

2.2 Measures

Engagement Questionnaire. The items for the Engagement Questionnaire were derived from the terms associated with engagement in previous research (Bowles & Scull, 2019). A battery of 66 items were developed to represent the four factors.
They are exemplified by: Future and Task Focus, (e.g., “My whole secondary school experience is a good foundation for whatever I do in future”); Positive Roles and Models (e.g., “I know a couple of special people I’d like to be like when I get older”); Positive Social Engagement (e.g., “I always seem to fit in and will in future”); and Planning and Evaluating (e.g., “Sometimes I think so much about the present that I get stuck”). Over half of the items were excluded due to being skewed or kurtotic. Of those that remained, 21 items were selected as statistically sound and conceptually relevant and contributing singularly to one of the four factors (see Table 1).

The questionnaire invitation statement was: “Below you will find a number of statements about how connected you are with school. Please read each statement carefully and indicate how much you agree with each statement by circling one of the numbers after each statement.” The items were rated on a Likert-type scale with Strongly disagree (1), Moderately disagree (2), Mildly disagree (3) Mildly agree (4), Moderately agree (5), Strongly agree (6). The items contributing to Planning and Motivation were reversed in analyses.

Affect Questionnaire. The items of the Affect Scale were previously defined by Russell (1980). The questionnaire invitation statement was: “Please tick the box under the heading that most correctly describes how you feel ...”. The individual items were associated with Being Content, operationalised by ratings of relaxed, satisfied, content, calm, and at ease. Similarly, Distressed was defined by ratings of tense, angry, annoyed, distressed, and frustrated. The Depressive factor was operationalised by ratings of sad, miserable, bored, depressed, and gloomy. The fourth factor of Excited was defined by ratings of pleased, happy, glad, excited, and delighted. Each of the affects was rated on a Likert-type scale with Strongly disagree (1), Moderately disagree, (2), Mildly disagree (3) Mildly agree (4), Moderately agree (5), Strongly agree (6). Cronbach’s for the emotion factors are shown in Table 2.

Grade Scores. With consent from parents and students, grade scores for mathematics and English were provided. The achievement scores were converted to numbers (i.e., 01=E, 02=E+, 03=D, 04=D+, 05=C, 06=C+, 07=B, 08=B+, 09=A, 10=A+).

All data were gathered in accordance with the ethical guidelines of the NHMRC guidelines and the Ethics Committee of the Australian Catholic University, Melbourne, Australia. School, parent and student consent was obtained prior to gathering the data.

3 Results

3.1 Investigating the factor structure of the measure

The first analysis was to conduct an exploratory factor analysis with maximum likelihood and oblique rotation, which revealed a Kaiser-Meyer-Olkin’s (KMO) measure of sampling adequacy of 0.85, and Bartlett’s test of sphericity was also adequate: $\chi^2 (N=331, df=210) = 1979.78, p = .001$ (Coakes & Ong, 2011; Field, 2009). The KMO measure of sampling adequacy assesses how much, as a whole, the variables were correlated (Hair, Black, Babin, Anderson, and Tatham., 2010). It was important that
the KMO value was at least 0.50 for factorability (Coakes & Ong, 2011). In the present research, the KMO was 0.85, which indicates a high amount of shared variance (Hair et al., 2010). Therefore, the KMO and Bartlett’s test of sphericity suggests that sampling adequacy has been achieved and exploratory factor analysis can proceed (Tabachnick & Fidell, 2013).

Examination of the scree plot indicated that the four-factor solution was appropriate. After deletion of items that had low communalities and cross-factor loadings, the final solution is shown in Table 1. As expected, the content of four factors that emerged corresponded with the factors derived from the previous research. The factors names and corresponding items are shown in Table 1.

3.2 Investigating the relationship between Engagement factors, grades, and affect

The relationship between the four engagement factors with the two grade score factors for English and mathematics and four factors of emotion are shown in Table 2.
Consistent with previous findings, grade scores have a relatively low correlations with the Engagement factors. English grades were most highly correlated with maths grades, and other associations were small. Similarly, distress and depression were relatively highly correlated. The remainder of the correlations were moderate to low, indicating relative independence of the anticipated link. The Cronbach’s alpha coefficients were satisfactory as they were between 0.70 and 0.77 for the engagement factors and 0.63 and 0.84 of the affect factors.

Typologies were generated to establish whether, within the students, there were naturally occurring groups on the basis of the four factors of the engagement. Following standard procedures for calculating a K-means, a hierarchical cluster procedure (see Everitt et al., 2001; MacCallum et al., 2002) was completed using the scores from the four factors of the engagement. Examination of the dendrograms and agglomeration schedule of the two-, three- and four-group solutions indicated that the best solution with the clearest separation of groups was the two-cluster solution (Everitt et al., 2001; see Table 3). The two-cluster solution indicated that half of the respondents were consistently high on the engagement factors, named the Thriving group ($n=164; 49.54\%$), and a second group with significantly lower scores was named the Striving group ($n=167; 50.45\%$). The multivariate result was significant for cluster grouping with Pillai’s trace=$0.69$, $F=143.87$, $df=(5,325)$, $p=.001$; $\eta^2=0.69$ (Table 3; Fig. 1).

### 3.3 Investigating the year level and gender differences between engagement clusters

To establish whether grade scores and affects vary in relation to the two groups of students, a between-groups multivariate analysis of variance (MANOVA) was used to test the difference between groups. In the initial analysis, gender (males and females) and year level (Years 7, 9, and 11) were included as instrumental variables (IVs); however, there were no interactions involving gender and year level with factors so grade scores and affects were analysed with the individual IVs (Table 4; Fig. 2).

The MANOVA investigating academic grades and affects by engagement cluster and gender resulted in a nonsignificant result for gender. Similarly, the univariate analysis showed that grade scores and affects did not vary by gender. A second MANOVA without gender as an IV was rerun. The multivariate result was significant for cluster grouping by affects and grade scores with Pillai’s trace=$0.28$, $F(6, 324) = 21.08, p=.001$; $\eta^2=0.28$. The univariate analyses showed that all four affects were significantly different between cluster groups, with the Thriving group higher than the Striving group for positive affects and the reverse for the negative affects. Similarly, the grade scores were significantly higher for the thriving group in comparison with the striving group (Table 4). The magnitude of the difference is represented as standardised scores, as shown in Fig. 2.

To analyse the association of the Engagement clusters and year levels, a chi-square analysis was completed, and the results indicated that there was no association between the cluster and year level of respondents, $\chi^2(2,331)=0.057, p=.972$; $\eta^2=0.13$ (Table 5). The number of students within each group remained relatively consistent from Year 7 to 9 to 11 (Table 5; Fig. 3).
|     | 1       | 2       | 3       | 4       | 5       | 6       | 7       | 8       | 9       | 10      | 11      |
|-----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1   | Future and Task Focus | 1 | 0.35** | 0.50** | 0.25** | 0.76** | 0.25** | 0.22** | 0.51** | 0.55** | −0.41** | −0.29** |
| 2   | Positive Role Model | 1 | 0.35** | 0.50** | 0.03   | 0.59** | 0.04   | 0.01   | 0.26** | 0.32** | −0.11*  | −0.03   |
| 3   | Positive Social Engagement | 1 | 0.27** | 0.77** | 0.07   | 0.04   | 0.42** | 0.48** | −0.39** | −0.26** |         |         |
| 4   | Planning & Motivation (-) | 1 | 0.59** | 0.13*  | 0.05   | 0.28** | 0.24** | 0.47** | −0.47** | −0.41** |         |         |
| 5   | Total Engagement | 1 | 0.18*  | 0.12*  | 0.54** | 0.58** |         |         | −0.52** | −0.37** |         |         |
| 6   | English Grade | 1 | 0.60** | 0.23** | 0.16*  |         |         |         | −0.17*  | −0.20** |         |         |
| 7   | Math Grade | 1 | 0.19** | 0.14*  | 0.09   |         |         |         |         |         | −0.17*  |         |
| 8   | Content | 1 | 0.77** |         | −0.44** | −0.44** |         |         |         |         |         |         |
| 9   | Excitement | 1 |         | −0.44** | −0.36** |         |         |         |         |         |         |         |
| 10  | Depression | 1 |         | 0.77** |         |         |         |         |         |         |         |         |
| 11  | Distress | 1 |         |         |         |         |         |         |         |         |         |         |
| Mean | 4.55 | 4.76 | 4.75 | 3.73 | 4.47 | 5.77 | 6.53 | 3.92 | 4.02 | 2.83 | 3.18 |
| SD  | 0.84 | 0.88 | 0.74 | 1.01 | 0.58 | 1.46 | 1.55 | 0.94 | 1.02 | 1.14 | 1.09 |
| Cronbach’s alpha | 0.77 | 0.77 | 0.71 | 0.73 | 0.82 | 0.81 | 0.73 | 0.77 | 0.87 | 0.84 | 0.82 |

Note: **Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2-tailed); n=331
4 Discussion

4.1 Summary

Applying a SCT perspective (Bandura, 1986, 2012; Bembenutty et al., 2016), this research set out to examine how the four factors could be defined to establish profiles. The factor analysis showed the relative independence of the factors and strong cohesion to a total score, with correlations of greater than .59 and a Cronbach’s alpha coefficient of 0.82. The profile clusters of students pro-
vided two groups (i.e., striving and thriving), who were significantly different on the four factors of engagement. These two groups were significantly different on English and math grade scores, and the four affects (i.e., content, excited, depressive, distressed). Analyses comparing age groups of students (Years 7, 9, and 11) revealed no differences in the number of students in the thriving group or the striving. The research advances the utility of SCT (Bandura, 1986, 2012; Bembenutty et al., 2016) and its application in school settings.
4.2 Four-factor structure

The four factors revealed in the current study were consistent with previous research (Bowles & Scull, 2018). An evaluation of the items associated with each factor indicates that Future and Task Focus is defined as being able to see how school and making an effort helps to provide a pathway into the future. The factor of Positive Roles and Models is defined as knowledge of and respect for successful role models and their activities. Positive Social Engagement is defined as the ability to fit into groups socially in the present and in future, with commitments to friends and tasks. Planning and Motivation is defined as the capacity to prepare, set goals and focus on the tasks to be completed with interest and free of anxiety. In the most general sense, students who are engaged with their school are influenced by the culture of their school (Moretti & Higgins, 1999) and share in a way of seeing and making meaning of the past, present and future (Nurmi, 1993).

4.3 Thriving and striving students

Consistent with previous research, the general pattern of means revealed that the Thriving group was higher scoring than the Striving group on math and English grade scores (Strolin-Goltzman et al., 2014) and was more positive on content and excited affects than the Striving group (McGraw et al., 2008; Spruit et al., 2016). The Thriving group was also significantly lower on negative affect. The association between engagement factors and emotions conforms with the discussion of the circumplex model of emotions and engagement (Pekrun & Linnenbrink-Garcia, 2012) and engagement. These results provide further validity for the four factors of interest. The results also generally affirm the link with self-regulation (Schunk & DiBenedetto, 2015; Schunk & Zimmerman, 1994, 1998; Vasalampi et al., 2009; Zimmerman, 2002); for example, the capacity to set goals and plans is associated with achievement (Bowles, 2008; Oyserman et al., 2004). The Thriving group is more likely to flourish in school (Jimerson et al., 2003). The four factors may be used to identify students who could be assisted to benefit more from school engagement and connection.

The differentiation of students into two groups based on the four factors aligns with previous research; the 50% of the students in this study fitting in the thriving group corresponds with the previous European research of Salmela-Aro et al., (2016), which showed that 50% of students were engaged and 46% of students were cynically disengaged from school, and provides evidence that these factors may have utility in schools. Ensuring curricula and extra-curricula activities prime and prompt students to consider their future and task focus, and providing positive role models they may aspire to emulate and possibly negative role models they learn from (Lockwood et al., 2004) may positively influence their school experience. Further research is warranted on curricula focused on facilitating appropriate study habits founded on planning and motivation and encouraging positive social engagement to increase the number of thriving students in schools. To ameliorate disengagement and disenfranchisement, schools and organisations associated with adolescents (e.g., sport clubs, recreation clubs) may further focus on the factors that advance connectedness.
(Bowles & Scull, 2019) and broaden and build strategies to enhance positive emotions and experiences (Tugade & Fredrickson, 2007).

Identifying that students are not engaged is a first step in assisting them; it is too easy to say that students need to be re-engaged. The analysis of the pathway of students who are not engaged needs to be dealt with particularly sensitively. Students who are experiencing rejection (Baumeister et al., 2003), profound loneliness (Wiseman et al., 2006) or mental health vulnerabilities need to be treated carefully and specially. Similarly, students whose identities are in a state of foreclosure, moratorium or diffusion need time and care in different ways to allow them to achieve a well-adjusted identity status (Padilla-Walker et al., 2008). Each of these types of disengagement should be considered as opportunities to support adolescence in a formative fashion as they progress to adulthood.

4.4 Limitations and future directions

There are limitations to this research that prompt future research. First, the analysis is exploratory and further research needs to be undertaken to confirm the factor structure and the findings here. Second, further validation of the factors in comparison with similar factors needs to be undertaken. Third, the sample is from one school and therefore the analysis needs to be repeated in multiple schools with different socio-economic and geographic backgrounds. Fourth, the model defined by this research provides a contrast to the extant models associated with prompting engagement in students. None of the models described in the introduction provide such a strong

Fig. 4 The factors contributing to school engagement
conceptual focus that can be as easily be built into the school curriculum. Fifth, the direction of the link between engagement, achievement and emotion and its reciprocal nature (Pekrun, 2006) requires further investigation. Finally, the value of these constructs is in their capacity to be applied in school settings to assist students to be more engaged, hence longitudinal and cross-lagged designs would demonstrate the applied utility of the constructs. Future research should address each of these issues and further validate the structure of the factors (Fig. 4) and items through confirmatory factor analysis.

4.5 Conclusions

In conclusion, this study adds to the current knowledge of adolescent engagement by validating a model of engagement based on a summary of key definitions and engagement. Importantly, these four factors are new and conceptually accessible to school students and staff. The four factors are pertinent to curriculum material, social and pastoral activities, as well as personal and social development activities. Establishing the relevance of curriculum material for different ages of adolescents would also be useful. The four factors are clearly associated with students’ affects and grade scores, and further research investigating the link other aspects of student life will inform the value of the engagement factors. As the factors are novel, training of teaching staff and student support staff in their application would enhance their potential utility.

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**Declarations**

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