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Autonomy support and students' perceived social-emotional competence: predicting parent-reported social-emotional skills

Rebecca J. Collie[1] · **Richard M. Ryan**[2]

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Abstract

In this study, we investigated perceived social-emotional competence (PSEC) among 373 Australian secondary school students in relation to parent ratings of social-emotional skills, and perceived teacher and parental autonomy support. Using bifactor exploratory structural equation modelling, we examined five dimensions of PSEC (perceived competence for assertiveness, tolerance, social regulation, emotion regulation, and emotional awareness), identifying a global factor and five specific factors. Following that, we employed structural equation modelling to investigate links between these global and specific factors and five parent-reported social-emotional skills: leadership, cultural competence, teamwork, cognitive reappraisal, and capacity for emotional reflection. Global PSEC was associated positively with all skills, whereas the specific factors were, with one exception, each associated with greater parent-rated skill in a corresponding area (e.g., assertiveness with greater leadership skill; emotion awareness with reflective skills). Addressing a second aim of the research, we tested the extent to which students' perceptions of autonomy support from teachers and parents assessed near the start of a school term were associated with both students' PSEC and parent-rated skills assessed at the end of the term. Autonomy-supportive parenting was positively associated with global PSEC. Autonomy-supportive teaching was associated with greater levels of two specific factors: perceived competence for assertiveness and social regulation. Together, findings hold relevance to knowledge and efforts aimed at enhancing social-emotional skills among students.

Keywords Social-emotional competence · Perceived competence · Autonomy-support · Social-emotional skills

✉ Rebecca J. Collie
rebecca.collie@unsw.edu.au

[1] School of Education, University of New South Wales, Sydney, Australia

[2] Institute for Positive Psychology and Education, Australian Catholic University, Sydney, Australia

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1 Introduction

Growing research is demonstrating the significance of students' social-emotional competence (SEC) for adaptive functioning in schools (Guo et al., 2023; Ng, 2023; Rose-Krasnor & Denham, 2009; Stump et al., 2009). Although SEC has been variously characterized, definitions generally include the knowledge and skills to manage one's emotions, make good decisions, select and achieve goals, understand others, and be effective in social interactions (e.g., Eisenberg et al., 2015; Saarni et al., 2006). These social-emotional competencies represent essential tools for both self and social development and are arguably as important to students' future adaptation and career success as their more traditionally emphasized academic competencies.

An emerging body of work is investigating the role of students' perceived social-emotional competence in relation to important outcomes, including well-being, adaptive behaviors, and social-emotional skills (e.g., Bigman et al., 2016; Caprara et al., 2008; Demkowicz et al., 2024). Perceived competence regarding emotion regulation and social functioning would be important in enabling students to exercise skills and self-regulation. Accordingly, Collie (2020) introduced a measure of *perceived social-emotional competence* (PSEC) to assess an individual's confidence in having the skills and capabilities for navigating social interactions and emotional experiences. In this initial research, PSEC was positively associated with well-being, autonomous and internalized motivation, prosocial behavior, and negatively with conduct problems.

In the present study we extend the research on PSEC in two principal ways. First, a comprehensive examination of PSEC in relation to other-rated social-emotional skills has yet to be conducted. Prior work has examined PSEC only in relation to one or two interpersonal or intrapersonal skills (Collie et al., 2024), rather than a wider array of social-emotional skills. This gap is important to address as it will lead to better knowledge of the construct of PSEC, including its nomological network, and could also guide direction for practical efforts by revealing which PSEC dimensions are uniquely associated with different skills. Second, within self-determination theory (SDT; Ryan & Deci, 2017) it has been hypothesized that autonomy supportive teaching and parenting enhance social-emotional functioning and resilience (e.g., Wu et al., 2023). In the current research, we thus investigate the potential contributions of autonomy support from both teachers and parents to PSEC and the social-emotional skills associated with it.

To accomplish these two aims, we first examined five dimensions of PSEC (perceived competence for assertiveness, tolerance, social regulation, emotion regulation, and emotional awareness) using a bifactor approach, which involves a global factor of students' broad sense of PSEC, and specific factors representing unique aspects distinct to each dimension (Collie, 2022b). We then assessed the associations of these global and specific factors from the PSEC dimensions with parent-reported social-emotional skills, each skill chosen to map onto one dimension of PSEC. Specifically, parents reported on their child's leadership skills, cultural competence, teamwork skills, cognitive reappraisal skills, and emotional

reflection skills. Finally, we assessed both teacher and parental autonomy support at the start of a school term to serve as predictors of the global and specific factors of PSEC that were assessed at the end of the school term. In turn, all those factors were investigated as predictors of the parent-reported social-emotional skills, also assessed at the end of the school term. Figure 1 shows our hypothesized model.

1.1 Conceptual framework: the SEC school model

Numerous models of social-emotional factors have been introduced in the literature (e.g., CASEL, 2020; OECD, 2021; Pellegrino & Hilton, 2012; Soto et al., 2022). These models concentrate on the different social-emotional skills and behaviors that students experience and thus provide critical knowledge of salient social-emotional phenomena. In the current study, we sought to examine the processes that underpin or support students' deployment of social-emotional skills. As a result, we harness the SEC School Model (Collie, 2020), which is a process framework that draws together theoretical understanding and empirical support from the SEC literature (Rose-Krasnor & Denham, 2009) and SDT (Ryan & Deci, 2017). Specifically, the SEC School Model describes the process of how social-emotional outcomes are promoted—that is, the contextual and motivation factors implicated in skill and behavioral outcomes (see also Feraco et al., 2023 for a process model that focuses on the reverse process of skills as a predictor of motivation).

A key pathway in the SEC School Model is that the context in which an individual is operating can help to facilitate greater social-emotional motivation, which is in turn linked with more adaptive outcomes. In the SEC School Model, need-supportive teaching practices are those that support students' satisfaction of the basic psychological needs of autonomy, competence, and relatedness. In the present study, we focused on one type of need-support—autonomy-support (described in detail below). Students rated their experience of autonomy support from both teachers and parents. We examined both types of autonomy support as predictors of PSEC (a motivational factor; described in detail below) and, in turn, parent-rated

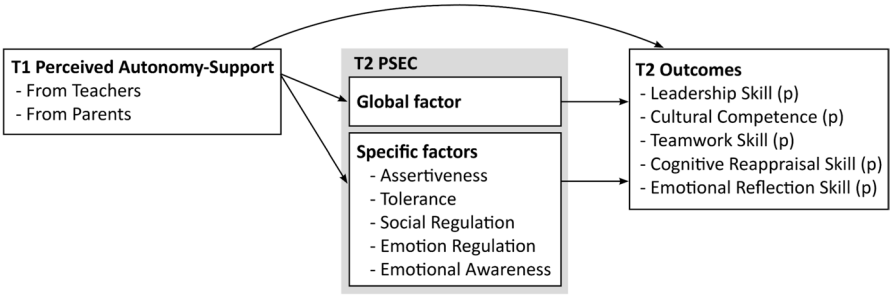

Fig. 1 Hypothesized model. *Note* The global factor of perceived social-emotional competence (PSEC) represents a broad, underlying sense of competence related to social-emotional phenomena. The specific factors represent unique aspects of PSEC. (p) = parent-reported factor. All other factors were student reported

social-emotional skills. The process from autonomy-supportive practices to perceived competence and skills is a key pathway in SDT—one that is supported by experimental and longitudinal research in the academic domain (e.g., Cheon et al., 2018) and, more recently, by cross-sectional research examining teacher autonomy support and PSEC (e.g., Collie et al., 2024). We investigated this process in relation to the social-emotional domain in the current study and across two timepoints (see Fig. 1).

1.2 Perceived social-emotional competence (PSEC)

PSEC reflects an individual's self-assessment of being capable in navigating their social-emotional experiences and interactions (Collie, 2020; cf. White, 1959). For example, PSEC might involve a student feeling capable to resist engaging in disruptive behavior in order to align with expectations in the classroom, or it might involve them feeling effective in regulating undesired emotions about an assignment (e.g., frustration). In motivation theorizing, PSEC is considered a domain-specific form of perceived competence, which is essential for both engagement and well-being (e.g., Ryan & Deci, 2017; White, 1959). Perceived competence stimulates personal growth and the initiation of actions, as those who believe in their capabilities are more inclined to engage in activities that reflect this belief (Ryan & Moller, 2017).

Notably, there are other cognate constructs that also capture capability self-beliefs, such as self-efficacy (i.e., confidence that one will be able to successfully undertake a specific, upcoming task; Bandura, 2001) and expectancies for success (i.e., expectations of success for a future outcome; Eccles & Wigfield, 2020). There is affinity between these constructs. However, they do differ in their focus. Perceived competence concerns a general sense of effectiveness in relation to a context or domain, whereas self-efficacy and expectancies denote confidence relating to a specific, future task or outcome (Bandura, 2001; Eccles & Wigfield, 2020). In our study, we examined perceived competence because we were focused on individuals' general perceptions related to the social-emotional domain rather than their self-beliefs concerning to an upcoming task. Importantly, and despite their differences, the constructs are located in several motivation theories as essential intervening factors that connect contextual resources and adaptive outcomes (e.g., SDT, Ryan & Deci, 2017; social-cognitive theory, Bandura, 2001; situated expectancy-value theory, Eccles & Wigfield, 2020). Thus, capability self-beliefs like perceived competence are expected to be impacted by contextual factors and to in turn impact adaptive outcomes such as skills.

Past researchers have investigated different dimensions of PSEC, capturing self-beliefs about various social-emotional capacities. For instance, perceived competence for emotion regulation involves feeling capable to shift one's emotions (Bigman et al., 2016; Caprara et al., 2008; Demkowicz et al., 2024; Parise et al., 2019), and perceived competence for conflict resolution represents feeling competent to constructively settle differences or disputes with others (Collie, 2022a). In other work, a more expansive concept of perceived social competence has been examined, encompassing several major facets of social interactions (Kristensen et al., 2022).

Collie (2022b) more recently pinpointed five distinct dimensions. *Perceived competence for assertiveness* entails feeling competent to speak up for oneself and others, and to assert one's rights or views (Collie, 2022b; cf. Chernyshenko et al., 2019). *Perceived competence for tolerance* refers to feeling capable of maintaining an open mind and showing respect towards a variety of perspectives and individuals (Collie, 2022b; cf. Chernyshenko et al., 2019). *Perceived competence for social regulation* implies feeling able to adjust one's actions to adhere to the societal norms of various situations (Collie, 2022b). *Perceived competence for emotion regulation* refers to feeling capable of adjusting one's thought processes to experience desired emotions as needed (fewer negative or more positive emotions; Collie, 2022b; cf. Gross & John, 2003). *Perceived competence for emotional awareness* implies the sense of being able to identify and label any emotions one might be experiencing (Collie, 2022b; cf. Smith et al., 2019).

The five PSEC dimensions reflect factors recognized in OECD (2021) and CASEL (2020) frameworks introduced above. An important difference, however, is that whereas the OECD and CASEL frameworks consider social-emotional skills and behaviors, the PSEC dimensions are concerned with self-belief. Taking that difference into account, it is possible to see that perceived competence for assertiveness has parallels with the skills of engaging with others from the OECD framework and self-awareness from the CASEL framework; perceived competence for tolerance has parallels with the OECD's open-mindedness/collaboration and CASEL's social awareness/relationship skills; perceived competence for social regulation has parallels with the OECD's task performance and CASEL's self-management/responsible decision-making; perceived competence for emotion regulation has parallels with the OECD's emotion regulation and CASEL's self-management/responsible decision-making; and, perceived competence for emotional awareness has parallels with the OECD's meta-cognition and CASEL's self-awareness (see Collie, 2022b).

Modeling PSEC with a bifactor approach, Collie (2022b) showed that its five dimensions can be represented among adolescents through global and specific factors. In this bifactor approach, the global factor is interpreted as a person's broad, underlying understanding of their capacities related to social-emotional experiences—that is, their perceived competence towards social-emotional phenomena in general (Collie, 2022b). This global factor undergirds and influences the specific factors, which signify unique facets particular to each dimension beyond any commonality captured by the global factor (Collie, 2022b). More precisely, specific factors represent perceived competence in relation to unique dimensions that are not fully explained by the global factor, providing a potentially more nuanced understanding of a person's social-emotional capacities. This bifactor approach resonates with Cattell's (1946) theoretical work on source and surface factors. Source factors are the foundational constructs that instigate or stimulate specific indicators, known as surface factors. The global factor denotes a source factor given it taps into underlying and general perceived competence, whereas the specific factors denote surface factors that are impacted by the global factor. Bifactor approaches are useful as they enable the simultaneous examination of both global and specific factors in relation to predictors and outcomes. This generates insights that can guide whether practical initiatives should be directed towards global factors, specific factors, or both. In the

current study, we further examine these global and specific factors of PSEC using this bifactor approach.

1.3 Autonomy support as a predictor of PSEC

Need support involves the practices of a person in an authority or leadership position that foster the basic psychological needs of autonomy, competence, and relatedness among individuals within that context (Ryan & Deci, 2017). There are three types of need support, each corresponding to a different need. Notably though, autonomy support is relevant to all three basic psychological needs (Deci et al., 2001) and is deemed foundational given it necessarily grounds the two other types of need support to ensure they are most beneficial (Reeve & Cheon, 2021). *Autonomy-supportive practices* are founded upon perspective taking, and involve using a supportive interpersonal tone, providing rationales for task assignment, providing choice where possible, and displaying patience among other elements (Reeve et al., 2022; Ryan & Deci, 2017).

Prior studies (including experimental and longitudinal designs) have demonstrated that autonomy-supportive teaching can promote perceived competence. This has been shown in the academic domain (e.g., Cheon et al., 2018; Jang et al., 2010) and in physical education (Cheon et al., 2024a, 2024b). More directly related to the current research, Collie et al. (2024) demonstrated in a cross-sectional dataset that perceived autonomy-supportive teaching was linked with greater global PSEC among students. Research also demonstrates that perceived autonomy-supportive teaching is associated with other social-emotional factors, including lower bullying behavior (Roth et al., 2011) and greater well-being (King et al., 2024). Recently, Cheon et al. (2024a, 2024b) showed that students of physical education teachers trained to be more autonomy supportive developed more grit and mental toughness (both indicators of resilience) across the school year, as assessed using standard measures, relative to students in classes of control group teachers.

Within SDT, a growing literature also bespeaks the important role of parental autonomy support in the development of SEC. Studies have shown that autonomy-supportive parenting is correlated with greater prosocial behavior and well-being, and lower externalizing behavior among students (Cheon et al., 2024a, 2024b; Hwang & Jung, 2021; Teuber et al., 2022). A recent meta-analysis (Bradshaw et al., 2024) also revealed that across child age and across cultures, parental autonomy support facilitated, whereas parental psychological control harmed, child well-being.

Some research to date has specifically considered whether perceived autonomy-supportive parenting is linked with social-emotional competencies, including executive functioning and emotion regulation (Roth et al., 2019). For example, Laurin and Joussemet (2017) found that autonomy-supportive parents fostered more internalization and self-regulation over a year in two-year-olds compared to more controlling parents. Bindman et al. (2015) showed in longitudinal work that parental autonomy support contributed to greater executive functioning. Carlson (2023) reviewed empirical support for the idea, consistent with SDT, that "giving children a sense of choice in how to act, think, and feel is essential for healthy executive functioning

skill development" (p. 220). In short, there is building evidence that parental autonomy support fosters social-emotional processing and regulation of behavior.

Guided by both Collie's (2020) SEC School Model and the more general framework of SDT (Ryan & Deci, 2017), we therefore anticipated that perceived autonomy-supportive teaching and parenting would be linked with higher global PSEC. Autonomy-supportive teachers and parents promote students' internal endorsement of their actions, offer competence-related information pertinent to navigating social-emotional interactions, and assist students to feel they are valued members of their classrooms or families (Ryan & Deci, 2017; Ryan & Moller, 2017). They also take perspective, reflect emotions, and offer opportunities for choice and decision making, experiences that should help students to feel more competent in their social-emotional experiences and interactions (Collie et al., 2024). Given limited prior research, we also explored the extent to which perceived autonomy-supportive teaching and parenting would be uniquely linked with the dimensions of PSEC. Examining the unique predictive roles of these two sources of autonomy support is important for building knowledge relevant to intervention efforts. To the extent that both are predictive, then home and school efforts may be important.

1.4 Social-emotional skills emanating from PSEC

When individuals feel capable within a domain, motivation theories posit that this conduces to thoughts, emotions, and actions that help them develop further competency or skills within that domain (Ryan & Moller, 2017; White, 1959). Indeed, and as described above, this motivational role of perceived competence (and cognate constructs) is a core component of numerous motivation theories (Bandura, 2001; Eccles & Wigfield, 2020; Ryan & Deci, 2017).

In the current study, we examined PSEC in relation to five social-emotional skills that can be considered skill-based manifestations of the different dimensions of PSEC. The skills were selected after consulting inventories of social-emotional skills/behaviors (e.g., Guo et al., 2023; Soto et al., 2022). Each skill was chosen for its specific relevance to a different PSEC dimension (see below for more details) and based on its potential modifiability (Cipriano et al., 2023). Other skills in the inventories were excluded because they did not map closely onto the PSEC dimensions and/or because they were more dispositional in nature (e.g., optimism, impulse regulation; Soto et al., 2022) and thus less amenable to change.

The five social-emotional skills we selected were as follows. *Leadership skill* denotes the capacity to assert one's own viewpoints and speak up in group settings (Chernyshenko et al., 2019; Soto et al., 2022). *Cultural competence* reflects the capacity to understand and value diverse cultural backgrounds (Chernyshenko et al., 2019; Soto et al., 2022). *Teamwork skill* captures the ability to work collaboratively to attain shared goals (Soto et al., 2022). *Cognitive reappraisal* denotes the capacity to change one's thinking about an event in order to adjust one's emotional reaction (Gross & John, 2003). *Emotional reflection* refers to the capacity to recognize and reflect on one's emotions (Smith et al., 2019).

Leadership skill was selected as an outcome of perceived competence for assertiveness given that individuals who feel able to self-advocate and assert themselves are more likely to act with leadership and resolve (Chernyshenko et al., 2019; Soto et al., 2022). Cultural competence was selected as an outcome of perceived competence for tolerance given individuals who feel capable to be open-minded are more likely to exhibit that through cultural respect and openness (Chernyshenko et al., 2019; Soto et al., 2022). Teamwork skill was selected as an outcome of perceived competence for social regulation given individuals who feel able to adhere to contextual norms are more likely to engage effectively with others (Chernyshenko et al., 2019; Soto et al., 2022). Cognitive reappraisal skill was selected as an outcome of perceived competence for emotion regulation given those who feel more able to manage their emotions are likely to go forth and do that through skills like cognitive reappraisal (Chernyshenko et al., 2019; Collie et al., 2024). Finally, emotional reflection skill was selected as an outcome corresponding to perceived competence for emotional awareness given that individuals who feel able to recognize their emotions are more likely to exhibit such skill (Collie et al., 2024). Together, the five skills represent salient outcomes relevant to the PSEC dimensions (see Limitations for details about other relevant skills that might be considered in future research).

Prior research provides only limited support for links between PSEC and these social-emotional skills. Collie et al. (2024) found that global PSEC and the specific factor of perceived competence for emotion regulation were both uniquely and positive associated with parent-reported cognitive reappraisal skill. Other work has linked PSEC with different skills, including greater parent-reported self-reflection (a skill related to emotional reflection, but more broadly focus on self-understanding; Collie et al., 2024) and student-reported perspective-taking skill (Wentzel et al., 2007). Additional work has been conducted in relation to behaviors, showing that PSEC (or a cognate construct) is linked with higher levels of prosocial behavior and lower levels of conduct problems (Bigman et al., 2016; Caprara et al., 2008; Collie, 2022b; Parise et al., 2019). Emerging work is now being conducted with longitudinal designs (Wigelsworth et al., 2017), showing that PSEC is linked with subsequent behavioral outcomes beyond baseline controls in middle adolescents (along with reciprocal associations; see Limitations for more on this).

Clearly, more work is needed in relating PSEC to social-emotional skills. As noted earlier, this is important for improving understanding about the nomological network of PSEC—including the extent to which the PSEC dimensions are uniquely associated with different skills. It is also important for practice, as this knowledge will help guide where efforts should be targeted in relation to the skills (e.g., should efforts focus on global PSEC and/or particular specific factors?). We expected that global PSEC would be linked with all skills given it reflects a broad, encompassing self-belief. This hypothesis is based on our conceptual framing where PSEC is expected to boost positive outcomes because individuals who believe they can be effective in a domain go on to think, feel, and act in ways that conduce to that (Collie, 2020; Ryan & Moller, 2017; White, 1959). In addition, we hypothesized the specific factors of PSEC would be uniquely associated with their counterpart skill. We retained as an open empirical question the extent to which the two sources

of perceived autonomy support (teacher and parent) would be directly or indirectly linked with the social-emotional skills.

2 Study overview

The aim of the current study was to extend understanding of PSEC. We assessed both perceived teacher and parental autonomy support at the start of a school term and examined the extent to which the two sources of autonomy support are uniquely associated with global and specific factors of PSEC assessed at the end of the same term. In turn, we tested whether all those factors are linked with five parent-reported social-emotional skills (also assessed at the end of the same term). Indirect associations were also examined (see Supplementary Materials for details). Figure 1 displays the hypothesized model. Although not central to our hypothesizing, we also tested a subsidiary model in which the two types of autonomy support were entered as direct predictors of PSEC and the outcomes. We also controlled for several background factors in subsidiary analysis (for details and results, see Supplementary Materials).

3 Method

3.1 Sample and procedures

Our sample involved 373 Australian students (and their parents/guardians) in grades 7 (18%), 8 (29%), 9 (18%), 10 (21%), 11 (14%), and 12 (< 1%). Approximately half (51%) identified as female, 48% identified as male, and < 1% identified as transgender, non-binary, or other. Students' average age was 14 ($SD = 1$; range 13–16) years, and 93% spoke only English at home. Almost one-fifth (19%) of the student sample had received a diagnosis of ADHD according to parent reports, which is above national estimates (i.e., 7.4%; Lawrence et al., 2015). Students' socio-economic status (SES) had an average of 1011 ($SD = 68$), which is around the national average (viz., $M = 1000$, $SD = 100$, see Measures for details; ABS, 2018). Students in our sample attended schools that were co-educational (88%), single-sex girls' (7%), or single-sex boys' schools (5%). Student were from three schooling sectors: government (63%), Catholic (22%), and independent schools (15%). Female (77%), male (22%), and non-binary (1%) parents/carers filled out the parent's section of the questionnaire. Support for sample representativeness is evident through similarities with population parameters and descriptive statistics in other studies using similar scales (see Supplementary Materials for details). The sample size was determined based on prior research finding significant associations among similar variables with comparable sample sizes (e.g., Collie et al., 2024; Wentzel et al., 2007). We also applied statistical approaches to ensure adequate power (e.g., error-adjusted mean scores; see Data Analysis).

Data from this study are shared with another study (Collie & Martin, 2024); however, none of the substantive associations reported in the present study have been

examined before. Data collection occurred via online questionnaire between July and September in 2023. This corresponded with Term 3 in the Australian school year, where there are four terms that are generally 10 weeks long. Time 1 was collected in week 3 of the term and Time 2 was collected in week 8 of the term. Recruitment was conducted through Qualtrics and their market research partners. The study invitation was shared with potential parent respondents via email or app notification. Parents provided consent and confirmed they had a 13–16 year-old attending school. Parents answered items about their child. If they had multiple children in this age group, we asked them to choose their youngest child. Following the previous step, parents were asked to pass their mobile device to the same adolescent. Specifically, instructions explained the following to parents: "Now please pass your computer or device over to your adolescent child aged 13–16 years so they can fill out the student part of the questionnaire. This should be the same child for which you answered the questions above. Please note: It is very important that you allow your child to answer the questionnaire without any help so we can gain a good idea of their perspectives." The adolescent then provided consent to participate and responded to student-focused items. Participants who completed the survey rapidly (< 1/3 of the median time), consistently answered in an identical manner for 80% of the survey or responded to contrasting item pairs in a similar way[1] were exited from the survey (Dewitt et al., 2019). The resulting response rate was 83%. The Time 1 sample was invited to participate again, resulting in a sample of 221 at Time 2 and an attrition rate of 41% between the two waves. Using *t*-tests, Time 1 substantive factors were contrasted by attrition status, and we saw only small effect sizes in terms of differences. Two background characteristics (students' grade and language background) were correlated with missingness at Time 2. When these covariates were added to our final model (described below), all significant paths remained (Enders, 2022). For completeness, we reran our final model with the matched T1 and T2 sample and again all significant paths were evident as described below. Ethics approval was received from the first authors' Institutional Review Board.

3.2 Measures

Validity evidence for the scale scores has been demonstrated in previous research (e.g., Collie, 2022b; Huebner et al., 2012; Soto et al., 2022), and this study yields further support via the analyses (including measurement invariance testing, see Supplementary Materials). For full lists of items, see citations below and/or Supplementary Materials. Reliability was assessed with McDonald's omega and was adequate for scores from all scales (see Table 1 for estimates and Data Analysis for details).

[1] Item pairs were from instruments collected in the larger research project. The items captured contrasting motives for enacting social-emotional behaviors (e.g., "…because I believe this is important to do" vs. "…actually I don't, because I don't see the point of putting more effort in"; Collie, 2022b). Participants who answered similarly to item pairs were exited from the survey (i.e., [strongly] agree or disagree for both items).

Table 1 Reliability estimates and descriptive statistics

	Omega (ω)	*M*	*SD*
T1 Predictors			
Autonomy-supportive teaching	0.84	4.61	1.18
Autonomy-supportive parenting	0.80	5.34	0.97
T2 PSEC			
Global PSEC (g)	0.96	–	–
Assertiveness (s)	0.70	5.00	1.07
Tolerance (s)	0.79	5.78	0.85
Social regulation (s)	0.62	5.40	0.86
Emotion regulation (s)	0.63	4.91	0.95
Emotional awareness (s)	0.60	5.17	0.99
T2 Outcomes			
Leadership skill	0.90	3.04	0.85
Cultural competence	0.89	3.80	0.75
Teamwork skill	0.89	3.59	0.73
Cognitive reappraisal skill	0.90	4.60	1.09
Emotional reflection skill	0.85	3.16	0.71

$\omega \geq 0.50$ is the cut-off for specific factors (see Method). PSEC = perceived social-emotional competence. (g) = global factor. (s) = specific factor. T1 = Time 1. T2 = Time 2

3.2.1 Perceived autonomy support

Students reported on autonomy-supportive teaching and parenting with four items each that were adapted from the Learning Climate Questionnaire (Williams & Deci, 1996) to focus on teacher and parent supports, and that reflect SDT's conceptualization of autonomy support (Aelterman et al., 2019; Duineveld et al., 2017): "I feel that my teachers/parents provide me with choices and options," "My teachers/parents encourage me to ask questions," "My teachers/parents listen to how I would like to do things," and "My teachers/parents try to understand how I see things before suggesting a new way to do things." Items were assessed on a 7-point scale from 1 (Strongly disagree) to 7 (Strongly agree).

3.2.2 Perceived social-emotional competence

The 20-item *Perceived Social-Emotional Competence Scale* (PSEC; Collie, 2022b), assesses five dimensions with 4 items each: perceived competence for assertiveness (e.g., "I feel capable to make sure my ideas are heard in group work at school"), tolerance (e.g., "I feel capable to be respectful of different cultures"), social regulation (e.g., "I feel capable at making sure I concentrate on my schoolwork without bothering others"), emotion regulation (e.g., "When I want to feel less bad [e.g., sad, angry], I am confident I can change how I'm thinking to feel better"), and emotional awareness (e.g., "I can use words to clearly explain how I'm feeling when I'm upset"). The emphasis on the school context for assertiveness and social regulation

helps to standardize students' responses—which is important for consistency given that students' social lives outside of school can vary significantly in opportunities for assertiveness and social regulation. On the other hand, evaluations of tolerance, emotional regulation, and emotional awareness are domain-general because students might not interact with individuals from a variety of backgrounds in school (e.g., their school might admit students from homogeneous backgrounds) and may not have opportunities to experience a wide range of emotion-eliciting events in the school environment. Items were rated on a 7-point scale from 1 (Strongly disagree) to 7 (Strongly agree).

3.2.3 Social-emotional skills

Social-emotional skills were reported by parents. Unless stated differently below, these were rated on a 5-point scale from 1 (Not at all well) to 5 (Extremely well). Three skills were assessed with items from Soto et al.'s (2022) Behavioral, Emotional, and Social Skills Inventory (BESSI). *Leadership skill* was assessed with four items tapping into the child's ability to act as a leader in their interactions (e.g., How well can your child: "Make decisions for a group of people"). *Cultural competence* was assessed with four items assessing the child's ability to show interest in and understanding for other cultures (e.g., How well can your child: "Learn about other cultures"). *Teamwork skill* was assessed with four items tapping into the child's ability to collaborate effectively as part of a group (e.g., How well can your child: "Work as part of a group"). See Supplementary Materials for all items used.

For *cognitive reappraisal skill*, we used an adapted versions of Gross and John's (2003) Emotion Regulation Questionnaire. Items were adapted to allow for parent reporting (five items; "I" was changed to "my child" and word/verbs were adjusted to match; see Supplementary Materials for all items). This scale was assessed on a 7-point scale ranging from 1 (Strongly disagree) to 7 (Strongly agree).

Four items from Collie (2023) were used to assess *emotional reflection skill*. These items tap directly into emotional reflection, and were amenable to parent ratings (e.g., How well can your child: "Recognize the emotions they experience;" see Supplementary Materials for all items).

3.3 Data analysis

M*plus* 8.11 (Muthén & Muthén, 2024) was employed for all analyses, which involved confirmatory factor analysis (CFA), exploratory structural equation modelling (ESEM), bifactor ESEM, and structural equation modelling (SEM). In all models, we used robust maximum likelihood (MLR) as the estimator. For missing data, we applied full information maximum likelihood ($<1\%$ missing within wave; see Sample and Procedures for between-wave missing data and approach). Model fit was assessed using the root-mean-square error of approximation (RMSEA), comparative fit index (CFI), and Tucker-Lewis index (TLI). Values of ≤ 0.08 for RMSEA and ≥ 0.95 for CFI/TLI reflect adequate fit (Hu & Bentler, 1999). M*plus* syntax for main models is presented at https://osf.io/pn624/.

3.3.1 Preliminary analyses

We first calculated means and standard deviations and then ran preliminary measurement models. In line with prior research (Collie, 2022b), we employed a bifactor ESEM approach to model PSEC (Supplementary Materials provide details of preliminary CFA and ESEM models). Bifactor ESEM allows cross-loadings to be freely estimated and for both global and specific factors to be specified. This approach is thus considered appropriate for PSEC because social-emotional factors are not mutually exclusive (Guo et al., 2023) and given prior evidence of a global factor among adolescents (Collie, 2022b).

Reliability coefficients (McDonald's ω) were calculated from the bifactor ESEM solution. Lower reliability coefficients for specific factors are expected given that true score variance is shared between global and specific factors (Morin et al., 2020). In line with Morin et al. (2020), we disregarded cross-loadings when calculating reliability with bifactor ESEM, interpreting $\omega \geq 0.50$ for specific factors (and $\omega \geq 0.70$ for the global factor) as adequate.

Preliminary CFAs were run for the predictors and outcomes. Omega coefficients for these factors were determined from the preliminary CFAs. We then ran measurement invariance tests to ascertain whether the psychometric properties of the scores from all scales were similar when compared across three key sample subgroups (by gender, age, and socio-economic status). These tests demonstrated invariance (see Supplementary Materials).

3.3.2 Main analyses

Our measurement model was run with bifactor ESEM for PSEC, along with error-adjusted mean scores for the predictors and outcomes. Error-adjusted mean scores were specified as follows: the loading of the scale mean was constrained to 1 and the residual was constrained with the following equation: $\sigma^2 * (1-\omega)$, where σ^2 represents the variance and ω represents the reliability of the factor (Brown, 2006). Error-adjusted mean scores provide some control for unreliability and were used because the complexity of the bifactor ESEM prohibited integration of latent hypothesized predictors/outcomes into the SEM (the number of free parameters was very large). The measurement model provided correlations among all factors.

Next, we ran SEM with the same specifications as the measurement model and with the structural paths shown in our hypothesized model (see Fig. 1): perceived autonomy-supportive teaching and parenting were entered as predictors of the global and specific factors of PSEC and, in turn, all factors were examined as predictors of the social-emotional skills. Shared variance was controlled by freely correlating the two types of autonomy support, and also the five social-emotional skills (the PSEC factors were orthogonal due to the use of bifactor ESEM). Finally, in subsidiary analysis, we further explored the relative contributions of perceived teacher and parental autonomy support to PSEC and the parent-rated skills. We conducted these analyses for completeness because PSEC and the skills were assessed at the same time point (for more on this, see Limitations). To examine this, we ran a subsidiary

SEM with the same model specification as our main model, but with PSEC and the parent-reported skills positioned alongside one another.

4 Results

4.1 Preliminary analyses

Table 1 displays means and standard deviations. The bifactor ESEM with a global factor and five specific factors yielded adequate fit: χ^2 (86) = 104.19, p = 0.09, RMSEA = 0.031, CFI = 0.99, TLI = 0.98. One negative residual variance was constrained to zero in this model. The bifactor ESEM demonstrated a well-defined global factor (|λ| = 0.48-0.74; M = 0.63), and relatively well-defined specific factors (|λ| = 0.11–0.86; M = 0.43). Lower loadings are expected in bifactor ESEM given items are being loaded onto multiple factors (Morin et al., 2020). Loadings represent the unique variance attributable to each specific factor excluding any variance attributable to the global factor. Supplementary Materials provides full details of the bifactor ESEM solution and the preliminary models tested.

Reliability was adequate for the global PSEC factor (ω = 0.96). As noted in Data Analysis, $\omega \geq 0.50$ is the cut-off for specific factors in bifactor modelling given that true score variance is shared between two factors (Morin et al., 2020). Reliability was therefore considered adequate for all specific factors (ωs = 0.60 to 0.79; see Table 1).

The preliminary CFA involving the two predictors yielded adequate fit (χ^2 [19] = 28.75, p = 0.07, RMSEA = 0.037, CFI = 0.98, TLI = 0.98), as did the preliminary CFA involving the outcomes (χ^2 [179] = 222.01, p = 0.02, RMSEA = 0.033, CFI = 0.98, TLI = 0.98). Reliability was also adequate for the predictors and outcomes (see Table 1).

4.2 Main analyses

4.2.1 Measurement model

Turning now to the primary measurement model, results indicated adequate fit: χ^2 (183) = 249.15, p < 0.001, RMSEA = 0.031, CFI = 0.98, TLI = 0.96. Correlations are displayed in Table 2 and were broadly as expected.[2] The two types of autonomy support were positively intercorrelated, and both were positively associated with global PSEC and all outcomes. Alongside this, perceived autonomy-supportive teaching was positively associated with the specific factors of perceived competence for assertiveness and social regulation. Perceived autonomy-supportive parenting was not associated with any specific factors of PSEC. Global PSEC was positively

[2] For completeness, we also conducted comparison models involving CFA instead of bifactor ESEM for the specification of PSEC. See Supplementary Materials for correlations from these comparison CFAs, which provide additional support for our modeling.

Table 2 Correlations from measurement model

	1	2	3	4	5	6	7	8	9	10	11	12
T1 Predictors												
1. Autonomy-supportive teaching												
2. Autonomy-supportive parenting	0.46											
T2 PSEC												
3. Global	0.31	0.47										
4. Assertiveness	0.25	0.05	–									
5. Tolerance	0.10	0.13	–	–								
6. Social regulation	0.31	0.13	–	–	–							
7. Emotion regulation	0.14	−0.07	–	–	–	–						
8. Emotional awareness	0.08	0.12	–	–	–	–	–					
T2 Outcomes												
9. Leadership skill	0.22	0.35	0.59	**0.37**	−0.05	−0.26	−0.06	−0.15				
10. Cultural competence	0.22	0.41	0.50	0.04	**0.51**	−0.11	−0.10	−0.08	0.45			
11. Teamwork skill	0.36	0.52	0.72	0.12	0.13	**0.05**	−0.15	−0.15	0.73	0.71		
12. Cognitive reappraisal skill	0.32	0.39	0.63	0.09	0.01	0.07	**0.30**	0.05	0.49	0.38	0.51	
13. Emotional reflection skill	0.25	0.42	0.65	−0.01	−0.03	−0.08	0.10	**0.22**	0.67	0.60	0.65	0.68

Correlations are from the main measurement model involving bifactor ESEM for PSEC. The global/specific factors of PSEC do not have intercorrelations (they are orthogonal given the use of bifactor ESEM). Bolded correlations reveal the PSEC dimension and its counterpart skill. $| r | \geq 0.20$ are significant at $p < 0.05$. PSEC = perceived social-emotional competence. T1 = Time 1. T2 = Time 2

associated with all outcomes, which were also all positively intercorrelated. Of the PSEC specific factors, each was positively associated with its hypothesized skill counterpart, with one exception: perceived competence for social regulation was not associated with teamwork skill. In addition, perceived competence for social regulation was negatively associated with leadership skill.

4.2.2 Structural model

The SEM yielded adequate fit: χ^2 (183) = 249.17, $p < 0.001$, RMSEA = 0.031, CFI = 0.98, TLI = 0.96. Figure 2 shows significant results and Table 3 presents all standardized beta estimates. Perceived autonomy-supportive parenting was positively associated with global PSEC, but none of the specific-factors. Perceived autonomy-supportive teaching was not associated with global PSEC but was positively associated with the specific factors of assertiveness and social regulation. Global PSEC was positively associated with all social-emotional skills. Turning to the specific factors, perceived competence for assertiveness was positively associated with leadership skill. Perceived competence for tolerance was positively associated with cultural competence. Perceived competence for social regulation was negatively associated with leadership skill. Perceived competence for emotion regulation was positively associated with cognitive reappraisal skill. Perceived competence for emotional awareness was positively associated with emotional reflection skill. A test of the model with covariates revealed very similar findings (see Supplementary Materials for details).

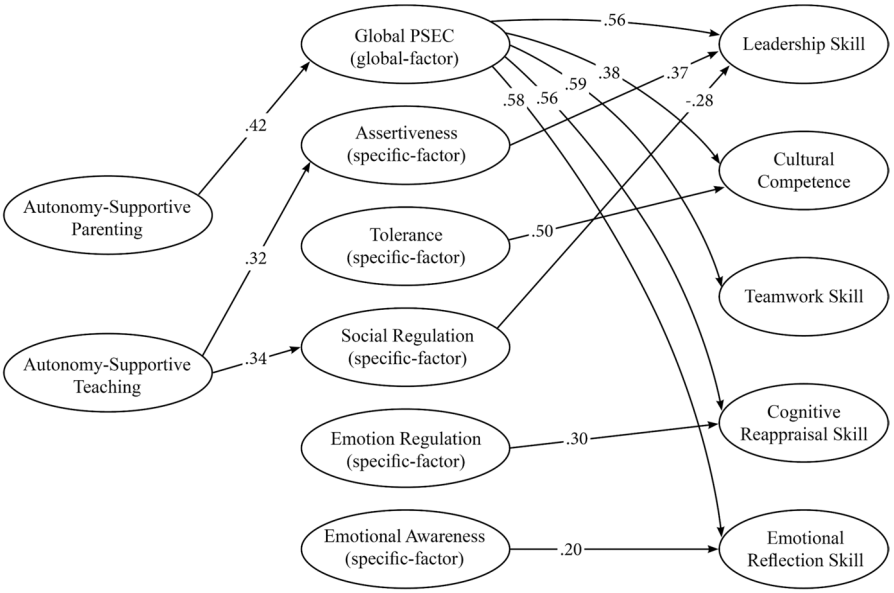

Fig. 2 Structural equation modelling results. *Note* Standardized betas. Only significant paths shown. For all paths (including non-significant paths and those involving covariates), see Table 3

Table 3 Standardized beta loadings from structural equation model

	T2 PSEC						T2 Outcomes				
	Global	Assert	Toler	Social reg	Emo. reg	Emo. aware	Leadership skill	Cultural competence	Teamwork skill	Cognitive reappraisal skill	Emotional reflection skill
T1 Predictors											
Aut.-supp. teaching	0.10	0.32**	0.07	0.34**	0.24	0.06	0.03	0.03	0.09	0.01	0.02
Aut.-supp. parenting	0.42***	−0.04	0.16	0.05	−0.17	0.14	0.14	0.16	0.18	0.13	0.15
T2 PSEC											
Global (g)							0.56***	0.38***	0.59***	0.56***	0.58***
Assertiveness (s)							0.37*	0.03	0.10	0.07	−0.01
Tolerance (s)							−0.07	0.50***	0.11	−0.02	−0.05
Social regulation (s)							−0.28**	−0.13	0.03	0.04	−0.10
Emotion regulation (s)							−0.06	−0.09	−0.15	0.30**	0.10
Emotional awareness (s)							−0.18	−0.10	−0.18	0.03	0.20*
R-squared	22%	9%	4%	13%	5%	3%	59%	56%	63%	51%	50%

Aut.-supp. = autonomy-supportive. Assert. = assertiveness. Toler. = tolerance. Reg. = regulation. Emo. aware. = emotional awareness. PSEC = perceived social-emotional competence. (g) = global factor. (s) = specific factor

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

4.3 Subsidiary analysis

In a subsidiary analysis, we wanted to further explore the relative contributions of perceived teacher and parental autonomy support to PSEC and parent-rated skills. To do so, we regressed these variables onto both teacher and parental autonomy support directly using SEM. Results indicated adequate fit: χ^2 (183) = 249.15, $p < 0.001$, RMSEA = 0.031, CFI = 0.98, TLI = 0.96—indeed, the fit was identical to our main SEM given the same number of parameters. Standardized beta estimates are presented in Table 4. Like in our central model, parental autonomy support was again the preeminent predictor of PSEC (as expected given these associations were unchanged). Alongside that, parental autonomy support was a significant predictor of all parent-rated skills. Teacher autonomy support was not uniquely associated with any skills. This subsidiary analysis provides further knowledge of the role of autonomy support in relation to social-emotional skills.

5 Discussion

We investigated the extent to which students' perceptions of autonomy support from teachers and parents assessed at the start of a school term are associated with PSEC assessed at the end of the same term and five parent-reported social-emotional skills (also assessed at the term's end). Of particular interest were the relations between the global and specific factors of PSEC and their parent-rated counterpart skills

Table 4 Standardized betas from subsidiary SEM involving autonomy support factors predicting all other substantive factors directly

	T1 Predictors	
	Autonomy-supportive teaching	Autonomy-supportive parenting
T2 PSEC		
Global (g)	0.10	0.42*
Assertiveness (s)	0.32*	−0.04
Tolerance (s)	0.07	0.16
Social regulation (s)	0.34*	0.05
Emotion regulation (s)	0.24	−0.17
Emotional awareness (s)	0.06	0.14
T2 Outcomes		
Leadership skill	0.08	0.31*
Cultural competence	0.04	0.40*
Teamwork skill	0.15	0.45*
Cognitive reappraisal skill	0.17	0.31*
Emotional reflection skill	0.07	0.39*

PSEC = perceived social-emotional competence. (g) = global factor. (s) = specific factor. T1 = Time 1. T2 = Time 2

*$p < 0.05$

(e.g., perceived competence for assertiveness and greater leadership skill). Additionally, based on SDT we were interested in the unique and relative contributions of teacher and parental autonomy support to PSEC and to parent-rated skills.

5.1 Findings regarding PSEC

Replicating Collie's (2022b) previous findings, PSEC was well-modeled by the bifactor approach, breaking into a global factor and five specific factors, reflecting the specific perceived competencies. As noted earlier, the global factor is interpreted as a person's perceived competence towards social-emotional phenomena in general (Collie, 2022b). This global factor undergirds and instigates the specific factors (Cattell, 1946), which represent a person's perceived competence towards more specific social-emotional phenomena (Collie, 2022b). Global PSEC was associated with all parent-reported social-emotional skills, showing its broad importance and extending prior research that has linked PSEC with one or two social-emotional skills (Bigman et al., 2016; Caprara et al., 2008; Collie et al., 2024; Parise et al., 2019; Wentzel et al., 2007). These findings likely occurred because students who feel competent in a domain are more likely to engage in thoughts, emotions and actions that demonstrate and further develop skill within that domain (Collie & Martin, 2024; Ryan & Moller, 2017; White, 1959).

We also saw that most of the specific factors of PSEC were positively linked with their hypothesized counterpart skill. Thus, perceived competence for assertiveness was related to parent-rated leadership skills; perceived competence for tolerance with parent-rated cultural competence; perceived competence for emotion regulation with parent-rated cognitive reappraisal skills; and finally, perceived competence for emotional awareness was associated with parent-rated reflective skills. These results align with our conceptual framing, which establishes that PSEC is associated with greater levels of adaptive outcomes (Collie, 2020; Ryan & Deci, 2017). Moreover, the findings provide further nuance by highlighting the role of specific PSEC dimensions for distinct skills. This corroborates emerging research revealing that the specific PSEC factors do play distinct roles, but as noted above, prior work has only examined one or two skills and has mostly focused on well-being and behaviors (e.g., Collie et al., 2024). Our study is the first to test a counterpart skill for each PSEC dimension, and our findings help to inform future research and practice around where efforts should be focused in order to support particular skills (e.g., perceived competence for tolerance appears key for supporting cultural competence). At the same time, the exception to this matching pattern involved the specific factor of perceived competence for social regulation, which was not linked with teamwork skill (its hypothesized outcome) and was also negatively related to parent-reported leadership skills.

We first discuss the non-significant link between perceived competence for social regulation and its counterpart skill. Our bifactor ESEM specification distinguished variance due to a shared global factor from specific variance associated with each dimension. This can be informative, but the contrary results involving perceived competence for social regulation require further examination. It is possible that the

teamwork items tap into a more specific skillset than social regulation assesses, but one associated with global PSEC. It may also be that once that commonality of PSEC is extracted, the remaining variance attributable to perceived competence for social regulation is not relevant for this skill. Thus, future efforts might consider other potential skills that could be associated with perceived competence for social regulation, such as perspective-taking or self-regulation skills. Additionally, results suggest that the items assessing this dimension may need to be revisited in terms of the specific variance they yield.

Turning to the negative association between perceived competence for social regulation and leadership skill, this finding may be due to the characteristics of social regulation: waiting one's turn, matching behavior to social norms, and thinking of consequences before acting (CASEL, 2020; Collie, 2022b; OECD, 2021). These characteristics require high levels of perspective taking and regulation of one's thoughts, actions, and behaviors—and are quite different from the characteristics of leadership (e.g., asserting oneself, taking charge, convincing people to follow). Empirical research supports this, showing that students with higher self-control and responsibility tend to report lower assertiveness (Guo et al., 2023). Importantly, this negative association only occurred with the specific factor. Perceived competence for social regulation also contributed to the global factor, which was positively associated with leadership skill. In that sense, general, underlying PSEC appears important for leadership skill, but the unique, remaining part of social regulation appears to be inversely associated. Perhaps students high in perceived competence for social regulation may exhibit other skills such as the ability to follow directions effectively. Testing the link between perceived competence for social regulation and other skills is an important area for future research (see Limitations for more on this).

The overall strong relations of PSEC with most parent-rated social-emotional skills provide an important anchor for the nomological network of the construct, building on prior work examining a handful of skills (e.g., Collie et al., 2024; Wentzel et al., 2007). Findings suggest that, as in other domains (e.g., Cheon et al., 2018; Jang et al., 2010), perceived competence matters. Specifically, having confidence in one's ability to manage social-emotional events and experiences is associated with external ratings of associated skills.

5.2 Findings regarding autonomy support and PSEC

Results showed that autonomy-supportive parenting was associated with greater global PSEC, whereas autonomy-supportive teaching was associated with greater levels of two specific factors: perceived competence for assertiveness and social regulation. These findings align with our conceptual frameworks. Namely, the SEC School Model (Collie, 2020) stipulates the important role of contextual supports for promoting PSEC, and SDT more broadly emphasizes the importance of autonomy-supportive teaching and parenting for basic psychological need satisfaction, including perceived competence (Howard et al., 2024; Ryan & Deci, 2017). Autonomy-supportive teachers and parents take students' perspective, reflect emotions, and offer opportunities for choice and decision making, experiences that can

help students to feel more competent in their social-emotional experiences and interactions (Collie et al., 2024; Reeve et al., 2022). Notably, our findings extend prior work that has only examined perceived autonomy-supportive teaching (Collie et al., 2024) to show that perceived autonomy-supportive parenting appears to have a broader role for PSEC. It is possible that perceived autonomy-supportive teaching was more salient for the two specific factors because these dimensions were more relevant to the schooling context (see Methods). It is therefore understandable that teachers' autonomy support is more salient for school-related perceived competencies. Qualitative research will be helpful for further exploring these associations.

In a subsidiary analysis, we allowed autonomy-supportive teaching and parenting to compete in directly predicting PSEC and the parent-rated skills. Here, we found that parental autonomy support was also significantly associated with each of the parent-rated skills. These findings converge with a growing body of evidence in developmental psychology concerning the importance of parental autonomy support for social-emotional development more generally (Bradshaw et al., 2024). As noted above, perceived autonomy-supportive teaching was positively linked with two specific factors, assertiveness and social regulation, tapping directly into school-related experiences. Thus, although parental autonomy support appears most significant in perceiving oneself as competent in this domain, teachers may facilitate specific expressions of this.

5.3 Implication for practice

This study adds to the evidence that perceived competence matters for the display of social-emotional skills. With the caveat that longitudinal and experimental research is needed to support our findings, one implication is that school programs, and especially those focusing on social-emotional learning (SEL), might consider targeting PSEC (and cognate capability self-beliefs) within this domain (e.g., Metz et al., 2013). Second, these results also underscore the importance of parental autonomy support in building such confidence. SEL programs could, accordingly, focus on providing resources and skill building for parents, such as training in autonomy support (e.g., Mageau et al., 2022).

Efforts to directly address PSEC may also be helpful. Targeting global PSEC may be achieved by SEL programs, along with specific practices for each dimension. To support assertiveness and social/emotional regulation, teachers can prompt students to think back on a recent social-emotional experience and come up with alternative strategies for handling similar situations more effectively in the future (Boekarts & Pekrun, 2016). To enhance students' tolerance, teachers can show genuine interest in diverse student opinions during group discussions, explain the significance and benefits of diversity (e.g., new perspectives, experiences), and model respect for individuals with different backgrounds and viewpoints (Fu et al., 2022). For social/emotional regulation and emotional awareness, educators can integrate conversations about social-emotional skills into classroom discussions, such as what effective group work interactions look like, and offer students the chance to put these skills into practice through activities or roleplays (McLeod et al., 2017).

5.4 Limitations and future directions

Several limitations are necessary to consider in relation to our findings. First, our study was conducted within one school term. This is a salient timespan for schools; however, research that tests the extent to which PSEC is linked with outcomes over longer timeframes is important. Relatedly, longitudinal and experimental research are also needed for addressing questions of causal ordering and potential reciprocal effects. Indeed, it may be that when students put social-emotional skills into practice this boosts their PSEC and, in turn, subsequent skills. In our hypothesized model, we positioned PSEC before the skills based on our conceptual framing (Collie, 2020; Ryan & Deci, 2017). Nonetheless, reciprocal associations are possible. Studies over longer timeframes and with more waves of data will be able to test for reciprocity and whether there are different points in adolescence where one or the other take causal prominence (e.g., Wigelsworth et al., 2017).

Second, the social-emotional skills were parent reported. This is a strength of our study given that it reduces concerns about common-source bias. However, it will be important to triangulate our findings with other reports (e.g., from teachers and peers). Relatedly, we focused on five skills that were conceptually aligned with the PSEC dimensions and amenable to change. However, there are other skills potentially relevant to the PSEC dimensions and going forward it will be important to consider a wider range of skills (e.g., conversational skills, parent-reported assertiveness). In the present study, this was not possible as it would have overburdened respondents, but our results do pave the way for future studies looking at different skills. Notably, other research on social-emotional skills provides some evidence of broader domains of skills (e.g., Guo et al., 2023; Soto et al., 2022). In the present study, we wanted to provide nuanced understanding about links to specific skills; however in future research broader skillsets will be also important to examine.

Third, the method of data collection might have influenced the results, as both the parent and student from the same household completed the survey. Future work might consider collecting data within school settings. School-based data collection will also allow for efforts to account for the hierarchical clustering of students within classrooms/schools. Clustering was not possible in our study given students were recruited from across Australia. It is noteworthy that our sample and descriptive statistics resemble other research using different methods of data collection (see Supplementary Materials), supporting our data's representativeness. Fourth, although the sample size was determined based on prior research and we applied statistical techniques appropriate for more modest sample sizes, research with larger sample sizes is needed going forward to test if findings are replicated with additional statistical power. Finally, we focused on five conceptually-supported dimensions of PSEC. However, there are likely to be other dimensions relevant across different cultures and contexts, and these are important to consider in ongoing work on PSEC.

6 Conclusion

The salience of PSEC was generally supported, as results verified the importance of perceived competence within the social-emotional domain to the observable exercise of skills. Measurement modeling suggests some work may be needed on the social regulation subscale of the PSEC, and the meaning of its specific variance. However generally global and specific factors of PSEC predicted outcomes as expected. Moreover, both parental and teacher autonomy support were linked with PSEC. Such findings highlight yet another important benefit of parental and teacher autonomy support for students—this support is linked with a student's confidence and skill in handling the ongoing stream of social-emotional events that occur in their daily life.

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Declarations

Conflict of interests The authors report there are no competing interests to declare.

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Rebecca J. Collie , Ph.D., is a Scientia Associate Professor of Educational Psychology in the School of Education at the University of New South Wales, Australia. Rebecca conducts research in the broad areas of wellbeing, motivation, and academic and social-emotional development using quantitative research methods.

Richard M. Ryan Ph.D., is Professor at the Institute for Positive Psychology and Education, Australian Catholic University, Sydney, Australia, and Distinguished Professor in the College of Education at Ewha Womans University, Republic of Korea. A cofounder of self-determination theory he is interested in all aspects of human motivation.