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Peer Climate, Academic Motivation, and Psychological Well-Being Among Students in Higher Education

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Abstract

Peers are increasingly recognized as key socializing agents in university students' functioning. Yet, little is known about how peer climate relates to students' well-being. Grounded in self-determination theory, this study addressed the gap and explored the relationships between peer climate, students' self-determination, and their psychological well-being (life satisfaction and flourishing). A sample of 119 undergraduate students in the United Kingdom (M_{age} = 20.29, *SD* = 1.71) completed an online survey. The results revealed that perceived peer autonomy support was positively associated with both autonomous and controlled motivation and negatively associated with amotivation. Only the indirect path via amotivation significantly mediated the effect on psychological well-being (flourishing). These findings suggest that peer climate may contribute to student well-being not only directly, but also indirectly by reducing amotivation, further emphasizing the significance of peer influence and academic motivation. These findings also highlight the importance of fostering autonomy-supportive peer environments in higher education, suggesting that teaching and learning practices should intentionally cultivate positive peer interactions to reduce amotivation and enhance students' psychological well-being.

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Practitioner Notes

1. Educators should foster autonomy-supportive peer environments, as positive peer climates are associated with greater student life satisfaction and flourishing.
2. Collaborative learning activities should encourage student choice, mutual respect, and perspective-taking to support positive peer interactions.
3. Practitioners should address academic amotivation, as lower amotivation helps explain the relationship between supportive peer climates and flourishing.
4. Peer mentoring and group assessments should promote non-controlling communication, collaboration, and social connectedness to support student well-being.
5. Educators should minimise peer-driven performance pressure, recognising that autonomy-supportive environments may coexist with controlled academic motivation.

Keywords

peer climate, peer autonomy support, self-determination, higher education, well-being.

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Introduction

Psychological Well-being Among University Students

The psychological well-being (PWB) of university students, and the complex factors that shape or are shaped by their capacity to thrive academically, has become a central focus of concern for both researchers and educational practitioners (Carver et al., 2021; Suldo et al., 2011). Studying at University often presents major developmental milestones, requiring adaptation to new academic, social, and personal challenges (Chaudhry et al., 2024; Holliman et al., 2022). While this period can foster independence and flourishing, it can also generate stress, anxiety, and uncertainty (Chaudhry et al., 2024). Despite a significant focus on the importance of psychological well-being in university students, research indicates that students frequently experience chronic stress (Liu et al., 2023), often at higher levels than their non-student peers (Bewick et al., 2010). Therefore, it is important to address factors that influence students' motivation and well-being, such as the peer-based climate they experience in Higher Education (HE), especially given the sustained academic, social, and emotional demands throughout students' degree experiences (Tinto, 2012).

Theoretical frameworks have long conceptualised psychological well-being as a multidimensional construct encompassing both affective and functional components while emphasising the importance of positive functioning alongside the absence of distress (Diener, 1984; Ryan & Deci, 2000). In line with this perspective, the present study adopts a framework distinguishing 'well-being' into hedonic and eudaimonic factors as markers of university students' psychological well-being by measuring on scales for life satisfaction levels (mostly hedonic) and flourishing (mostly eudaimonic) (Ryan & Deci, 2001). The hedonic approach conceptualizes wellbeing in terms of subjective happiness—the experience of pleasure attainment—and contentment with life (Diener, 1985; Ryan & Deci, 2001). Hedonic enjoyment can be accompanied by the satisfaction of physically, socially and intellectually-based needs, though no conceptual restrictions apply to how hedonism is experienced (Waterman, 1993; 2007). In contrast, the eudaimonic perspective locates "true happiness" in self-realization. It holds that well-being follows from aligning one's actions with one's true self and from developing valued human potentials, such as building skills and talents or advancing a sense of purpose in life (Ryff, 1989; Waterman, 1993). Although often treated as conceptually distinct, hedonic and eudaimonic well-being tend to be strongly and positively correlated in empirical work (see Thorsteinsen & Vittersø, 2020). Some researchers have even questioned whether the two can be separated at the latent level (Disabato et al., 2016; Huta & Waterman, 2014). At the same time, they capture different aspects of positive functioning. In HE settings, students typically experience increased positive affect and satisfaction (indices of hedonism) when they find purpose, and are deeply engaged in active learning, pursue meaningful tasks and feedback, and work towards developing their academic potential; all hallmarks of eudaimonic well-being (Ryan et al., 2008). Thus, it is argued that eudaimonia can provide the necessary conditions for hedonic well-being. However, the conditions (e.g., student social events, or surface-level academic success) that can promote hedonic well-being would not necessarily lead to eudaimonic outcomes (e.g., personal growth; see Nix et al., 1999; Waterman, 1993).

Evidence suggests that higher levels of psychological well-being are consistently linked to improved academic outcomes, whereas lower well-being is associated with poorer performance and reduced attendance retention (Andrews & Wilding, 2004; Eisenberg et al., 2013). Notably,

students who report higher levels of eudaimonia tend to achieve higher academic outcomes, make greater progress towards academic goals, have more positive social relationships and lower levels of anxiety and depression (Barger et al., 2008; Devi et al., 2021; Kryza-Lacombe et al., 2018; Thorsteinsen & Vittersø, 2018). However, higher hedonia levels in the absence of eudaimonia do not reliably predict such outcomes (Kryza-Lacombe et al., 2018; Thorsteinsen & Vittersø, 2018). Collectively, these findings support previous work (e.g., Ryan et al., 2008) and highlight the importance of reviewing factors that influence students' well-being. Therefore, in the current study, we considered the conditions and motivational processes that foster eudaimonia, emphasising its role in creating a more complete and meaningful student experience. We adopt a eudaimonic perspective by focusing on the conditions (i.e., peer-created climate) by which eudaimonia is realized and the consequences through which it is experienced (e.g., flourishing). Aligned with past research and theory (e.g., Nix et al., 1999; Ryan & Deci, 2001), we also endorse the view that eudaimonic theories can be used to understand the antecedents of hedonic well-being, including life satisfaction.

Self-Determination Theory and Well-Being

One theoretical framework that adopts the eudaimonic perspective on well-being is Self-determination Theory (SDT) (Ryan & Deci, 2000; 2017). SDT (Deci & Ryan, 1985; Ryan & Deci, 2017) is a broad theoretical framework encompassing the study of human motivation, personality and well-being. Within SDT, motivation is assumed to fall along a continuum of self-determination (Ryan & Deci, 2000). At the lowest end of this continuum lies amotivation, which reflects a lack of intention, desire, or willingness to engage in a task. Progressing along the continuum is a more controlled form of motivation which encompasses external and introjected regulations (Adie et al., 2024; Ryan & Deci, 2002, 2017). External regulations are behaviours controlled by external inputs, which in the case of education could be for a grade expectation or to progress onto postgraduate degrees, whereas introjected regulation involves engaging in activities due to internal pressures such as guilt or the desire to feel worthy. Then lies more autonomous forms of regulation which reflect regulation driven by personal values, interests, and authentic goals (Ryan & Deci, 2017). Identified regulation occurs when individuals recognize and value the importance of the task. Integrated regulation represents the most autonomous expression of extrinsic motivation, in which behaviours are fully aligned with one's values and sense of identity. Finally, intrinsic motivation refers to engaging in an activity for the inherent enjoyment or satisfaction it provides (Deci & Ryan, 1985). In academic contexts, intrinsic motivation is often reflected through students' genuine interest, sustained engagement, and persistence within a subject area (Burton et al., 2006). Advancements in SDT research have now shifted to distinguishing academic motivation in terms of autonomous (i.e., intrinsic, integrated, identified), controlled (i.e., introjected and external) and amotivation (i.e., non-self-determined) (see Deci & Ryan, 2008). Consistent with SDT theory (Ryan & Deci, 2017), research in HE has shown that more self-determined forms of motivation (intrinsic, integrated, and identified) are associated with adaptive student outcomes and optimal functioning, whereas less or non–self-determined motivation (introjected and external regulation, amotivation) is linked to maladaptive outcomes and diminished functioning (e.g., Holliman et al., 2019; Vansteenkiste et al., 2005).

Another key premise of SDT is that individuals have three Basic Psychological Needs (BPN): autonomy, competence, and relatedness (Deci & Ryan, 1985). Autonomy involves self-direction and feeling in control and choice over one's actions, competence reflects feeling effective in one's

tasks, and relatedness denotes feeling connected and valued by others. These needs have been argued to be universal across domains of human functioning (Milyavskaya & Koestner, 2011). When these needs are satisfied, individuals will be regulated by more autonomous motivation (Reis et al., 2000), whereas when one or more of the psychological needs are frustrated, controlled motivation (and amotivation) will ensue.

In line with SDT satisfaction of the BPN is associated with enhanced psychological well-being (Sari, 2012). Education-based SDT research with university students similarly demonstrates that fulfilment of these needs predicts higher levels of well-being; for example, Reis et al. (2000) found that daily experiences of autonomy and competence were key contributors to students' well-being, as they fulfilled fundamental psychological needs and enabled individuals to experience greater self-direction, effectiveness, and satisfaction in their everyday lives. Extending this work, literature examining autonomous forms of academic motivation have shown that higher intrinsic motivation is associated with better psychosocial adjustment and greater well-being among university students (Bhat et al., 2016; Burton et al., 2006; Deci & Ryan, 2000; Qureshi et al., 2024). Conversely, extrinsic and amotivation have been linked to lower psychological well-being, higher stress levels and poor adjustment to university life (Baker, 2004; Vallone et al., 2023). In the context of higher education, levels of self-determined academic motivation will naturally vary among university students, depending on the extent to which their psychological needs are met (or not) within their learning environment (Ryan & Deci, 2000).

Peer-climate, Academic Motivation, and Well-being

Extending SDT research in HE, student well-being and basic need satisfaction are not automated (Ryan & Deci, 2000). According to SDT, the fulfilment of BPN and the development of autonomous motivation within higher education requires ongoing nourishment from relevant social agents in the environment (Deci & Ryan, 2000). Two key aspects of the environment that shape students' motivation and adjustment are the levels of autonomy support (and interpersonal controlling) behaviours provided by influential figures such as teachers, support staff, and friendships (Deci & Ryan, 1987; Ryan & Deci, 2017; Zhang et al., 2021). An autonomy supportive environment can be characterised by behaviours that encourage independent thinking, provide meaningful and stimulating discussions and allow for personal choice, and can increase autonomous motivation (Ryan & Deci, 2000). In contrast, a controlling environment exerts pressure on individuals to behave, feel, or think in a prescribed way, which can undermine intrinsic motivation and psychological well-being (Deci & Ryan, 1987; Reeve, 2009).

In line with this theory, previous literature has outlined that high levels of autonomy support and low levels of controlling interpersonal behaviours can be beneficial to students (Black & Deci, 2000; Deci & Ryan, 2002). For example, it has been documented that teachers' interpersonal style of autonomy support positively predicted the satisfaction of the basic psychological needs, negatively predicted the rates of depressive symptoms, and predicted higher well-being (Gillet et al., 2019; Pineda et al., 2025; Ryan & Deci, 2017). In practice, an autonomy-supportive teaching style involves acknowledging students' perspectives, offering meaningful choice, providing a rationale for tasks, and minimising controlling pressure such as evaluative or deadline-driven language (Reeve, 2009). These findings have been reflected in HE and school-based research to show that school social agents like teachers and teaching assistants can be positively associated with psychological well-being by providing support, encouragement, and a sense of

connection that helps students feel valued and capable (Zhang et al., 2021) and can help satisfy the need for relatedness with positive teacher–student relationships (Stroet et al., 2013). As well as the association between well-being, autonomy support from social agents has also been positively correlated to autonomous motivation in HE students (e.g., Feri et al., 2016; Girelli et al., 2018). Moreover, Neufeld and Malin (2020) found that higher rates of autonomy support by educators for medical students positively predicted both their autonomous motivation levels and psychological well-being. Supporting these findings, a study by Kotomina et al. (2024) found that parental autonomous supportive environments positively affected Russian first-year students' self-reported psychological well-being, with autonomous motivation mediating this relationship. Furthermore, more controlling behaviours, such as guilt or shaming, were negatively associated with psychological well-being (Soenens et al., 2012) as this was reported to trigger the introjected motivators (external) rather than the autonomous motivators. This was further supported by literature linking higher levels of perceived controlling teaching to be negatively associated with autonomous motivation and positively associated with negative feelings (Bartholomew et al., 2018).

Beyond adult figures such as parents and teachers, peer relationships have also been linked to students' motivation and well-being (Wu & Dong, 2024). A multi-analysis study by Ratelle et al. (2012) evaluated the impact of autonomy support from three different socialising agents, romantic partners, friends, and parents on the perceived subjective well-being of university students. The findings indicated that perceived autonomy support from each social agent was significantly associated with university students' psychological well-being, with a cumulative effect observed when autonomy support was provided by all three agents. Building on this, research into the perceived peer autonomy support for secondary school students with disabilities has outlined similar results. Audet et al. (2023) found that family members hold meaningful roles in fostering well-being for students with disabilities by helping to support their autonomy and academic goals, a common need satisfaction for students. This is further supported by empirical findings that when an environment encourages the students' autonomy, students report higher autonomous motivation (Orsini et al., 2018) and higher psychological well-being levels (Pineda et al., 2025).

Although substantial research has examined how teacher, parental and friendship autonomy support shapes students' motivation and well-being (e.g., Feri et al., 2016; Girelli et al., 2018; Soenens et al., 2012), far less is known about the role of student peer autonomy-supportive climates, particularly in higher education, where peer relationships become a major source of academic and emotional influence (Wentzel, 2017). As stated by Adie and colleagues (2024), peer socializing agents become increasingly more important in HE, developing and sustaining student well-being (Tikkanen et al., 2024; Wentzel, 2017) especially due to the noted increased push for incorporating interdisciplinary group work in HE due to the proposed benefits for academic outcomes and employability (Bertucci et al., 2010; Lavy, 2017; Pfaff & Huddelston, 2003).

Moreover, few studies assess how motivational processes are tested as mediational mechanisms linking peer climate to well-being, despite strong theoretical foundations from self-determination theory (Ryan & Deci, 2000). In one exception, Adie et al. (2024) examined relationships between peer climate, academic motivation, and student functioning (assessed via measures of work engagement and burnout) among 373 undergraduate psychology students. They found a peer-autonomy supportive climate to be positively associated with both autonomous and controlled

regulation (the former more strongly) and negatively associated with amotivation. Mediation analyses also revealed that autonomous motivation fully mediated the relationship between peer climate and engagement while autonomous motivation and amotivation partially mediated the indirect relationships between peer climate and burnout. However, it remains that research in this area, including that by Adie et al. (2024), tends to either treat well-being as a single construct and/or do not measure 'well-being' directly in a way that also accounts for differences between hedonic (life satisfaction) and eudaimonic (flourishing) components. There is also very limited research into the impact of academic motivation as a mediator between autonomy support on each facet within HE. The present study aims to address these gaps. The findings may have important practical implications for higher education teaching and learning regarding the value of designing collaborative activities that might foster autonomy-supportive peer interactions to enhance student motivation and well-being.

Summary, Rationale, and Research Questions

Overall, growing attention has been directed toward the psychological well-being of university students. Previous research has recognised the significant role of peer support and involvement in shaping students' psychological outcomes during this period (e.g., Zhang et al., 2025). More recently, research by Adie and colleagues (2024) have reported the significant impact of peer climate on students' academic motivation and psychological functioning (measured via engagement and burnout). However, few studies have directly investigated the relationship between the peer-created learning climate, motivation, and psychological well-being capturing hedonic (life satisfaction) and eudaimonic (flourishing) components. Therefore, we hypothesised that there would be a significant positive relationship between peer climate and psychological wellbeing outcomes (life satisfaction and flourishing respectively). Moreover, we hypothesised that academic motivation would mediate the peer climate-psychological wellbeing outcomes relationships.

Method

Design

This study employed a cross-sectional, correlational design. The criterion (outcome) variables consisted of students' self-reported flourishing and life satisfaction, as an indicator of psychological well-being. The predictor variable was participants perceived autonomy support from peers. Drawing from established self-determination theoretical frameworks, students' motivation types (autonomous regulation, controlled regulation, and amotivation) were investigated as parallel mediators. Data were collected through an English-language online questionnaire administered via Qualtrics.

Sample and Procedure

This study draws on the same sample as that reported in prior work on the role of parental motivational messages (Yin et al., Under Review). *A priori* power analysis using G*Power 3.1 determined that a minimum of 129 participants would be required to detect a medium effect size (f^2 = .15) with α = .05 and power = .95. A total of 164 undergraduate students enrolled in UK higher education institutions were recruited between December 2024 and April 2025 using a combination of convenience and self-selection sampling strategies (Etikan et al., 2016).

Recruitment channels included academic networks, social media platforms (e.g., Instagram and X), and a university research participation pool offering students two research credits. Participants accessed the survey via a QR code or web link shared through recruitment materials. Eligibility was limited to individuals aged 18 and above, and participation was voluntary and anonymous. No financial compensation was offered. Following informed consent, participants completed a 15-minute online survey including demographic items and validated scales measuring peer climate, academic motivation, life satisfaction, and flourishing. Respondents were free to withdraw at any point before submission. A debriefing message was presented upon survey completion. Ethical clearance for the study was granted by the Institutions, Research Ethics Committee.

Of the initial sample, 45 were excluded due to incomplete data, yielding a final analytic sample of 119 undergraduate students (M_{age} = 20.29, *SD* = 1.71, range = 18-33). The final sample was slightly below the a priori target sample size indicated by the power analysis (N = 129), which may have reduced sensitivity to detect small indirect effects. The sample comprised 16 males, 102 females, and one participant who chose not to disclose their gender. A majority identified as international students (73.1%), with the remainder being UK domestic students (26.9%). Most participants (85.7%) were enrolled in social science or education-related degree programmes.

Measures

Demographic Information

Demographic information addressed in this survey included age, gender, student status, university affiliation and field of study. These variables were only collected to contextualise participants' backgrounds.

Peer Climate

Peer climate was assessed using the adapted version of Learning Climate Questionnaire (LCQ; Williams & Deci, 1996), which assesses the extent to which students perceived their peers to provide autonomy support. Similar to Adie et al. (2024), in the current study, the full 15-item version was modified by changing the source of support from teachers to peers (e.g., "*My peers try to see how I see things before suggesting a new way to do things*"). The responses were rated on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*). This adapted version has demonstrated good psychometric properties in prior research with university students (e.g., Adie et al., 2024; Adie & Wakefield, 2011; Zhou et al., 2019), and internal consistency in the current sample was acceptable (α = .73).

Academic Motivation

Students' motivation for studying their course was assessed using the college version of the Academic Motivation Scale (AMS-C28; Vallerand et al., 1992). This 28-item instrument evaluates seven distinct motivational orientations. Three subscales capture intrinsic motivation: to know (e.g., "Because I experience pleasure and satisfaction while learning new things"; α = .86), toward accomplishment (e.g., "For the pleasure that I experience while I am surpassing myself in one of my personal accomplishments"; α = .87), and to experience stimulation (e.g., "For the intense feelings I experience when I am communicating my own ideas to others"; α = .85). Identified regulation represents the most autonomous form of extrinsic motivation (e.g., "Because I believe

that a few additional years of education will improve my competence as a worker"; α = .79), while introjected (e.g., "Because I want to show myself that I can succeed in my studies"; α = .84) and external regulation (e.g., "Because I want to have the good life later on"; α = .81) reflect more controlled types of extrinsic motivation. The scale also includes a measure of amotivation, reflecting a lack of intentionality or purpose in academic activity (e.g., "I don't know; I can't understand what I am doing in university"; α = .85). Items were rated on a 5-point Likert scale from 1 (does not correspond at all) to 5 (corresponds exactly). The AMS-C28 has shown good psychometric properties in previous research with higher education populations (e.g., Adie et al., 2024; Smith et al., 2010). In line with self-determination theory and prior educational research (e.g., Adie et al., 2024; Bartholomew et al., 2011), composite scores were calculated: intrinsic and identified regulations were combined to form an autonomous motivation (α = .93); introjected and external regulations were aggregated to represent controlled motivation (α = .85). Amotivation was analyzed as a distinct construct (α = .85).

Psychological Well-Being

To provide a comprehensive assessment of students' psychological well-being, both hedonic and eudaimonic dimensions were measured using established self-report scales.

Hedonic well-being was assessed using the Satisfaction with Life Scale (SWLS; Diener et al., 1985), which comprises five items measuring participants' overall cognitive evaluations of their lives (e.g., "I am satisfied with my life"). All items were rated on a 7-point Likert scale from 1 (Strongly Disagree) to 7 (Strongly Agree). Scores were averaged to create an overall estimate of life satisfaction, with higher scores indicating greater satisfaction. The internal consistency in the present study was good (α = .83).

Eudaimonic well-being was measured using the Flourishing Scale (FS; Diener et al., 2010), which comprises eight items capturing participants' perceived success in key areas of psychological functioning, such as purpose, relationships, and self-esteem (e.g., "I lead a purposeful and meaningful life"). All items were rated on a 7-point Likert scale from 1 (Strongly Disagree) to 7 (Strongly Agree). Items were averaged to create an overall estimate of flourishing, with higher values indicating greater perceived psychological functioning. The internal consistency in the present study was excellent (α = .91).

Data Analysis

All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS version 30.0) with a significance threshold of $p < .05$. Descriptive statistics, including measures of central tendency and dispersion, were computed for all study variables. Bivariate relationships among these variables were examined using Pearson correlation coefficients. Mediation analyses were subsequently performed using Hayes's (2013) the PROCESS macro (Model 4). Indirect effects were estimated using bias-corrected bootstrap confidence intervals based on 5,000 bootstrap samples. An indirect effect was considered statistically significant if the 95% confidence interval did not include zero (Preacher & Hayes, 2008). Notably, prior to these analyses, the assumptions of regression, including linearity, homoscedasticity, independence of errors, and normality of residuals, were met.

Results

Preliminary Analysis

Means, standard deviations, and bivariate correlations among all study variables are presented in Table 1.

Table 1

Descriptive statistics and Bivariate correlations among substantive variables.

Variable	*M*	SD	1	2	3	4	5
1. Peer climate	4.62	.71	–				
2. Autonomous regulation	3.37	.76	.32**	–			
3. Controlled regulation	3.67	.77	.24**	.56**	–		
4. Amotivation	1.85	.92	-.23*	-.33**	-.10	–	
5. Life satisfaction	4.62	1.17	.37**	.28**	.24**	-.20*	–
6. Flourishing	5.41	.98	.43**	.41**	.33**	-.38**	.70**

Note. *p <.05; **p <.01. Possible score range is 1–7 for all variables except motivation variables (1–5).

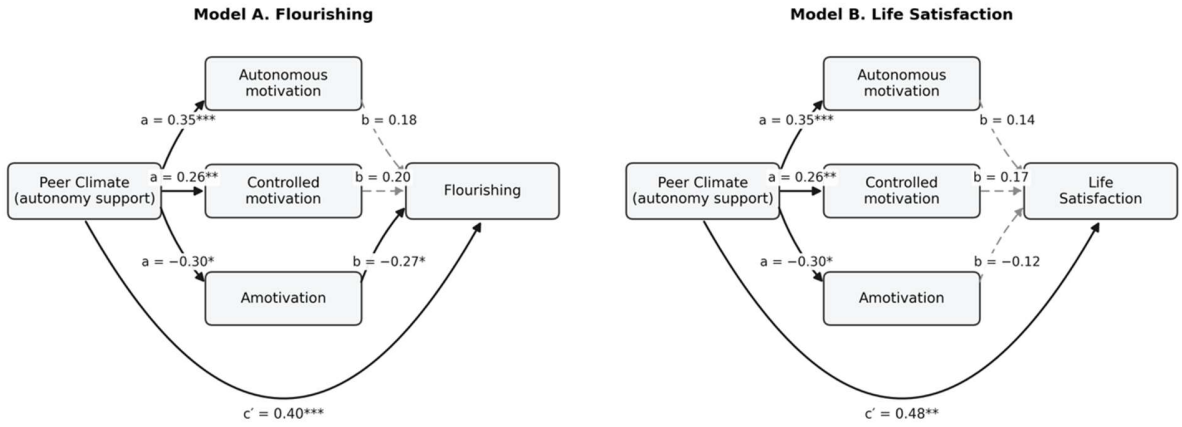
On average, students reported relatively high levels of perceived peer climate and well-being, as indicated by both flourishing and life satisfaction. Regarding academic motivation, controlled regulation was reported at a slightly higher level than autonomous regulation, whereas amotivation was relatively low across the sample. This suggests that participants were more likely to be motivated by external or internalised goals, rather than engaging in academic activities without purpose.

Mediation Analysis

Mediational analyses were conducted to examine the direct and indirect effects of peer climate on motivation and psychological outcomes (see Figure 1).

Figure 1

Parallel Mediation Models of Peer Climate Predicting Flourishing (Model A) and Life Satisfaction (Model B) Through Academic Motivation



Note. Solid arrows indicate significant paths (p < .05) and dashed arrows indicate non-significant paths. Coefficients are unstandardised. *p < .05, **p < .01, ***p < .001.

Flourishing

Peer climate was a significant predictor of greater flourishing (B = 0.40, SE = .11, p < .001). Among the three types of motivation, only amotivation significantly and negatively predicted flourishing (B = -0.27, SE = .09, p < .05); neither autonomous regulation (B = 0.18, SE = .13, p > .05) nor controlled regulation (B = 0.20, SE = .12, p > .05) were significant predictors. The total indirect effect of peer climate on flourishing was significant (B = 0.20, 95% CI [.08, .34]). Notably, the specific indirect effect via amotivation was also significant (B = 0.08, 95% CI [.01, .19]), indicating a meaningful mediation effect. Since the direct effect of peer climate on flourishing remained significant, the results support a partial mediation model.

Life satisfaction

Peer climate significantly and positively predicted life satisfaction (B = 0.48, SE = .15, p < .05). When motivation types were added to the model, none emerged as significant predictors of life satisfaction (Autonomous Regulation: B = 0.14, SE = .17, p > .05; Controlled Regulation: B = 0.17, SE = .16, p > .05; Amotivation: B = -0.12, SE = .12, p > .05). Interestingly, the total indirect effect of peer climate on life satisfaction through the three motivation types combined was significant (B = 0.13, 95% CI [.02, .28]), whereas none of the individual indirect paths via autonomous regulation, controlled regulation, or amotivation were statistically significant, as their confidence intervals included zero. This pattern suggests that the significant total indirect effect may reflect the cumulative influence of several small, non-significant effects rather than a clear mediating mechanism. Conceptually, the results are more consistent with a direct effect of peer autonomy support on life satisfaction, rather than an indirect effect through motivation.

Discussion

The present study set out to examine the influence of peer climate on university students' psychological well-being. Overall, the current findings suggest that perceiving an autonomy-supportive peer climate is significantly positively related with autonomous and controlled regulation and negatively associated with amotivation. It was also related with higher levels of life satisfaction and flourishing. Notably, while peer climate significantly predicted both forms of well-being, the mediating role of motivation varied across outcomes. For life satisfaction, the relationship appeared to be primarily direct, with no significant mediation by motivation types. In contrast, the effect of peer climate on flourishing was partially mediated by amotivation, suggesting that students who perceived greater peer support reported lower amotivation, which in turn was associated with higher flourishing. These findings will be elaborated in the following discussion.

Overview and Contribution of the Study

A core contribution of the present study was examining the indirect associations between peer climate and psychological well-being via autonomous, controlled motivation and amotivation within a HE context. Students generally perceived their climate as supportive and positive and reported high levels of flourishing and life satisfaction with low amotivation. Interestingly, controlled regulation was slightly higher than autonomous regulation, suggesting that while students feel supported by peers, their academic engagement may still be driven by external or internal pressure (e.g., outside expectations, guilt, grade worries). Overall, the current findings suggest that perceiving an autonomy-supportive peer climate is associated with higher levels of life satisfaction and flourishing. Notably, while peer climate significantly predicted both forms of well-being, the mediating role of motivation varied across outcomes. For life satisfaction, the relationship appeared to be primarily direct, with no significant mediation by motivation types. In contrast, the effect of peer climate on flourishing was partially mediated by amotivation, suggesting that students who perceived greater peer support reported lower amotivation, which in turn was associated with higher flourishing. This supports SDT-based work where the less students felt their actions had no meaning or purpose, their psychological well-being increased (Ryan & Deci, 2000)

Peer Climate and Wellbeing

The observed positive relationship between peer autonomy supportive climate and psychological well-being is broadly consistent with SDT-based educational research (e.g., Ratelle et al., 2012; Siedlecki et al., 2014; Wu & Dong, 2024). Although this body of work has predominantly emphasised the influence of other socialising agents, such as teachers, close friends and romantic partners, and has employed varied operationalisations of well-being, the role of student peers is not acknowledged. From an SDT perspective, the positive relationship between peer climate and both types of well-being can be understood through the mechanism of autonomy supportive environments, potentially satisfying the three BPN (Ryan & Deci, 2000). As peers constitute a central part of students' daily social experience, supportive climates may be especially influential in promoting these need-satisfying conditions. When peers respect each other's perspectives, encourage self-expression and avoid imposing expectations, students experience a stronger sense of autonomy where their actions and decisions are genuinely their

own. At the same time, the need for competence and relatedness is being met due to an environment being created where students feel able to explore and collaborate, making them feel more competent. Followed by relatedness being met as an environment where the student feels valued, understood, and respected, is being created by their peers. These supportive social bonds have been noted to buffer stress, enhance emotional resilience, and contribute to this deeper sense of life satisfaction (Wentzel, 2017).

Peer Climate Effect on Motivation

The relationship between peer climate and motivation revealed a complex pattern where higher perceived autonomy support predicted both increased autonomous and controlled motivation, as well as lower amotivation. These findings align with prior work by Adie et al. (2024). Consistent with SDT, autonomy supportive environments satisfy the BPN for autonomy, competence, and relatedness, thereby potentially fostering volitional engagement, thus providing a clear explanation for this finding (Ryan & Deci, 2017). Empirical evidence corroborates this mechanism, with autonomy support linked to heightened autonomous motivation in medical students (Kusurkar & Croiset, 2015) and secondary school mathematics students (Hagger et al., 2015). However, the simultaneous increase in controlled motivation challenges traditional SDT assumptions, suggesting that in HE, autonomy support may coexist with internalised pressures stemming from performance expectations, competition, and employability concerns. This indicates that the effects of autonomy supportive peer climates are contextually nuanced, and that highly autonomy-supportive peer climates do not uniformly translate into purely autonomous motivation, highlighting a need for a more critical examination of SDT's applicability in performance-oriented university settings.

Motivation Mediational Analysis

The mediation analysis offers further nuance to these relationships. Prior research in educational settings has shown that academic motivation can mediate the association between social support and psychological well-being (e.g., Emadpoor et al., 2015). Their findings demonstrated that social support positively predicts well-being, in part through its effect on external and internal motivators. However, Emadpoor et al., (2015) work conceptualised support primarily in terms of emotional expressions such as love and care, rather than through the lens of autonomy supportive behaviours. Conversely, the findings from the present study yielded slightly different results. When psychological well-being is disaggregated into its constituent dimensions, the mediational patterns observed in the current study show subtle but potentially meaningful divergences from prior work. Peer climate did have a direct effect on predicted higher levels of life satisfaction, but this was not mediated by any motivation process. This was supported by other education research into autonomy support on life satisfaction (e.g., Diseth & Samdal, 2014). These findings possibly suggest a broader relational meaning behind life satisfaction that could be linked more to belonging and social acceptance, which is independent of academic motivation. However, the effect on flourishing was partially mediated by amotivation alone, with no other type of motivation reporting a significant effect. This effect was in contrast to Adie et al. (2024), who found that autonomous motivation fully mediated the relationship between peer climate and engagement while autonomous motivation and amotivation partially mediated the indirect relationships between peer climate and burnout. In the current study, students who perceived greater autonomy support from peers reported lower amotivation, which in turn predicted greater flourishing. A

possible explanation for this is that flourishing is a dynamic process-based form of well-being related to whether students feel purposeful and agentic. As outlined by SDT, autonomy supportive environments reduce amotivation, making students feel more competent, engaged, and purposeful (Ryan & Deci, 2017), which are key elements of flourishing. These differences further highlight the importance of distinguishing facets of psychological well-being rather than conceptualizing it as a unitary dimension.

Practical Implications

In line with the findings of Adie et al. (2024) and other SDT-based research in educational settings (e.g., Emadpoor, 2015; Ratelle et al., 2012), the present results highlight important implications for the design of peer learning opportunities to optimise the psychological well-being of HE students. Supporting students to develop more autonomous forms of motivation and encouraging autonomy-supportive interactions within group work may be particularly beneficial. Peer learning opportunities could therefore be designed to target key psychological constructs, including autonomous motivation, perceived competence, social connectedness, and autonomy-supportive peer interactions. Creating group work environments that foster choice, collaboration, and mutual support may help optimise HE students' psychological well-being. This could be achieved through autonomy-supportive intervention programmes in which students are trained to use non-controlling language, acknowledge and validate others' perspectives, demonstrate patience, and actively support their peers' motivational resources (Hastie et al., 2013). Such qualities can be fostered through structured peer-learning opportunities, including mentoring schemes and group assessments, which are designed to cultivate perspective-taking, non-controlling communication, and mutual support while reducing dominance, social exclusion, and excessive performance pressure (Collings et al., 2014). Additionally, educators should aim not only to promote autonomy-supportive climates but also to reduce peer-driven performance pressure, particularly in competitive academic environments where controlled motivation may persist, ensuring that efforts to enhance motivation do not inadvertently reinforce maladaptive forms of regulation related to employability and grades.

Limitations and Future Directions

Although the results lend support for the proposed model and hypothesis, several limitations should be considered when interpreting these findings. Firstly, the cross-sectional, correlational nature of the data means that causation cannot be inferred from these findings, highlighting the importance of longitudinal analysis in future studies using experimental study designs. The proposed research could utilise a multi-year longitudinal design, potentially assessing a trained group compared to a non-trained cohort to evaluate the long-term effects of cultivating a peer-created autonomy supportive climate in higher education. In addition to this, there may be limitations based on the adapted measure to assess peer autonomy support (Williams & Deci, 1996). In higher education, students interact with many peers across and within modules, and the instructions did not specify a single peer group. Participants may therefore have had different peers in mind when responding. This ambiguity, together with the comparatively lower internal consistency of this scale ($\alpha = .73$), may have introduced noise into the peer climate scores and attenuated its observed associations. Due to the complex multi-dimensional nature of creating a learning climate, defining the peer referent explicitly or developing a more comprehensive need-supportive and need-thwarting scale may be necessary (Adie et al., 2024) to validate the findings

further. Peer climate/influence was also the only construct measured in this design, but this is only one component of the broader learning environment, and factors such as teaching practices, assessment demands, and institutional culture might also moderate its effects. Future studies could adopt multilevel or classroom-level designs to explore how these contextual layers interact to influence motivation and well-being. Additionally, this study did not measure autonomy support from other key socialising agents, such as teachers and family. Both are established correlates of student well-being (e.g., Kotomina et al. 2024; Neufeld & Malin, 2020; Pineda et al., 2025), and some of the association attributed to peer climate may therefore reflect these unmeasured sources of support. Future studies that include these sources could further examine the unique contribution of peer climate. Future studies may also wish to build on previous work by Ratelle et al. (2012) and look at the impact of autonomy support within romantic relationships for students.

This study was also based at a Western in-person-based university. With the rise of distance and online learning reflected from the recent COVID-19 pandemic (Gopika & Rekha, 2023), future research may benefit from seeing if the same results are replicated for online courses and whether online autonomy support affects psychological well-being in the same mediational analysis with motivation type. In addition to this, there is debate about the cross-cultural universal application of autonomy support in classrooms, and while it has been argued that they are universal (Vansteenkiste et al, 2005), some researchers suggest that the benefits are only applicable to individualistic communities (Markus & Kitayama, 2003). While a high percentage of the participants were noted to come from Asian communities, the education system is still Western based; therefore, future research should consider the use of this peer climate in non-Western HE systems. The sample was also entirely undergraduate. Postgraduate and mature students often study in smaller cohorts, carry different external commitments, and form peer relationships on a different basis, so peer climate may operate differently for these groups. The findings should therefore be generalised to postgraduate, and mature student populations only with caution, and replication across these groups is needed.

While there are strengths to using life satisfaction and flourishing as distinct measures of psychological well-being, as they focus on thriving, which follows in line with SDT's emphasis on positive psychology, future researchers may opt to assess psychological well-being using a scale that focuses on the BPN. Considering the present study, BPN was merely assumed in relation to explaining the relationship between autonomy support and psychological well-being; future studies should explore this mediational relationship more directly or use scales more grounded in this theory.

Conclusion

In conjunction with the work done in the study by Adie et al. (2024) and previous SDT educational work into the well-being of students (e.g., Emadpoor, 2015; Neufeld & Malin, 2020; Ratelle et al., 2012), the current findings partially support the hypothesised model. Specifically, an autonomy supportive peer climate predicts psychological well-being, evidenced by a direct association with life satisfaction and an indirect effect noted for flourishing, mediated by reduced amotivation. These findings suggest the importance of guiding students in peer learning environments to support autonomous motivation to optimise psychological well-being. For teaching and learning practice, the findings highlight the need to intentionally structure peer interactions and collaborative tasks in ways that promote autonomy support and minimise amotivation. Additional

SDT research is needed in different educational settings, such as online learning, to fully understand the impact complex nature of peer climates on the psychological well-being of students.

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