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University of Southampton

Faculty of Environmental and Life Sciences

School of Psychology

Let Them Flourish: The Role of Autonomy at School in Adolescent Wellbeing

by

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A thesis for the degree of Doctorate of Educational Psychology

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Abstract

Faculty of Environmental and Life Sciences
School of Psychology

Doctorate of Educational Psychology

Let Them Flourish: The Role of Autonomy at School in Adolescent Wellbeing

by Laura Alice Elizabeth Pardoe

This project contributes to the growing body of research exploring how autonomy-supportive teaching practices can promote adolescent wellbeing and engagement in educational contexts. In the systematic review, I synthesised research on the relationship between autonomy support in education and adolescent wellbeing. I reviewed 31 studies examining perceived teacher autonomy support and socioemotional outcomes in secondary education. Using Keyes' Model of Wellbeing, I categorised findings into emotional, psychological, and social domains. Students who perceived greater autonomy support reported higher positive affect, resilience, and social connectedness. Autonomy support also buffered against negative outcomes such as anxiety and depression, often linked to controlling teaching styles. While the evidence consistently supports its benefits, there is a critical need for more experimental and intervention-based research.

Our correlational study examined the relationship between perceived autonomy support, authenticity, and trait reactance in relation to student wellbeing and behavioural response to autonomy-frustration. A total of 186 students (aged 16–18) completed measures of perceived teacher autonomy support, authenticity, reactance, wellbeing, and behavioural intentions. Autonomy support was consistently positively associated with authenticity and wellbeing, as well as reduced defiance. I replicated the study in a larger sample of 549 emerging adults which found similar results, and this effect was consistent at all trait reactance levels. These findings extend Self-Determination Theory by identifying authenticity as a key mechanism through which autonomy support promotes wellbeing and positive coping responses to autonomy-frustration, offering practical insights for educational practice.

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Research Thesis: Declaration of Authorship

Name: Laura Alice Elizabeth Pardoe

Title: The Role of Autonomy at School in Adolescent Wellbeing

I declare that this thesis and the work presented in it is my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a degree at this University;

2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;

3. Where I have consulted the published work of others, this is always clearly attributed;

4. Where I have quoted from the work of others, the source is always given. Apart from such quotations, this thesis is entirely my own work;

5. I have acknowledged all main sources of help;

6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;

7. No parts of this work have been published as yet.

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Chapter 1 Background

1.1 Introduction

In this introductory chapter, I outline the context and rationale for two research papers addressing the field of teacher autonomy support in secondary education. This includes the overarching trends in secondary education behavioural approaches which inspired this research, my philosophical and axiological position, ethical issues relevant to the research, as well as a brief personal reflection.

1.2 Context

1.2.1 Adolescent Social-Emotional Wellbeing

In my work across secondary schools, I have witnessed relational challenges becoming one of the most pressing concerns for school staff. Many describe feeling overwhelmed, not just by workload, but by the emotional demands of supporting students whose behaviour often signals deeper wellbeing issues. In one study, 40% of teachers in the UK reported being assaulted by pupils in the past year and 81% of respondents felt that violent and abusive behaviour among students is on the rise (NASUWT, 2023). Similarly, a 2023 survey from the EdWeek Research Centre in the USA found that 70% of educators reported an increase in significant misbehaviour compared to pre-pandemic levels. As well as problematic behavioural patterns, there is a concurrent decline in adolescent psychological health and wellbeing. In the USA, the Centre for Disease Control and Prevention reported that 40% of high school students experienced persistent feelings of sadness or hopelessness, and 20% seriously considered attempting suicide (CDC, 2023). According to NHS England's 2023 report, 20.3% of children aged 8 to 16 had a 'probable mental disorder', a figure that rises to 23.3% among those aged 17 to 19 (NHS, 2023). These concerns, along with rising rates of absenteeism (Elliot Major & Eyles, 2022) and elective home education (Adams, 2024) suggest that current approaches are failing to engage or support many learners, highlighting the urgent need to address wellbeing as a core educational priority.

1.2.2 Trends in Secondary Education Behaviour Policy

As schools grapple with challenges regarding behaviour and engagement, current trends of behavioural policy approaches appear to have become increasingly polarised, with authority-centred models on one side and student-centred practices on the other. In schools, as well as the public square of online discourse, advocates on either side seem to be increasingly entrenched. In some schools,

there is an increasing shift towards stricter 'zero-tolerance' behaviour policies (The Economist, 2023), prioritising rigid rules, immediate consequences, and a clear hierarchy of authority. Order, discipline, and structure are believed to improve academic outcomes while reducing teacher stress through strong enforcing of boundaries (Graham, 2018). However, critics including researchers and practitioners contend that such policies are overly punitive (Weale, 2019), removing opportunities for discretion or nuance in the application of behavioural policy in schools (White & Young, 2019). Research has shown that such strict behavioural measures disproportionately affect students from marginalised backgrounds and those with additional needs, exacerbating existing inequalities and often leading to increased rates of exclusion and disengagement from school (Welch & Payne, 2018). Furthermore, a systematic review of young people's views on punitive behaviour policies suggests a negative impact on wellbeing through feelings of shame, loneliness and anger (Jones et al., 2023).

There is a growing concern that such policies fail to address the root causes of behavioural issues, limiting the ability of more vulnerable students to succeed in education. In contrast, a 'trauma-informed' approach to education was borne from the understanding that adverse childhood experiences can profoundly affect a student's capacity to learn, self-regulate, and form healthy relationships (Thomas et al., 2019). This approach has evolved into broader whole-school strategies characterised by restorative practices and more flexible responding to behavioural challenges. In the UK, this model is gaining traction (Berger & Martin, 2021), with resources such as the National Education Union's 2024 toolkit supporting its implementation (NEU, 2024). Proponents argue that this approach prioritises psychological safety by recognising that both known and unknown traumas can impair student functioning. Although high-quality research is scarce, emerging evidence suggests that trauma-informed practices can effectively reduce behavioural incidents and improve mental health outcomes (Avery et al., 2020).

However, this approach is also not without criticism. Some argue that it risks pathologising common childhood experiences, interpreting typical developmental struggles through a clinical lens (Hess, 2019). These criticisms include concerns that overemphasising relational safety dilutes the importance of personal responsibility and academic challenge, particularly for students who benefit from firm boundaries (Ecclestone & Hayes, 2008). These criticisms also question the positioning of teachers as mental health practitioners within these approaches (Pondisco, 2021). In my practice, many teachers express scepticism about trauma-informed approaches, captured poignantly by one secondary teacher who remarked, *"I never wanted to be a counsellor, I just wanted to teach".*

This polarisation between student-centred and authority-centred approaches is amplified by social media platforms, which tend to reward simplified and emotionally-charged narratives. Educators and commentators may feel pressured to take clear sides, with moderate positions receiving less visibility. Discourse often maps these educational debates onto ideological divides and as a result,

discussions about educational approaches can be quickly drawn into eristics. While the long-term impact of these approaches continues to be studied, researchers, practitioners, and policymakers must continue to explore how to balance compassionate approaches to student wellbeing with their educational development.

1.2.3 Looking to Psychology

Before we question how strict school rules should be, or how staff should respond to students who transgress those rules, I believe the foundational question must be: how effectively are schools supporting students' psychological needs and intrinsic motivation? This project seeks to position teachers not at rule-enforcers, or as trauma therapists, but as effective, persuasive communicators by integrating literature from positive psychology, pedagogy and communication research. Drawing on Self-Determination Theory (Deci & Ryan, 1985), the foundation for motivation lies in environments that meet students' basic psychological needs: autonomy (a sense of volition and self-direction), competence (a sense of effectiveness and growth), and relatedness (a sense of belonging and connection with others). When these needs are met, students are more likely to flourish academically and socially, becoming active, self-motivated agents who find meaning and purpose in their educational experience.

A more recent development within Self-Determination Theory is the concept of authenticity, defined as the capacity to act in alignment with one's true self, values, and interests (Kernis & Goldman, 2006). Central to the experience of authenticity is the need for autonomy, the sense of volition and self-direction, which enables the making of choices that reflect inner values. Students who experience authenticity in their school environment, who feel recognised, respected, and free to express their intrinsic goals, tend to show higher levels of engagement, emotional resilience, and creativity. Conversely, environments that suppress a sense of authenticity lead to alienation, disengagement, or oppositional behaviours, particularly among students who do not see their strengths reflected in the dominant culture of the school. My research contribution focuses on supporting inclusive education through positive psychology, advocating that true inclusivity means providing every student with a sense of psychological fit and the opportunity to experience authenticity in school. Given that schools are often highly regulated environments that restrict student autonomy (Deci, 2009), I hope that my research can support a shift beyond polarised debates on behavioural policy, offering insights into how schools can support this vital psychological need. School can then become a place of authentic participation and a context in which every student can thrive.

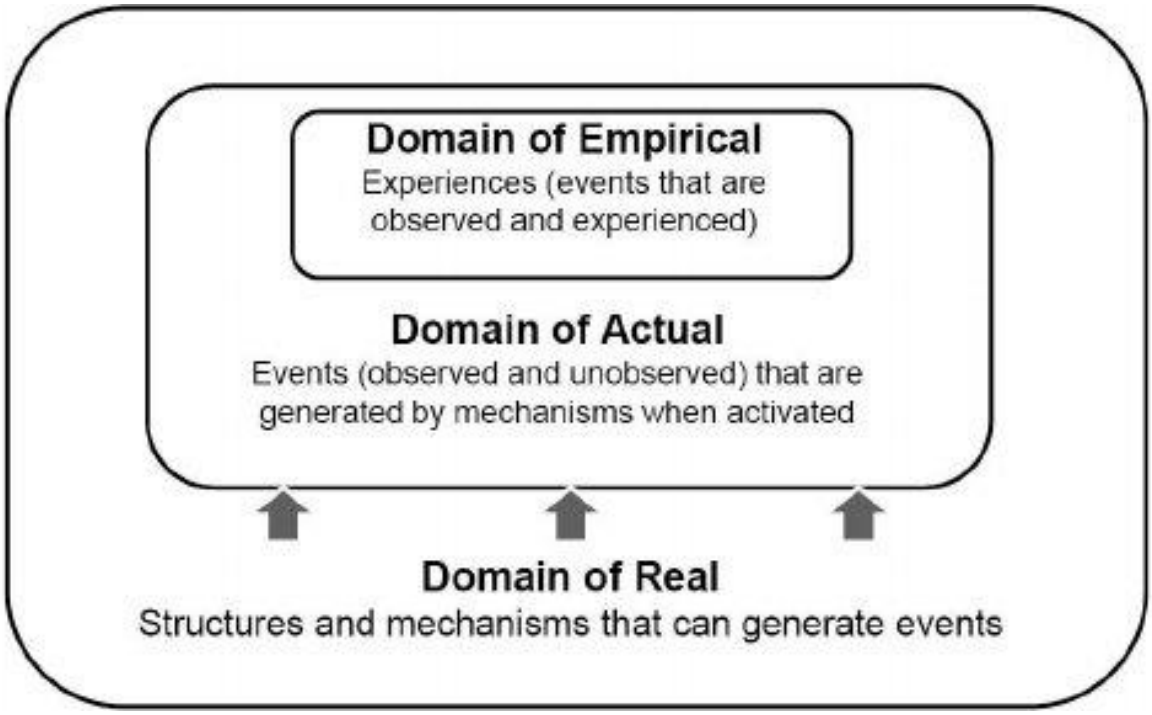
1.3 Philosophical Positioning

This research is grounded in a realist ontology and a relativist epistemology, which together support a critical realist stance (Bhaskar, 1975). Ontologically, I assume that a reality exists independently of human perception or cognition. This reality comprises structures, mechanisms, and causes, that underpin observable phenomena, even when these mechanisms are not directly visible or fully accessible. However, I acknowledge that our understanding of this reality is influenced by individual experiences, cultural lens, and historical assumptions. Epistemologically, then, I adopt a position of epistemic relativism: while reality is objective, our knowledge of it is context-bound and open to refinement (Popper, 1959).

Critical realism offers a framework that bridges positivist and interpretivist traditions, asserting that causal mechanisms exist independently of our awareness, but our knowledge of them is inevitably shaped by conceptual frameworks and must be subject to continuous scrutiny. I believe this paradigm provides an appropriate foundation for research that aims to identify, explain, and theorise regarding social-psychological phenomena. A central component of critical realism is the stratified differentiation of three ontological domains (Figure 1.1).

- The Empirical: Experiences of what individuals observe and report. In this study, these are represented by students' views of their school experiences and related psychological phenomena.
- The Actual: Events that occur, whether or not they are observed. For instance, patterns in school climate, or behavioural policies, may exist beyond student awareness but still exert influence.
- The Real: Underlying structures and mechanisms that generate phenomena, inferred through theoretically-informed analysis.

Figure 1.1 *Three Overlapping Domains of Reality in the Critical Realist Ontology (Mingers, 2004)*



Bhaskar and colleagues explicitly applied this 'laminated' conceptual framework to approach the complex and interdisciplinary nature of human wellbeing (Bhaskar et al., 2017). Central to this philosophy is the appreciation of humans as integrated beings, therefore the analysis of separate parts of any aspect of human functioning is insufficient for theory generation. In my systematic review, I applied a narrative synthesis approach to identify patterns and variations across quantitative studies. Rather than focusing on one quantitative outcome (e.g. depression), I synthesised studies across the range of wellbeing domains to provide a holistic view of how the experience of autonomy is understood to influence student social-emotional experiences. While the results were limited in terms of deeper interpretation available from methodologies with additional qualitative elements (often recommended in critical realist research), my epistemology led me to approach my findings as partial reflections of deeper causal processes, open to further refinement using different sources of information.

In the empirical component of the study, I investigated students' subjective perceptions of autonomy, relationships, and emotional experiences in school. Critical realism supported my aim to contribute to an explanatory account of adolescent wellbeing in schools informed by the lived realities reported by students. Neff and Olsen (2007) argue that the critical realist approach offers a better ontological starting point for quantitatively measuring subjective wellbeing than utilitarianism, or the empiricist focus on measurement "as if they were themselves the reality" (pp. 60). This is because critical realism recognises the value in quantitative data for theory-generation, *without* the assumption that respondents necessarily interpret items in the same way, or use the same information as each other to answer them. As long as there is a sufficient level of shared cultural understanding for constructs

like happiness, satisfaction and resilience, quantitative measures can provide data to inform our understanding of relevant mechanisms for even highly intersubjective constructs. Using this assumption, I interpreted student self-reported measures (the Empirical) as expressions shaped by, and reflective of, underlying mechanisms (the Actual), ultimately toward theorising elements of the broader structures (the Real).

1.4 Axiological Position

I believe that experiences within school environments extend far beyond childhood and adolescence, profoundly shaping who young people become and how they engage with the societies around them. In my view, student behaviour and wellbeing reflect broader societal conditions while also actively influencing them. I see psychological health and patterns of engagement at school as foundational to cultivating socially responsible, emotionally resilient, and engaged citizens. How young people understand themselves, relate to others, and respond to institutional authority, serve as vital indicators of societal health and consequently, institutional responses to student behaviour carry significant weight in shaping future societal outcomes. I argue that educational policy and school structures should be evaluated not only for their immediate impact but also for their enduring effects on individual growth and collective wellbeing.

I hold strong values regarding the preservation of spirit and vitality within children, believing it is essential for educators to support their overall wellbeing and holistic sense of self. This includes nurturing key aspects such as self-esteem, self-concept, and self-worth, which are foundational to their emotional health and development. By prioritising these elements, we help children grow not only intellectually but also as confident, resilient individuals. This commitment feels increasingly urgent in the modern era of technology and AI. As the requirement to remember factual information becomes more redundant and children spend increasing amounts of time online, education must shift further toward the development of holistic, human-centred skills. With AI capable of rapidly accessing and delivering vast amounts of information, the role of education should emphasise skills that require deep engagement, emotional connection, reflection, and meaningful application. This shift calls for learning environments that prepare students to navigate an information-rich world as well as find purpose and connection within it.

1.5 Ethical Considerations

Conducting a study on adolescent experiences without including qualitative data raises important ethical considerations regarding the nuance and completeness of the representation of their perspectives. Adolescents' experiences with wellbeing, psychological reactance, and state authenticity are inherently complex and shaped by highly personal experiences. Relying on quantitative measures

risks simplifying these experiences and potentially distorting or omitting the richness of the phenomena in question. Such omissions also risk reinforcing a power imbalance where adults and professionals define adolescent experiences of wellbeing. Future research in this field must continue to use a variety of methods, including more dialogic and participatory methods that honour the agency and experience of young people.

This tension is particularly pronounced when research is situated within polarised debates such as those between zero-tolerance and trauma-informed approaches to behaviour in schools. These are not abstract academic arguments; they shape real-world policies and the daily experiences of students and teachers. It is therefore vital to approach this area with humility and a strong commitment to integrity and as such, I position myself as a researcher committed to reflexivity. Rather than offering a definitive account, I aim to contribute to a broader conversation and maintain my awareness of the implications of my work and the power I hold to shape educational discourse. Researchers have an ethical responsibility to ensure that any assertions made within this space are grounded in robust evidence and presented with transparency about the limitations of the methods used. Overstating findings risks contributing to policy shifts that may have unintended consequences, particularly for the most vulnerable students. Therefore, I acknowledge the limitations of my design and encourage my findings to be read not as conclusive, but as one contribution among many and open to further dialogue.

1.6 Reflections

Undertaking this research filled me with gratitude for experiencing the privilege to feel authentically aligned with the educational environment where I spent most of my time during adolescence. This sense of fit, likely shaped by a complex combination of my early cultural experiences as well as a variety of supportive teaching staff, allowed me to thrive academically. While I measure highly in trait reactance - a tendency to resist perceived attempts to limit personal freedom - my strong academic goals also provided a structure that helped me manage this inclination in a highly regulated environment, allowing me to climb the academic ladder, even pursuing a doctorate. However, students whose skills and interests do not align with school curricula are understandably left feeling disconnected and disengaged and these are the students who I work with in practice and who tell me that school just is ‘not for them’. Our response to these challenges in a modern context requires a radical rethinking of educational approaches, ensuring that every young person experiences a sense of agency within stimulating, inclusive environments that can accommodate diverse strengths and goals.

Chapter 2 Teacher Autonomy Support and Adolescent Wellbeing: A Systematic Literature Review and Narrative Synthesis

2.1 Abstract

In this systematic review, I synthesised psychological research on the relationship between autonomy support in secondary education and adolescent wellbeing. Grounded in Self-Determination Theory, I define autonomy support as teaching practices that foster intrinsically motivated student engagement. I identified 31 studies that examined perceived autonomy support from teachers and social-emotional outcomes in secondary education settings. Using Keyes' Model of Wellbeing, I organised findings into emotional, psychological, and social domains. Results found that adolescents who perceived greater teacher autonomy support reported more positive affect in and out of school, stronger resilience and emotion regulation, and a heightened sense of social competence and connection. Autonomy support also appeared to buffer against negative outcomes such as anxiety, depression and aggression. While the evidence consistently supports positive associations between autonomy-supportive teaching and adolescent social-emotional functioning, I highlight a critical need for more experimental and intervention research. Taken together, these findings point to autonomy-supportive pedagogy as a promising approach to enhancing students' psychological wellbeing in secondary education.

Keywords: Autonomy Support, Adolescent Wellbeing, Self-Determination Theory, Socioemotional Development, Secondary Education

2.2 Introduction

Adolescence, typically defined as the period between aged 11-18, is a period of rapid psychological, social, and emotional development, during which autonomy becomes increasingly important for wellbeing. As schools serve as a primary developmental context where adolescents spend much of their daily lives, understanding how they can support student mental health and wellbeing is an urgent research priority. In recent years, concerns about rising rates of adolescent mental health difficulties and school avoidance have intensified (Lester & Michelson, 2024; NHS Digital, 2022). In the United Kingdom, school absence has steadily increased over the past decade, with a sharp rise in persistent absenteeism following the COVID-19 pandemic (Elliot Major & Eyles, 2022). Indicators of adolescent mental health have worsened, with recent data showing that 18% of children aged 7 to 16 report poor mental health. Among older adolescents, prevalence differs markedly

by gender, with approximately 22% of females and 13% of males aged 17 to 24 experiencing mental health issues (NHS Digital, 2022). Not limited to the UK, researchers have described this trend as a "global crisis" (Benton et al., 2021), characterised by increasing anxiety, depression, eating disorders, substance use, and self-harm (Burstein et al., 2019; Twenge et al., 2018). As educational policy and practice increasingly prioritise student wellbeing, autonomy-supportive teaching has emerged as a promising approach for enhancing adolescents' social-emotional development. In this article, I examine the relationship between adolescent perceptions of autonomy support at school and their wellbeing, using a systematic review and narrative synthesis to assess its contribution to social-emotional outcomes.

2.2.1 The Role of Autonomy in Adolescent Psychological and Social Development

Autonomy refers to volition and self-endorsed action; the ability to make choices aligned with one's interests and values. It is often conceptualised as a multidimensional construct encompassing behavioural (self-governance), cognitive (self-reliance and control), and emotional (individuation) components, reflecting decades of developmental research (Beyers et al., 2024; Zimmer-Gembeck & Collins, 2006). Attachment theory underscores the importance of autonomy for development from early childhood (Ainsworth & Bowlby, 1991; Bowlby, 1969; Mikulincer & Shaver, 2018; Murphey et al., 1963). In adolescence, social-emotional development becomes increasingly complex as young people independently navigate peer relationships, manage behavioural expectations, and respond to rising demands across home, school, and community contexts. As adolescents gain greater responsibility, they are under growing expectations to act with social awareness and moral consideration, preparing them to become prosocial, autonomous members of society (Crone & Achterberg, 2022; Soenens & Vansteenkiste, 2020). These developmental tasks are further complicated by the emotional volatility that often characterises adolescence (Guyer et al., 2016; Pfeifer & Allen, 2021). Autonomy is therefore central to adolescent development, supporting the emergence of independence, self-definition, and agency within expanding social environments (Beyers et al., 2024; Hui & Tsang, 2012).

Broader societal changes may also have heightened the psychological importance of autonomy for adolescents. Digital media and social networking platforms have reshaped how adolescents socialise, often reducing real-world opportunities for independent decision-making (Przybylski & Weinstein, 2017). Recent research suggests that while online spaces can support autonomy in certain contexts, such as allowing adolescents to explore interests and express identities, they may also introduce autonomy-thwarting dynamics, including raising social pressure, emotional dependence, unsolicited contact, and bullying (West et al., 2024). Supporting autonomy in school may therefore offer a critical counterbalance, ensuring that adolescents have access to the offline experiences of agency and volition that are essential for healthy development.

Rigid educational policies that prioritise standardised testing and compulsory academic pathways into late adolescence may limit opportunities for autonomous engagement, particularly given evidence that interest in academic achievement tends to decline during this developmental period (Dotterer et al., 2009). Globally, there is some variation regarding the academic rigour of secondary education for children aged 11–18 but typically follows a two-stage structure beginning at age 11. Around the age of fourteen, students typically specialise in a reduced range of courses alongside core subjects. Secondary education worldwide typically shares key similarities: it is predominantly classroom-based and follows a highly structured curriculum due to the strong and increasing emphasis on performance-led examinations (Teltemann & Jude, 2019). Finland, which foregoes high-stakes examinations throughout secondary school and emphasizes both teacher and learner autonomy, is often considered an exception and leading example of a more student-centred approach (Assessment & Qualifications Insight, 2021). While classroom settings and standardized curricula are common, they are not inherently autonomy-supportive and intentional pedagogical practices are essential to promote self-direction and ensure these environments meet the developmental needs of young people.

2.2.2 Theoretical Foundations: Self-Determination Theory and Keyes' Model of Wellbeing

Self-Determination Theory posits that autonomy, along with competence and relatedness, are fundamental psychological needs essential for human flourishing and engagement (Ryan & Deci, 2017). Autonomy specifically is understood to help internalise extrinsic motivations such as rewards, recognition, or social approval, transforming these motivations into more intrinsic, value-driven actions that enhance psychological wellbeing (Deci & Ryan, 2008). Proponents maintain that satisfying the need for autonomy is critical for satisfying the other two needs for competence and relatedness, as volitional action and personal agency provide opportunities for skill building and social connections (Ryan & Deci, 2000).

Recent advancements have applied Self-Determination Theory to understanding competence in emotion development and regulation. Roth and colleagues (2019) propose that, particularly during adolescence, autonomy-supportive contexts promote the development of integrative emotion regulation, a process by which individuals openly engage with their emotional experiences, reflect on them, and incorporate them into their broader sense of self. For example, an adolescent experiencing academic frustration might acknowledge the emotion, explore its source, and use that insight to adjust their study strategies or seek support. In contrast, controlled emotion regulation involves efforts to avoid, suppress, or rigidly manage emotions in ways that are externally driven or inauthentic. This might include denying feelings of sadness to conform to perceived norms or masking anxiety to meet perceived adult expectations, and such strategies have been linked to increased negative internalising symptoms (Compas et al., 2017). Research has also begun to demonstrate the role of autonomy to

support integrative emotion regulation in wellbeing (Benita et al., 2020) as well as reducing internalising and externalising psychopathology in adolescents (Brenning et al., 2022).

Also emphasising the role of fulfilling fundamental psychological needs, Keyes (2002) developed a model of adolescent wellbeing that considered flourishing (or lack of) across three dimensions: emotional, psychological, and social. Emotional wellbeing reflects hedonic aspects of one's life experience, including affect, satisfaction, and happiness. Psychological wellbeing, from the eudaimonic tradition, encompasses self-acceptance, purpose, personal growth, and mastery of one's environment. Social wellbeing refers to one's functioning within a community, including social competence, contribution, and a sense of acceptance. Robitschek and Keyes (2009) demonstrated that this tripartite model reliably captured the multidimensional nature of mental health in adolescents, making it a useful framework for research on adolescent wellbeing. Wang and colleagues (2021) used these three factors for their secondary analysis of Programme for International Student Assessment (PISA) data from over 500,000 students aged 15 across 70 societies. While the analysis treated need-support as a combined construct and therefore could not clarify the specific role of autonomy support, there were significant associations of need-support in all three areas of student wellbeing across diverse cultural contexts.

Self-Determination Theory and Keyes' (2002) model both emphasise that wellbeing involves more than the absence of distress, it includes positive functioning and flourishing (see also Su et al., 2014; VanderWeele, 2017). While Self-Determination Theory focuses on the psychological mechanisms that enable flourishing (the fulfilment of psychological needs), Keyes' model concentrates on the outcomes of flourishing across emotional, psychological, and social domains. Recent education research has integrated these frameworks to understand how both external conditions and internal motivations contribute to student wellbeing (e.g., Haw et al., 2023). This work is particularly relevant in light of growing evidence that adolescents' general and school-specific wellbeing is in decline (Casas & González-Carrasco, 2019; Shek & Liang, 2018; Tian et al., 2014). One explanation may lie in the insufficiency of school environments to meet students' evolving psychological needs. Stage-environment fit theory (Eccles, 2004) suggests that rigid school structures often clash with the developmental needs of adolescents, contributing to reduced wellbeing. In contrast, autonomy-supportive practices can offer a protective effect, creating conditions that foster engagement, self-direction, and positive development. Aligning educational environments with adolescents' psychological needs in the context of contemporary pressures is therefore essential to promoting their flourishing.

2.2.3 Autonomy Support and Adolescent Social-emotional Development

Autonomy-supportive teaching refers to teaching practices that nurture students' intrinsic motivation and create an environment where they feel free from excessive pressure. Reeve's (2009)

widely recognised model of teacher autonomy support identifies five key behaviours within the student-teacher relationship: (1) nurturing motivational resources, (2) providing explanatory rationales, (3) using non-controlling communication styles, (4) acknowledging student perspectives, and (5) offering opportunities for choice and initiative. Research has indicated that autonomy-supportive teaching practices can facilitate the development of students' self-regulation capacities (Wallace et al., 2014). This is consistent with the tenets of Self-Determination Theory, which posits that autonomy is a fundamental psychological need essential for optimal development. It also aligns with Reeve's (2009) conceptual framework, wherein the gradual transfer of responsibility from teacher to student is viewed as a core mechanism for promoting autonomous functioning.

In parenting contexts, research consistently highlights the role of autonomy support in adolescent emotional development. Systematic reviews link autonomy support to positive outcomes such as autonomous motivation, perceived competence, engagement, and positive attitudes toward school (Vasquez et al., 2015). Autonomy-granting is a key feature of parenting styles that support wellbeing, especially in reducing depressive symptoms (Yap et al., 2014). When combined with warmth and communication, autonomy support reduces externalising behaviours such as aggression and antisocial behaviour (Ruiz-Hernández et al., 2018). However, no systematic review has yet synthesised the research on autonomy-supportive teaching and its impact on student wellbeing.

Strong evidence does however support the beneficial role of autonomy-supportive teaching in academic outcomes. Systematic reviews highlight the positive impact of autonomy-supportive teaching on motivation and engagement (Gustavsson et al., 2016; Stroet et al., 2013), with longitudinal studies (Jang et al., 2016) and student-led pedagogical approaches (Hauk & Gröschner, 2022) reinforcing these findings. A recent meta-analysis of 153 studies found autonomy support from both teachers and parents supported autonomous motivation, behavioural engagement, mastery goals, self-regulated learning, self-beliefs, and performance, with distinct analyses confirming stronger effects from teacher autonomy support relative to parental autonomy support (Mammadov & Schroeder, 2023). While the impact of autonomy support on academic success is well-documented, research synthesising the field of autonomy support and social-emotional wellbeing remains limited.

2.2.4 Examining the Impact of Autonomy Support on Adolescent Wellbeing in Education

A systematic review of autonomy support and its impact on adolescent wellbeing in educational settings has yet to be conducted, likely due to the conceptual complexity of wellbeing itself. While a large meta-analysis recently demonstrated a strong positive association between self-determined need satisfaction and subjective wellbeing across various contexts (Slemp et al., 2024), no review has specifically focused on adolescents or education settings. This is particularly important because adolescence is a critical developmental period marked by significant changes in emotional regulation, identity formation, and social functioning. The multidimensional nature of wellbeing, which

encompasses emotional states, psychological functioning, and social connectedness, also complicates synthesis.

Furthermore, the variety of study designs and measurement tools used in this field limits the feasibility of a robust meta-analysis. Given the increasing recognition of the school environment's role in supporting adolescent mental health, I address this critical gap in the literature by focusing our systematic review on the role of autonomy support in student wellbeing and emotional development. Much of the research in this area has emerged in the past decade, so enough literature has accumulated to warrant a comprehensive synthesis. Therefore, this systematic review is necessary to consolidate current knowledge, identify gaps, and guide future research in this crucial area of adolescent development.

2.3 Method

To provide a comprehensive picture of the current evidence on teacher autonomy support and its impact on adolescent social-emotional wellbeing, I systematically reviewed studies published since 2012. I followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure transparency and rigor in the review process (Moher et al., 2009). In this review, I aimed to answer the question: What does the current evidence say about the relationship between teacher autonomy support across domains of emotional, psychological, and social wellbeing in adolescents?

2.3.1 Contextualising the Review

The decision to start this review in 2012 is grounded in key developments in education and mental health. Firstly, the global focus on adolescent mental health intensified after 2012, with national and international organisations, including the World Health Organisation (WHO), advocating for schools to prioritise mental health alongside academic achievement. The WHO's Mental Health Action Plan 2013-2020 highlighted the importance of addressing mental health in adolescents, stressing that mental disorders are a leading cause of disability among young people, with many conditions beginning before the age of 14 (World Health Organisation, 2013). During this period, mental health concerns among adolescents, including depression, self-harm, and suicide, began to rise sharply, particularly in the UK and USA (Twenge, 2020; Twenge et al., 2022) and this shift marked a move towards comprehensive mental health strategies, including promotion, prevention, and treatment, integrated into community and educational settings. WHO's 2020 Guidelines on Mental Health Promotive and Preventive Interventions for Adolescents emphasised the need for psychosocial interventions that promote mental health and prevent mental disorders, especially in educational contexts (World Health Organization, 2020). The early 2010s also marked notable shifts in

educational practices. Alongside the proliferation of smartphone usage, the integration of technology in classrooms during this period reshaped students' interactions with the learning environments and teachers (Consoli et al., 2023). Increased technology provided both challenges and opportunities for greater autonomy in learning, aligning with the focus of this review on teacher autonomy support.

Additionally, the global movement toward inclusive education (UNICEF, 2012) also encouraged a more holistic approach to student wellbeing, promoting the idea that schools should be meeting a wide, diverse range of student needs. The integration of social-emotional learning (SEL) into inclusive education also gained momentum after 2012. The 2013 *CASEL Guide: Effective Social and Emotional Learning Programs* marked a pivotal moment by encouraging SEL's integration into school curricula and influenced schools' focus on adolescents' emotional, psychological, and social development (CASEL, 2013). The 2013 guide became a foundational document for schools' SEL initiatives following the growing recognition of SEL's importance in 2012. The period post-2012 therefore represents a critical time in the evolution of mental health and education research, justifying the decision to begin this review at this point.

2.3.2 Search Strategy

I developed a search strategy to identify research on student-reported teacher autonomy support by adolescents aged 11–18 attending secondary education. The studies included at least one subjective measure of mental health or wellbeing.

2.3.2.1 Search terms

I devised search terms (Table 2.1) to identify studies that included adolescent self-reported measures of autonomy-supportive teaching and social-emotional wellbeing. I based our search strategy on the PICO framework, a method commonly used to structure research questions. The PICO framework stands for *Population* (adolescents), *Intervention* (autonomy-supportive teaching), *Comparison* (no comparison group was necessary in this case), and *Outcome* (social-emotional wellbeing factors). While I did not include a comparison term, I did include terms to identify studies measuring controlling teacher styles, ensuring I gathered studies that assessed either the presence or absence of autonomy support.

Table 2.1 *Boolean Search Terms*

Concept	Search Terms
Phenomenon of interest/Intervention	autonomy n2 support* OR autonomy n2 enhanc* OR autonomy n2 teach* OR control* n2 "teach* style*"
Population	adolescen* OR teen* OR youth OR student* OR pupil* OR "young people" OR education* OR class* OR school* OR learn*
Outcome	“mental health” OR emotion* OR relation* OR *social OR well?being
Exclusion Criteria (Abstract - NOT AB)	"physical education" OR athlet* OR medic* OR university OR "higher education" OR “gymnast*” OR undergrad* OR professor OR elementary OR graduate OR preschool* OR campus OR patient OR clinic*

2.3.2.2 Inclusion/Exclusion Criteria

I only included peer-reviewed studies published in academic journals and in English. During our initial scoping search, I found a wide range of study designs and geographical contexts, increasing the importance of prioritising high-quality studies. I excluded unpublished studies and theses to ensure a rigorous and feasible review process. To evaluate the impact of this decision, I searched for unpublished articles on PsycINFO, which yielded no relevant results, indicating this decision did not significantly affect findings. I also excluded studies published in languages other than English due to the insufficient reliability of automatic translation tools for interpreting complex scientific content.

During an initial scoping search, I also identified several studies within the physical education/sports psychology domain. While these studies did examine autonomy-supportive teaching and associated social-emotional outcomes, they were excluded due to significant contextual differences between physical education and academic classroom environments. PE settings often involve distinct teacher-student dynamics, goal orientations (e.g., performance vs. mastery), and physical activity-based engagement, which differ substantially from the cognitive and instructional focus in academic classroom settings. Evidence suggests that autonomy in physical education may be interpreted and operationalised differently, often emphasizing choice in movement or game strategies rather than intellectual engagement (e.g., Reeve, 2009). Including these studies would have introduce heterogeneity that would compromise the conceptual coherence of the review. To maintain focus and support a sense of consistency in the synthesis, only studies conducted in academic classroom settings were included.

2.3.2.3 Screening

On August 1, 2024, I used six databases to identify peer-reviewed research that met the inclusion criteria: PsycINFO, Medline, CINAHL, ERIC, Web of Science, and Scopus, chosen for their

relevance to psychology and education. After compiling the results in Zotero reference software, I removed duplicates.

I followed the PRISMA guidelines for the screening process and used a checklist to systematically identify studies based on clear and explicit inclusion criteria across two phases (Page et al., 2021). I reported details of our search strategy to ensure transparency, as well as support replication and scrutiny. Given the complexity and variety of social-emotional outcomes, I did not use any automation tools during the screening process. Instead, two reviewers (the first and second author) manually screened all results.

Phase 1. Two reviewers manually screened all results by titles and abstracts. The level of agreement between reviewers was high (93%). Disagreements arose mainly from differing interpretations regarding social-emotional outcomes (e.g., self-efficacy). These were progressed to Phase 2 for full-text screening to ascertain whether there were other more relevant outcome measures.

Phase 2. The two reviewers applied all inclusion criteria to the full texts of studies that passed Phase 1. In the case of disagreement, we discussed the study until they reached an agreement. The most common reasons for exclusion were the use of a composite measure of parent and teacher autonomy support without separate analysis of the teacher's contribution, as well as the use of a composite measure of self-determination without separate analysis of autonomy. In studies with multiple cohorts, I included the findings from the cohort where a majority of participants were aged 11–18. I also excluded studies that measured outcomes such as cognitive beliefs, (e.g. growth mindset and self-efficacy) without additional affective or wellbeing measures.

2.3.2.4 Data Extraction

I piloted the data extraction process with five studies and refined it before extracting data from the final studies. I then extracted data from all the included studies, recording details such as the title, date, authors, location, sample demographics (e.g., age, gender, ethnicity), the number of settings, measures used, and relevant findings. Missing data on sample characteristics (e.g., mean participant age, ethnicity) were recorded during the critical appraisal process.

2.3.3 Critical Appraisal

The first and second author critically appraised all studies using tools from the Joanna Briggs Institute (JBI) and the first author reviewed all completed forms (Appendix A1 for summary). These tools provided a structured process for appraising research, evaluating key methodological aspects such as sample selection, confounding variables, and statistical reporting. The yes/no format of the tool ensured consistency and transparency in quality assessment. Although no single appraisal tool considers all sources of bias (Kelly et al., 2024), the JBI is widely recognised for evaluating non-

randomised studies (Aromataris & Munn, 2020) which constituted the majority of studies in this review.

2.3.4 Narrative Analysis

To integrate findings from the included studies, I employed a narrative synthesis approach following the principles outlined by Baumeister and Leary (1997) and Greenhalgh et al. (2018), organising studies thematically to build a cohesive understanding of evidence. This allowed for a context-driven interpretation of findings, capturing complex interactions that are difficult to assess using numerical methods (Melendez-Torres et al., 2015). Given the heterogeneity in designs and outcome measures, a robust meta-analysis was not feasible, making narrative synthesis a more suitable choice for summarising the data (Furley & Goldschmied, 2021; Rodgers et al., 2009).

I applied Keyes' (2002) model of wellbeing to structure our analysis to ensure a theoretically coherent interpretation while addressing the multidimensional complexity of wellbeing. I categorised the studies according to Keyes' framework: emotional wellbeing (e.g., happiness, affect), psychological wellbeing (e.g., resilience, flexibility), and social wellbeing (e.g., belonging, social integration). This approach allowed us to group similar findings from various studies and assess heterogeneity, including methodology differences and study quality. In some cases, studies were included in multiple domains if their outcome measures spanned more than one aspect of wellbeing. This method provided a nuanced and flexible synthesis, retaining a multidimensional view of wellbeing while ensuring a comprehensive understanding of the diverse research on the topic.

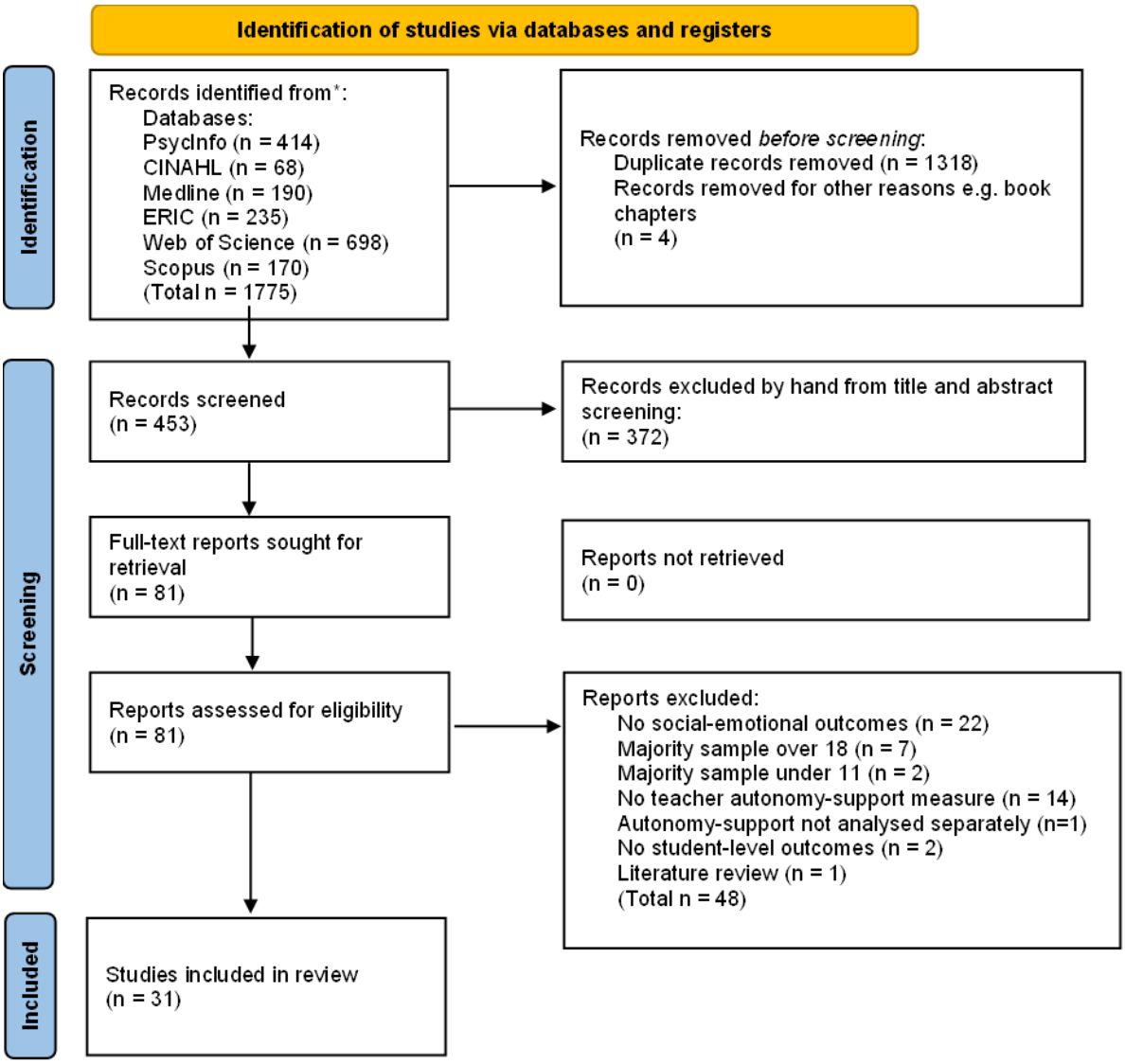
2.4 Results

From systematically searching six databases, I identified 453 unique articles. After screening titles and abstracts, I selected 81 studies for full-text review. Of these, 31 studies published between 2012 and 2024 met the inclusion criteria, comprising 30,458 participants across 15 countries. A PRISMA flow diagram detailing the screening process is provided (Figure 2.1).

Opting to include only peer-reviewed studies raised the quality standard from the initial search and I did not exclude any studies during critical appraisal (Appendix A1). The variable level of detail across the studies, scrutinised through the critical appraisal process, guided how I integrated the findings. A primary weakness of the correlational research included is their inability to establish causal relationship or determine whether teacher autonomy support *cause* observed changes in social-emotional outcomes. Additionally, cross-sectional designs can yield inconsistent estimates of model fit (Maxwell & Cole, 2007) making it difficult to draw reliable conclusions. I therefore placed greater emphasis on findings from longitudinal and experimental studies as they are better equipped to establish causality and account for potential confounding variables. By prioritising higher-quality

evidence, I increased the robustness and credibility of the synthesis, providing a clearer understanding of the unique role of teacher autonomy support in secondary education.

Figure 2.1 *PRISMA Flow Diagram*



2.4.1 Study Characteristics

I found 22 cross-sectional studies, 7 longitudinal cohort studies, and 2 randomised controlled trials (RCTs). All studies included employed quantitative research designs. While the criteria did not specifically exclude qualitative or mixed-methods studies, their focus on descriptive or interpretive insights were less relevant to the review's priority on measurable effects. Study characteristics including country and sample are reported in Table 2.2.

2.4.2 Autonomy Support Measures

The Learning Climate Questionnaire (LCQ; Williams & Deci, 1996) was the most used measure of teacher autonomy support, utilised by 15 of the studies due to its strong validity and reliability across contexts. Examples of items to determine how supportive the environment is of students' psychological needs for autonomy from the autonomy subscale include: "I feel that my teachers provide me with choices and options" and "My teachers encourage me to ask questions." This is a widely used and well-validated instrument developed by researchers with extensive expertise in self-determination theory and has demonstrated robust psychometric properties across a range of educational settings. However, some limitations include potential conceptual overlap between the constructs of autonomy and relatedness, which may confound interpretations of student perceptions. Additionally, while the LCQ has been used internationally, its conceptual foundations are rooted in Western, individualistic perspectives of motivation. As such, its applicability in collectivistic cultural contexts where autonomy may be understood or experienced differently may not be fully justified without careful cultural validation (Beyers et al., 2024).

Another more common measure included the Teacher as a Social Context Questionnaire (TASC-Q; Belmont et al., 1988). This focuses on three key dimensions of teacher behaviour: autonomy support, structure, and involvement. The autonomy subscale measures the degree to which teachers encourage student choice, acknowledge student perspectives, and minimise controlling behaviours. Example items from this subscale include: “My teacher gives me lots of chances to decide things for myself” and “My teacher listens to how I would like to do things.” The notable diversity in measures reflects the flexibility in how autonomy support is conceptualised and assessed across contexts, however, this variety can also introduce challenges related to construct overlap. Details on the autonomy support measures used across the studies are available in Appendix A2.

Table 2.2 *Summary of Included Studies*

First author (Year)	Country	Design[1]	N	% Fem.	Schools	Mean age (SD/Range)[2]
1. Vansteenkiste (2012)	Belgium	CS	1036	50	NR	15.5 (Range 12-21)
2. Shih (2013)	Taiwan	CS	512	51	4	13.5 (Range 12-16)
3. Diseth (2014)	Norway	CS	2594	48	2	NR (Range 15-17)
4. Shih (2015)	Taiwan	CS	407	46	3	13.9 (Range 12-15)
5. Pikó (2015)	Hungary	CS	385	39	3	17.3 (Range 15-20)
6. Yu, (2016)	China	L	236	57	2	14.3 (Range 11-17)
7. Kiefer, (2017)	USA	L	209	61	1	NR "Grade 6-8"
8. To (2017)	China	CS	395	53	2	16.9 (Range 13-15)
9. Simões (2018a)	Portugal	CS	645	55	19	12.3 (Range 12-14)
10. Simões (2018b)	Portugal	CS	1283	54	16	12.2 (Range 12-14)
11. Filippello (2019)	Italy	CS	263	75	1	16.1 (Range 13-20)
12. Alivernini (2019)	Italy	CS	3130	52	654	NR "Tenth graders"
13. Lan (2019)	China	CS	1113	60	10	15.9 (Range 13-18)
14. Lee (2019)	S. Korea	L	934	58	8	NR "Final year students"
15. Peng (2020)	China	CS	1912	63	5	14.7 (*SD* 1.38)
16. Schmidt (2020)	USA	CS	381	50	2	13.6 (*SD* 0.91)
17. Lee (2020)	S. Korea	L	914	58	8	18.0
18. Charlot Colomès (2021)	Mauritius	CS	271	53	2	15.5 (*SD* 1.15)
19. Collie (2021)	Australia	CS	319	49	NR	14.0 (*SD* 1.00)
20. Zhang (2022)	China	L	1397	48	14	NR "Approx. age 12"
21. Gueta (2022)	Israel	CS	181	46	NR	NR (Range 13-15)
22. Lee (2022)	S. Korea	CS	1015	57	8	NR "High school"
23. Martinek (2022)	Austria	CS	812	63	NR	16.0 (*SD* 1.72)
24. Lan (2022)	China	CS	738	55	NR	15.8
25. Ma (2022)	China	CS	1346	52	NR	12.5 (Range 10-15)
26. Kleinkorres (2023)	Germany	L	3446	50	178	10.8 (*SD* 0.49)
27. Cheon (2023)	S. Korea	RCT	1178	51	24	13.7 (*SD* 1.5)
28. Paulmann (2023)	UK	RCT	250	53	NR	12.2 (*SD* 1.89)
29. Liu (2023)	China	CS	683	45	2	16.0 (*SD* 1.04)
30. Collie (2024)	Australia	CS	501	51	NR	14.0 (Range 13-16)
31. Kristensen (2024)	Norway	L	1453	61	17	17.0 (Range 16-25)

[1] Design: C=Cross-sectional, L=Longitudinal, RCT=Randomised Controlled Trial.
[2]Mean age reported with standard deviation if available; otherwise, range, school grade, or qualitative description provided.
[3]NR = Not Reported

2.4.3 Emotional Outcomes

Table 2.3 presents the range of outcome measures used across the 31 studies included in this review, which examine the relationship between autonomy support and aspects of emotional and social wellbeing. Drawing on Keyes' model of wellbeing, the measures have been grouped into three overarching domains: emotional, psychological, and social. Within each domain, subdomains reflect specific facets of wellbeing (e.g., affect, resilience, competence), and the table identifies the specific outcomes assessed in each study.

Table 2.3 *Social-Emotional Outcomes by Domain of Wellbeing*

Domain	Subdomain	Outcome measures
Emotional	Affect in school	Positive/Negative affect (12, 19, 28, 26, 30) Vitality (23)
	General Affect	Anxiety (6) Depression (6, 8, 14, 17, 20) General affect (13)
Psychological	Resilience	Burnout (4, 14, 17, 22) Mental wellbeing (31) Grit (13) Hope (29)
	Regulation	Emotion regulation (19, 21, 30) Phone addiction (15) Perfectionism (2) School refusal (11)
Social	Competence	Prosociality (9, 10, 24, 27) Conflict resolution (19, 30) Challenging behaviour (1, 5, 9, 10, 25)
	Connection	Trust (28) Belonging (7, 18, 23) Mattering (16)

2.4.4 Narrative Synthesis by Wellbeing Domain

2.4.4.1 Emotional Wellbeing

The emotional wellbeing domain included 14 studies focusing on school-related and general affect and satisfaction. These studies used outcome measures including mood, life satisfaction, and negative symptoms like depression, anxiety, and burnout.

2.4.4.1.1 Affect in School

Five cross-sectional studies found support for beneficial effects of teacher autonomy support on measures of subjective mood when in school. Martinek et al. (2020) found that teacher autonomy support was associated with greater vitality (referring to a sense of aliveness, energy, and vigour) as well as contentment in school, mediated by students' sense of relatedness to teachers and perceived competence. In a large sample of immigrant students in Italy, Alivernini et al. (2019) found that teacher autonomy support was significantly associated with positive affect at school. The authors suggest their results point to a potential link to emotional wellbeing for students who may be more at risk of poorer school experiences due to challenges related to immigration and social assimilation. Similarly, Collie et al. (2021) found that teacher autonomy support was associated with reduced negative emotions at school among Australian students. In 2024, Collie et al. replicated these findings with a new sample, this time using the Learning Climate Questionnaire instead of bespoke items, this time finding an additional link with increased positive emotions.

Multiple studies in the review linked teacher autonomy support with reduced negative affect (e.g., Cheon et al., 2023; Collie et al., 2021; Lan et al., 2019) and increased positive emotional experiences at school (e.g., Charlot Colomès et al., 2021; Collie et al., 2024; Simões et al., 2018b), patterns that resonate with theoretical perspectives on the role of perceived control in shaping achievement emotions (Pekrun, 2006).

Supporting the directional relationship of teacher autonomy support on school affect, one large longitudinal study (N = 3446) in Germany by Kleinkorres et al. (2023) found that teacher autonomy support positively predicted school enjoyment and satisfaction using bespoke measures, though this effect diminished as students grew older. Paulmann and Weinstein (2023) provided causal evidence for the impact of teacher autonomy support on students' school-related affect. In their experiment, students who listened to teachers using a controlling communication style reported higher levels of negative affect and were less willing to share personal information with those teachers. These findings suggest that when teachers use controlling language, it negatively influences students' emotional experiences and reduces students' sense of trust.

2.4.4.1.2 General Affect

Beyond school-related affect, three cross-sectional studies examined teacher autonomy support with general life satisfaction. One of the largest cross-sectional studies in this review (N = 2594) conducted in Norway by Diseth and Samdal (2014) found a strong positive relationship between teacher autonomy support and life satisfaction, as well as school performance. Teacher autonomy support predicted achievement goals, which in turn predicted both perceived school performance and life satisfaction. This effect was more pronounced for boys, who were more likely to connect teacher autonomy support with performance goals (wanting to achieve high grades) rather than personal

mastery goals (learning for the sake of understanding). In a large sample of Chinese students (N = 1912), Peng et al. (2020) also found a moderate association between teacher autonomy support and life satisfaction. However, using the same life satisfaction measure, To et al. (2017) found no evidence of a direct effect of teacher autonomy support on life satisfaction in a smaller (N = 395), slightly older sample of Chinese students. While Peng et al. (2020) used the Learning Climate Questionnaire to measure teacher autonomy support, To et al. (2017) used an adapted version of Perception of Parents (POPS), which may have lacked the precision and appropriateness needed for the teacher-student context.

Four studies examined teacher autonomy support in relation to negative affect using measures of depressive symptoms. To et al. (2017) found higher teacher autonomy support was associated with lower depressive symptoms in a cross-section of Chinese students. They also found teacher autonomy support was positively correlated with stronger perceptions of 'nurturance rights', referring to their sense of entitlement to care, protection, and encouragement from adults, which have been linked to increased wellbeing (Ruck et al., 2014). Further evidence of the link between teacher autonomy support and depression in Chinese students was found in Lan and Zhang (2019), as teacher autonomy support was linked with measures of both positive and negative affect. Providing causal support, Yu et al. (2016) conducted a longitudinal study with Chinese students, finding that teacher autonomy support enhanced autonomy need-satisfaction and school engagement, in turn reducing anxiety and depression scores, indicating school engagement mediated this relationship. Adding further support, the strongest evidence came from Zhang et al. (2022), who measured teacher autonomy support and depression across two cohorts of students across fourteen schools. Autonomy support was associated with lower levels of depressive symptoms across two student cohorts, with this relationship being stronger among students from lower socioeconomic backgrounds. This suggests that teacher autonomy support may serve as a protective factor, particularly for students facing greater socioeconomic disadvantage, by helping to buffer against declines in mental health over time.

2.4.4.2 Psychological Wellbeing

This domain included twelve studies regarding psychological wellbeing, including emotion regulation and resilience. In educational settings, much of the research regarding psychological wellbeing and resilience related to engagement in academic pursuits.

2.4.4.2.1 Resilience

Five studies found evidence of a link between teacher autonomy support and resilience against academic challenges. In a cross-sectional study, Shih et al. (2015) found that teacher autonomy support negatively correlated with burnout indicators such as exhaustion, cynicism, and lack of efficacy in Taiwanese students. Autonomy need-satisfaction emerged as a strong negative predictor of

cynicism, suggesting that students perceiving greater autonomy in their learning environment may resist emotional disengagement, though the correlational design limits causal claims. Stronger longitudinal evidence from Kristensen and Jeno (2024) further supports the role of teacher autonomy support in resilience. Norwegian students with higher teacher autonomy support levels exhibited greater psychological wellbeing and lower academic stress over time, with changes in teacher autonomy support positively influencing trajectories of wellbeing while reducing self-reported stress. Within-participant analyses found students who reported high initial levels of teacher autonomy support in upper secondary school experienced a more rapid decline of stress. Participant attrition was a limitation, though the authors attempted to mitigate its effects through statistical methods.

Three studies conducted by the same lead author in South Korea also found positive support for the role of teacher autonomy support in enhancing wellbeing and protecting against stress and burnout (Lee et al., 2019; Lee et al., 2020; Lee et al., 2022). In the 2019 longitudinal study, teacher autonomy support, but not parental support, predicted decreases in burnout across four time points, even after controlling for teachers' academic pressure. From the outset, students with higher teacher autonomy support and lower socioeconomic status reported lower levels of burnout, suggesting that teacher autonomy support may serve as a protective factor, particularly for students from disadvantaged backgrounds. However, the study did not clarify how it accounted for high attrition rates, raising concerns that dropout bias may have skewed results toward more engaged students. Building on this, the 2022 cross-sectional study found that teacher autonomy support amplified the beneficial effect of peer support in reducing academic hatred, suggesting an interaction of teacher and peer influences which impact students' emotional responses to academic work. Another longitudinal study in 2020 found higher levels of teacher autonomy support related to a faster decrease in emotional exhaustion within participants. At the individual level, however, teacher autonomy support did not influence trajectories of emotional exhaustion, whereas teacher pressure had significant negative effects. While the study accounted for attrition between the third and fourth time points, acknowledging that time point 4 took place after students transitioned to a new educational phase, dropout rates remained a notable limitation.

Emerging correlational evidence suggests teacher autonomy support may play a role in supporting "grit", a psychological resource associated with resilience (Duckworth et al., 2007). Lan and Zhang (2019) found that both teacher autonomy support and grit positively influenced affect in school-transitioning students in China, with grit acting as a buffer against the challenges of relocation. Liu et al. (2023) explored teacher autonomy support and hope, a complementary construct to grit that supports motivation to persist towards goals (Raphiphatthana & Jose, 2021). They compared 'left-behind' (LBC) Chinese students living with extended family with non-LBC students and found that across both groups, teacher autonomy support significantly enhanced hope, mediated by autonomy need satisfaction. This effect was stronger for non-LBC students, which the authors suggested may reflect a greater autonomy drive among these students due to higher levels of parental contact.

Together, these studies suggest that teacher autonomy support correlates with traits of psychological resilience; however, there was no longitudinal or experimental evidence in this area to support causal claims.

2.4.4.2.2 Self-Regulation

Self-regulation refers to capacities which enable individuals to guide their thoughts, feelings, and behaviours in a purposeful manner (Kelley et al., 2019). Two cross-sectional studies by the same lead author in Australia provided evidence of the link between teacher autonomy support and emotion regulation. Collie (2021) found that teacher autonomy support, along with support for competence, was positively associated with both students' perceived competence in emotion regulation and competence in conflict resolution, as well as lower levels of negative affect. Collie et al. (2024) found similar results in a new sample, where teacher autonomy support was again positively associated with global perceived social-emotional competence, which was in turn related to self-reported increased positive and reduced negative affect. An unexpected correlation also emerged, where teacher autonomy support was negatively associated with students' perceived competence in emotional awareness. While the findings overall suggest teacher autonomy support is linked to students' perceptions of their being capability in social-emotional interactions, its impact on the specific aspect of emotional awareness may be inconsistent and requires further study.

Two cross-sectional studies provide further indication of the role of teacher autonomy support in students' ability to regulate their responses to challenges. In Italy, Filippello et al. (2019) found that perceived teacher psychological control was linked to school refusal. This study used the School Refusal Scale, which focuses on the ability to cope with stressors in school, aligning with psychological wellbeing. They found that a controlling teacher style frustrated students' need for autonomy and positively correlated with decreased perceptions of ability to manage stressors, interpreted as increased school refusal. Echoing this finding, Gueta and Berkovich (2022) also found teacher autonomy support linked to challenges with self-regulation in school in a sample of Israeli students who had already left mainstream education settings and were considered 'at risk'. They found teacher autonomy support was negatively associated with dropout intentions, as measured by problems with discipline and difficulties following school rules. This relationship was mediated by students' sense of authenticity (feeling of being one's 'true self') and may provide a key mechanism regarding the benefits of teacher autonomy support. This study did however use the competence subscale as well as autonomy support, suggesting a possible overlap between these psychological needs that could influence how teacher support impacts student drop-out.

Two further studies assessed teacher autonomy support and aspects of behavioural regulation related to wellbeing. Shih et al. (2013) looked at the role of teacher autonomy support in student perfectionism – an emotional and behavioural regulatory strategy that can either buffer against or contribute to academic stress. Described as a 'double-edged' trait (Stoeber & Rambow, 2007),

perfectionism has adaptive aspects (e.g., high personal standards, organization) as well as maladaptive aspects associated with burnout (e.g., excessive self-criticism, stress, and burnout). Shih et al. (2013) found that teacher autonomy support was linked to adaptive perfectionism, whereas maladaptive perfectionism was primarily influenced by parental autonomy. These findings suggest that while teacher autonomy support may encourage the more constructive aspects of perfectionism, parental autonomy may contribute to the more harmful, stress-inducing elements of the trait. Peng et al. (2020) investigated teacher autonomy support and problematic smartphone use, a contemporary behavioural regulation challenge. Their findings indicated that higher teacher autonomy support corresponded with lower problematic smartphone use, suggesting a beneficial role in supporting behavioural regulation. However, this protective effect diminished, and even reversed, when students' life satisfaction was low, highlighting that the impact of teacher autonomy support may depend on broader aspects of student wellbeing. While both studies show promising results regarding autonomy-support in school, independent replication and further longitudinal or experimental research is needed to support these findings.

2.4.4.3 Social Wellbeing

This domain includes 13 studies which included measures related to interpersonal factors, such as perceived social competence, prosocial and antisocial behaviour, social connection, and broader sense of belonging.

2.4.4.3.1 Social Competence

Research in this review highlights the role of teacher autonomy support in shaping students' prosocial behaviours. In a study comparing left-behind students, Lan et al. (2022) found a positive correlation between teacher autonomy support and prosocial behaviour, moderated by narcissism, which acted as a buffer for left-behind students by improving emotional stability in the absence of parental support. Similarly, Collie (2021) demonstrated that teacher autonomy support was positively associated with students' competence in conflict resolution and emotion regulation, leading to increased prosocial actions and fewer conduct problems. Collie et al. (2024) replicated these findings in a new sample. The most robust causal evidence comes from Cheon et al. (2023), who conducted a large randomised controlled trial to test an autonomy-supportive teaching intervention. The intervention significantly reduced peer victimisation, with students in the experimental group experiencing less victimisation at follow-up and showing greater willingness to act as supportive bystanders.

Using latent class analysis, Simões et al. (2018a, 2018b) examined teacher autonomy support and prosociality within a framework that included multiple sources of autonomy support from teachers, parents, and mentors. They identified four profiles based on patterns of autonomy support

across these sources. They examined patterns of attunement, which refers to the alignment or responsiveness of different sources of autonomy support, such as teachers, parents, and mentors, toward a student's needs. High attunement means that these sources are consistently and effectively providing the right kind of support in a way that is congruent with the student's needs for autonomy. Low attunement, on the other hand, indicates that the support from these sources is mismatched or insufficient, which could negatively impact the student's social and emotional development. Thus, in the studies by Simões et al. (2018a, 2018b), "attunement" refers to the degree to which the support from different individuals (teachers, parents, and mentors) aligns and reinforces each other in supporting the student's autonomy. High attunement across all sources correlated with greater prosociality and self-regulation, while low-attuned and mis-attuned profiles were linked to increased antisocial behaviour. Notably, teacher autonomy support uniquely contributed to these social outcomes, beyond parental or mentor influences. Despite these benefits, patterns of autonomy support did not fully mediate the effects of socio-economic status, which was negatively correlated with prosocial behaviour, suggesting that structural disadvantages may limit the impact of autonomy support.

In addition to promoting prosociality, three studies found correlational evidence that teacher autonomy support is associated with reduced antisocial tendencies, such as aggression. Vansteenkiste et al. (2012) found that higher teacher autonomy support was associated with lower levels of problem behaviour and aggression, particularly when paired with clear expectations and structure. Ma et al. (2022) also found a negative association between teacher autonomy support and problem behaviour in Chinese adolescents and identified a growth mindset as key buffer against the effects of low teacher autonomy support. Pikó and Pinczés (2015) found that higher teacher autonomy support was associated with lower levels of aggression across three different educational settings in Hungary; academic-focused, sports-focused, and mixed programs. Results revealed a nuanced interaction, where students reported increased boredom when teacher autonomy support was combined with a ‘laissez-faire’ teaching approach. Unexpectedly, controlling teacher behaviours were positively associated with self-efficacy, though the authors suggest that while authoritarian approaches may enhance short-term academic focus, they could hinder longer-term social-emotional development.

2.4.4.3.2 Relatedness

Teacher autonomy support not only influences students' social behaviours but also their perceptions of relationship quality with teachers and within the wider school environment. Martinek et al. (2022) found that teacher autonomy support positively correlated with relatedness to teachers using a relatedness scale, alongside higher levels of vitality and contentment in school. Charlot Colomès et al. (2021) also found a positive correlation between teacher autonomy support and perceptions of relatedness at school in Mauritian students. However, unexpectedly, students who perceived high

levels of teacher autonomy support reported feeling less connected to their teachers, suggesting a potential trade-off between autonomy and closeness in this context.

In the United States, Schmidt et al. (2020) explored the role of teacher autonomy support with sense of 'mattering', defined as the perception of significance in a social context and has been linked to prosocial behaviour intentions (Virat et al., 2024). Their cross-sectional study in two rural towns with predominantly working-class students found that teacher autonomy support positively correlated with both school- and societal-mattering, with higher socio-economic status students more likely to report elevated scores. Age and gender did not appear to have an effect. As with other studies in this section, the correlational design limits causal claims; however, this study suggests that teacher autonomy support may have a protective function for an important marker of social wellbeing for students with fewer societal resources.

Two studies provide stronger evidence of a directional relationship between teacher autonomy support and relational quality. In a longitudinal study conducted in a large urban school in the United States, Kiefer and Pennington (2017) found that teacher autonomy support significantly influenced students' sense of school membership, a measure focused on student perceptions of relational quality with teachers and peers. They also found that teacher respect played a key role in students' perceptions of belonging, particularly for boys. In the experimental study by Paulmann and Weinstein (2023), students not only reported more negative affect when exposed to controlling teacher communication, but also a reduced willingness to cooperate with these teachers or disclose personal information to them. Despite the relatively brief exposure, the study reported moderate effect sizes, suggesting that even subtle cues in teacher communication can significantly impact students' emotional and relational responses.

2.5 Discussion

In this review, I synthesised research on teacher autonomy support and its impact on students' social-emotional wellbeing, guided by Keyes' Model of Wellbeing and Self-Determination Theory. The findings highlight the positive influence of teacher autonomy support on students' wellbeing across emotional, psychological, and social domains.

2.5.1 Summary of Findings

Across emotional, psychological, and social wellbeing domains, teacher autonomy support was consistently associated with positive outcomes. In the emotional domain, it was linked to reduced depression and anxiety and increased life satisfaction and school vitality, with longitudinal and experimental studies offering stronger causal evidence. These findings align with Self-Determination Theory, which posits that autonomy-supportive environments enhance positive emotions and support

hedonic wellbeing. In the psychological domain, autonomy support correlated with lower burnout and stress, greater hope and grit, and improved emotion regulation. Some evidence suggests a possible role for supporting behavioural regulation regarding problematic phone use and maladaptive perfectionism, however these are single, correlational studies which require further investigation. Socially, autonomy-supportive teaching enhanced prosocial behaviour, interpersonal competence, and relatedness with teachers and peers. While one finding suggest a possible trade-off between autonomy and closeness, the broader pattern including the more robust research designs point to autonomy support as a contributor to students' social connection to peers and trust in teachers in school.

These findings suggest a symbiotic relationship among emotional, psychological, and social wellbeing, where growth in one domain supports and amplifies development in the others. Teacher autonomy support appears to initiate this positive cycle by fostering resilience and adaptive emotion regulation which are key capacities that promote emotional stability and enable students to manage academic and interpersonal challenges effectively. In turn, improved emotional regulation enhances social functioning by helping adolescents navigate relationships and maintain a strong sense of school belonging through prosocial action. Through these mutually reinforcing processes, autonomy-supportive teaching creates a foundation for adolescents to thrive across multiple, interconnected dimensions of wellbeing.

Overall, the evidence from this narrative synthesis suggests that teacher autonomy support contributes to the promotion of students' wellbeing across all three dimensions identified by Keyes: emotional, psychological, and social. The integration of Self-Determination Theory highlights how autonomy-supportive environments enhance intrinsic motivation and facilitate emotion regulation, resilience, and social connection. However, while the studies included showed near unanimous positive associations and effects of autonomy support, the variability in study designs and quality calls for caution in drawing definitive conclusions. Future research should refine measurement tools, continue to address confounding variables, and explore the long-term effects of teacher autonomy support on student wellbeing.

2.5.2 Theoretical Implications

The findings of this review provide support for the theoretical foundations of Self-Determination Theory (Ryan & Deci, 2017). Our review extends this framework by demonstrating that teacher autonomy support is not only beneficial for academic outcomes as prior work has shown, but also plays a critical role in supporting adolescents' emotional, psychological, and social wellbeing. These findings reinforce the view that autonomy is not simply a pedagogical tool, but a central developmental need with wide-ranging implications for adolescent adjustment. Our review also supports the use of Keyes' model to understand adolescent wellbeing which provided a complementary lens through which to interpret these findings. Our synthesis shows that autonomy-

supportive teaching contributes meaningfully across all three domains: It is associated with enhanced affect and vitality (emotional wellbeing), improved resilience and self-regulation (psychological wellbeing), and increased feelings of school belonging and social connection (social wellbeing). Taken together, these results suggest that autonomy support is not merely one pathway to wellbeing, but a foundational mechanism that enables adolescents to thrive across multiple spheres of functioning.

Emerging extensions of Self-Determination Theory underscore the significance of autonomy for emotion regulation and psychological integration (Roth et al., 2019). Several studies in our review support this perspective, showing that teacher autonomy support is associated with more adaptive forms of emotional regulation, which in turn predict better psychological outcomes such as resilience, reduced depressive symptoms, and increased positive affect. These findings align with the broader proposition that autonomy is a foundational condition for the process of integrative emotion regulation: making sense of internal experiences and responding more flexibly to environmental demands. Our findings also align with broader evidence, for example, Donald and colleagues (2021) who conducted a large-scale meta-analysis demonstrating that autonomy-supportive contexts are consistently associated with prosocial outcomes and reduced antisocial behaviour across age groups, genders, and cultures. Their findings reinforce the proposition that autonomy facilitates the internalization of social values and promotes prosocial functioning. Our review extends this theoretical framework by applying it to secondary education, showing that teacher autonomy support contributes not only to emotional and psychological wellbeing but also to social functioning during adolescence, a critical period for identity formation and moral development. This is further supported by research on prosocial motivation, which has shown that autonomy enhances the emotional and motivational benefits of helping others, leading to greater wellbeing and sustained engagement (Kelley et al., 2023).

These findings are consistent with a recent meta-review by Ryan et al. (2022), which synthesised 60 meta-analyses spanning the six mini-theories of Self-Determination Theory and their applications across diverse domains. This comprehensive review provides compelling evidence for the theory's core claims, including the benefits of autonomy-supportive contexts for basic psychological need satisfaction and wellbeing. It also confirms the universality of these processes across age groups, genders, and cultures. By focusing specifically on teacher autonomy support during adolescence, our review contributes to this broader evidence base by highlighting how autonomy support functions as a developmentally sensitive mechanism that promotes holistic adolescent flourishing in the school context.

Both Donald et al. (2021) and Ryan et al. (2022) highlight the need for greater domain-specific and developmentally sensitive syntheses within the Self-Determination Theory literature. Our review responds directly to this need by focusing on adolescence, a period marked by unique emotional, psychological, and social challenges, and by examining autonomy support within the specific relational context of secondary school teaching. Furthermore, by integrating Self-Determination Theory with Keyes' tripartite model of wellbeing, our review maps autonomy support

onto a multidimensional conception of flourishing, offering a more holistic account of how supportive teaching practices promote adolescent adjustment. These effects are best understood within the broader context of stage–environment fit theory, which emphasises the importance of aligning environmental demands with adolescents' developmental needs (Eccles, 2004). However, much of the existing literature remains correlational, raising questions about the directionality of effects. For example, students with higher academic motivation may be more likely to perceive their teachers as autonomy-supportive, while those experiencing behavioural difficulties may perceive greater control, reinforcing cycles of disengagement. Despite these complexities, the evidence base strongly supports the view that autonomy need satisfaction plays a foundational role in psychological wellbeing.

2.5.3 Limitations

This review provides an initial foundation for understanding the evidence on the role of teacher autonomy support in adolescent wellbeing. However, several limitations must be considered. First, the review focused specifically on teacher autonomy support, excluding the other essential components of Self-Determination Theory, such as competence and relatedness. By narrowing the scope to autonomy support alone, this review was unable to explore the synergistic effects of all three components. Future research would benefit from investigating how teacher autonomy support, competence, and relatedness interact to promote emotional, psychological, and social outcomes for students. Additionally, the scope of the review was also narrowed by concentrating solely on adolescents in secondary education, excluding younger and older learners. While autonomy is a universal psychological need, developmental differences between younger and older students complicate the generalizability of the findings across all educational levels. Varying practices across primary, secondary, and higher education also affect how autonomy support is implemented and its impact on students' wellbeing. Future reviews should examine teacher autonomy support across a broader range of educational stages, from primary to higher education, to more comprehensively understand its role in diverse contexts.

Another limitation of this review is its reliance on a narrative synthesis, which, while providing a richer, context-driven interpretation of the findings, is inevitably influenced by the authors' subjective interpretation. Unlike quantitative synthesis methods that rely on statistical aggregation to objectively measure effect sizes, a narrative approach lacks the same precision and generalizability. As the field continues to grow, future research should incorporate meta-analytic techniques, which can quantify effect sizes and provide a more robust evaluation of the impact of teacher autonomy support. Despite these limitations, this review points to several clear directions for future research. Addressing these gaps, such as exploring the interactions between autonomy, competence, and relatedness, expanding research across educational levels, and incorporating meta-analysis, will further refine our understanding of how teacher autonomy support influences adolescent wellbeing across emotional, psychological, and social domains. These efforts will ultimately enhance

the evidence base for the role of autonomy support in educational settings and its contribution to positive developmental trajectories in students.

2.5.4 Future Directions

To establish causal links between teacher autonomy support and adolescent wellbeing, future research should prioritise experimental and quasi-experimental designs, such as randomised autonomy-support interventions. This will help establish more definitive causal relationships between autonomy-supportive teaching and social-emotional outcomes. Future research should address two key questions related to the processes underlying processes:

First, how does autonomy-supportive teaching foster social-emotional outcomes? Several potential mediators warrant further investigation. Self-regulation may play a key role, as autonomy-supportive environments promote better emotional and behavioural control, critical for adolescents' mental health and wellbeing (Martinek et al., 2020; Meuwissen & Carlson, 2019). Intrinsic motivation could also mediate the effects of teacher autonomy support, with supported students more likely to engage in school activities for personal satisfaction rather than external rewards (Chang et al., 2016; Núñez & León, 2016). Self-efficacy may be another mediator, as greater autonomy support can enhance students' confidence, positively impacting emotional wellbeing (Ito et al., 2024; Miao & Ma, 2023). Social connectedness likely also mediates this relationship, with autonomy-supportive teaching fostering stronger peer relationships and a greater sense of school belonging (Diseth et al., 2017; Froiland et al., 2016; Nelson et al., 2014). Identity formation may be influenced too, helping adolescents develop a clearer, more positive sense of self (Audet et al., 2022; Weinstein et al., 2017). Executive function capabilities could also mediate this relationship, supporting students' adaptability to new situations and challenges (Sosic-Vasic et al., 2015). Finally, reactance, or resistance to threats to autonomy, may be reduced in autonomy-supportive classrooms, making students feel more comfortable and open to learning (Solovei et al., 2024). Rigorous testing of these mediators can deepen our understanding of how teacher autonomy support impacts adolescent wellbeing and inform targeted educational practices.

Second, for whom, or under what circumstances, does autonomy-supportive teaching support social-emotional outcomes? Examining whether such individual differences moderate (i.e., qualify) an experimental or intervention effect can test assumptions about the processes underlying the effect (Underwood, 1975). Individual factors such as socioeconomic status and gender, as well as personality traits may moderate how teacher autonomy support impacts students' wellbeing. Students from disadvantaged backgrounds may respond differently to autonomy-supportive teaching if they have historically encountered more controlling or punitive institutional environments. Similarly, personality traits such as self-regulation, need for structure, or openness to experience may interact with the degree of perceived autonomy to shape outcomes such as emotional resilience, engagement, or social

belonging. Emerging evidence suggests students prone to reactance (i.e. sensitive to threats to their autonomy) may be more responsive to autonomy support (Solovei et al., 2024).

Investigating mediating and moderating factors would deepen our understanding of autonomy-supportive teaching mechanisms and offer clearer guidance for educational practice and intervention design to promote adolescent wellbeing. To conclude, incorporating both mediators and moderators into intervention research aligns with best practices for establishing a clear understanding of how and for whom teacher autonomy support fosters positive socioemotional outcomes, as well as respond to recent calls for motivation research in educational psychology to move beyond confirmation of established theories toward clarifying underlying mechanisms and boundary conditions (Murayama & von Keyserlingk, 2025).

2.5.5 Recommendations for Future Research

To guide future research, I highlight essential considerations in study design. First, researchers should employ the most widely used and validated tools to measure autonomy support to ensure comparability across studies. Researchers are also encouraged to use additional measures to capture a broader understanding of autonomy support in different educational settings. Second, researchers should assess adolescent wellbeing using comprehensive measures across the three domains of emotional, psychological, and social wellbeing. Third, future studies should comprehensively assess putative mediators and moderators to identify how and for whom autonomy support has the greatest impact. Finally, providing detailed participant demographics, such as socioeconomic status and ethnicity, enhances the ability to generalise findings to diverse populations. Such demographic information is also crucial for understanding how autonomy support may be experienced differently across various populations. By integrating these methodological recommendations, future research can build a more sufficient and less heterogeneous evidence base, crucial for conducting future meta-analyses that can draw more robust conclusions.

2.5.6 Implications for Educational Policy and Practice

The results of this review underscore the growing need for educational policies to prioritise the process of learning, not just the product. In line with the recommendations from proponents of Self-Determination Theory, schools should focus on creating environments that support student wellbeing, with measures of accountability and performance extending beyond academic achievement to include emotional and psychological development (Ryan et al., 2023). Given the global decline in adolescent mental health, compounded by modern "screen-based" childhood experiences, the need for real-world autonomy has never been more critical. Teacher training must equip educators with the skills to balance structure with enhanced autonomy to foster psychological wellbeing. While external factors such as digital media overload, poor diet, and a range of global stressors (AAP, 2019)

exacerbate mental health challenges, schools can immediately address wellbeing by integrating need-supportive practices into the curriculum. It is imperative that educational systems embed autonomy support as a core component of student development to ensure that it becomes a recognised priority globally.

Furthermore, professional development for educators should explicitly emphasise autonomy-supportive practices, equipping educators to foster student independence while maintaining necessary structure. This includes incorporating student perspectives into school belonging initiatives, which has been shown to strengthen engagement and relational connection (Allen et al., 2024). Evidence suggests that autonomy-supportive teaching is malleable and can be taught through modelling and practice (Reeve & Cheon, 2021). Thus, professional learning programs should focus on minimising controlling behaviours and encouraging student-centred approaches, embedded within evaluation frameworks to reinforce the importance of autonomy support. Rigid curriculums however, especially in secondary schools where exam content dominates, limit opportunities for student-led exploration and autonomy-supportive teaching (Deci & Ryan, 2016). To promote healthier psychological outcomes, policy frameworks must integrate student experiences of independence and emotional development alongside academic goals. A shift toward a more flexible, psychologically supportive curriculum would allow students to pursue interests and engage in self-directed learning, valuing competencies beyond test scores. Leaders and policymakers must empower teachers by creating systems that allow pedagogical decision-making. Supporting teacher autonomy can enhance the effectiveness of autonomy-supportive teaching, ultimately benefiting students' emotional, psychological, and social development.

Autonomy support in secondary education must be delivered equitably. Socioeconomically disadvantaged students often face greater emotional and developmental pressures (Elsayed et al., 2023), making them particularly vulnerable to disengagement and distress. Autonomy-supportive teaching can act as a protective factor, helping buffer the effects of academic pressure and social adversity. This review reinforces autonomy as a universal psychological need, essential not only for students who are thriving but also for those who struggle. Tailored strategies, such as scaffolding choices for unmotivated learners and training teachers to minimise controlling behaviours, can help meet the needs of a wider range of students. Moreover, cross-cultural evidence from both this review and meta-analyses (Donald et al., 2021; Ryan et al., 2023) confirms the universality of autonomy. Although its expression may vary across cultures, its developmental significance remains consistent, underscoring the potential of autonomy-supportive practices to enhance adolescent wellbeing. This review adds to the growing body of research advocating for the implementation of autonomy support as a foundational pedagogical principle, supporting its inclusion in educational policies and practices to improve both wellbeing and academic outcomes for students.

2.5.7 Conclusion

In conclusion, both theoretical frameworks and empirical evidence highlight the central role of teacher autonomy support in fostering adolescents' emotional, psychological, and social wellbeing. This review demonstrates that the existing literature provides valuable insights, although the lack of experimental and intervention studies limits our ability to definitively establish causal relationships. Future research must prioritise experimental and longitudinal designs to better understand how autonomy support influences adolescents' development and emotional preparedness for adulthood. By elucidating the specific mechanisms through which teacher autonomy support enhances resilience, motivation, and social connectedness, future studies will not only contribute to a deeper understanding of adolescent wellbeing but also inform evidence-based interventions. Robust findings in this area have the potential to shape educational policies that emphasise autonomy support as a foundational element of teaching, promoting more equitable and holistic outcomes for all students in the classroom.

Chapter 3 Authenticity as a Pathway to Student Wellbeing and Autonomy-Frustration Coping: Examining Autonomy Support and Reactance in Secondary Education.

3.1 Abstract

Self-Determination Theory posits that autonomy-supportive environments enhance wellbeing and intrinsic motivation by satisfying basic psychological needs. Conversely, autonomy frustration can trigger psychological reactance, resistance to perceived threats to freedom, often expressed as defiance. This study examines whether authenticity, conceptualised using the 'State-Authenticity-as-Fit-to-Environment' model (SAFE; Self-concept fit, Goal fit, and Social fit), mediates the relationship between perceived teacher autonomy support and both student wellbeing and constructive coping responses to autonomy frustration. I also hypothesised that trait reactance, an individual's tendency to resist external control, moderates these relationships, with highly reactant students benefiting more from autonomy support.

In Study 1, 186 students aged 16–18 completed questionnaires assessing perceived autonomy support, authenticity, wellbeing, behavioural intentions, and trait reactance. Students who perceived greater autonomy support reported higher wellbeing, greater authenticity (especially social fit), and lower defiance. Authenticity significantly mediated the link between autonomy support and wellbeing, even when controlling for other support types.

Study 2 replicated the design with a larger sample to adequate power the moderation analysis. 549 participants aged 18–22 completed the same measures reflecting on their secondary school experiences. Confirming results of Study 1, autonomy support was associated with reduced defiance, and with increased wellbeing. Authenticity mediated the relationship only in the case of wellbeing, through all three types of fit. Trait reactance did not moderate this relationship, and unexpectedly, high social fit was associated with increased defiance in students high in trait reactance. These findings highlight the importance of supporting autonomy and authenticity in educational settings to foster wellbeing and adaptive coping, with a need for further research to provide clarity to the role of trait reactance in these relationships.

3.2 Introduction

Adolescent wellbeing is essential for healthy emotional, social, and cognitive development. It shapes individuals' ability to function effectively in school and sets the foundation for thriving in adulthood. Schools are not only places of academic learning but also key environments for psychological development. When educational settings support students' emotional needs, they contribute to greater engagement and achievement in the short term and help build a more resilient and emotionally balanced generation over time. However, rising rates of anxiety, depression, and stress among adolescents (Racine et al., 2021) highlight the urgent need to address their mental health. Contributing factors include academic pressure, increased use of social media, and broader societal uncertainties such as climate change and economic instability (Kelly et al., 2019; Twenge et al., 2018). These challenges call for renewed attention to the ways in which schools can foster environments that support students' psychological wellbeing. One area of growing interest is how the degree of autonomy students experience in the classroom may influence their emotional health and ability to manage frustration. Support for student autonomy has the potential to buffer against stressors by fostering a stronger sense of self and more adaptive coping strategies. The purpose of this work is to examine how autonomy-supportive teaching contributes to adolescent wellbeing and the ways students respond to autonomy frustration. The overarching goal is to explore how feelings of authenticity and individual differences in psychological reactance shape these effects, with the aim of informing educational practices that support emotional development and resilience.

3.2.1 Autonomy in Education

Autonomy plays a key role in supporting the development of wellbeing by empowering individuals to make choices that align with their values, interests, and goals (Deci & Ryan, 1987). Rooted in Self-Determination Theory, autonomy supports greater self-determination, which in turn fosters intrinsic motivation and engagement. Autonomy, understood within this framework as volitional functioning, is particularly important during adolescence, a period marked by identity formation and increasing independence (Beyers et al., 2024). It is considered a fundamental driver of wellbeing due to the *organising principle*, whereby individuals actively engage with the environment in a structured way to elaborate and extend their internal schema and self-representations in a coherent, adaptive manner (Deci & Ryan, 1985).

Environments that support autonomy encourage volitional exploration and decision-making, promoting the development of competence across social and independent functioning. Autonomy-supportive teaching involves taking the student's perspective, providing explanations, acknowledging negative affect, using non-pressuring language and displaying patience (Reeve et al., 1999). Such support allows students to act in self-determined ways, whereas those that neglect and frustrate these

needs constitute controlling environments (Deci & Ryan, 1987; Reeve et al., 1999). Students who perceive their teachers to be autonomy-supportive may benefit in a range of ways, such as higher levels of self-determination (Vallerand et al., 1997), academic engagement (Flunger et al., 2019) and vitality (Nunez et al., 2015). While autonomy-supportive teaching can promote wellbeing for many students, responses to autonomy vary, especially when individuals perceive threats to their sense of freedom.

3.2.2 Reactance

When individuals perceive their freedom to be threatened, they experience a motivational state aimed at restoring autonomy. This response to autonomy threat is referred to as psychological reactance (Brehm, 1966; Rosenberg & Siegel, 2018; Steindl et al., 2015). This is thought to include cognitive and emotional elements, may manifest as resistance, defiance, or disengagement from the perceived source of control (Dillard & Shen, 2005). Individuals high in trait reactance, who are characterised by a generally heightened sensitivity to autonomy threats, are especially prone to such responses. Reactance has been widely studied in the context of health behaviour and persuasive communication. In health communication research, evidence shows highly reactant individuals push back against overly controlling messages by exhibiting rebellious behaviour and reduced motivation to comply (Quick & Stephenson, 2008). Research suggests that reactance can be reduced and cooperation increased, by using autonomy-supportive language, providing meaningful choices, and avoiding language that signals threat or control (Reynolds-Tylus, 2019). These strategies help preserve individuals' sense of agency and reduce defensive resistance to messages.

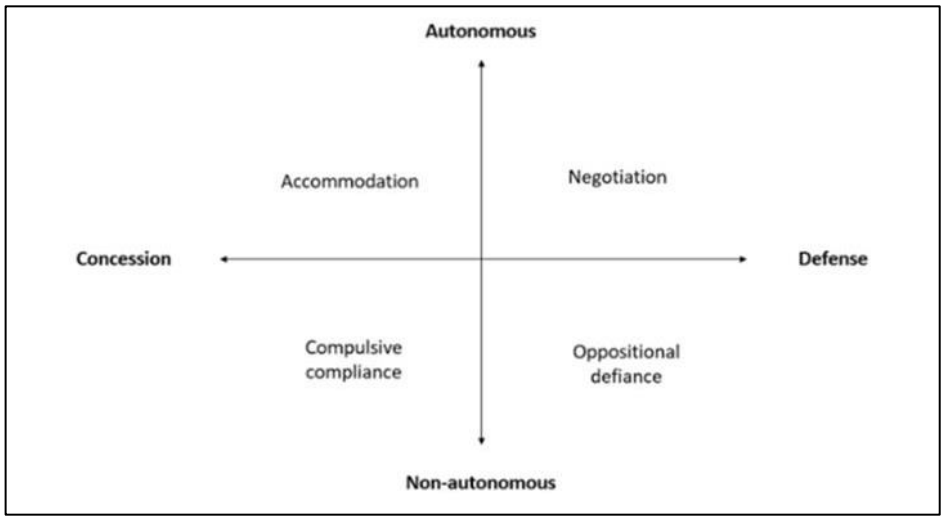
Psychological reactance is highly relevant in education, where the structured and demanding nature of school life can easily trigger autonomy-related resistance. Student autonomy is often constrained by rigid structures such as inflexible curricula, standardised routines, and top-down behavioural policies. Rules related to attendance, uniform, and conduct can create a sense of external control, limiting opportunities for adolescents to develop decision-making skills and self-regulation (Deci, 2009). These systemic constraints are typically enforced by authority figures, which may lead to interpersonal tensions, particularly when students perceive their autonomy as being undermined. Students high in reactance, linked to emotional instability, immature intentionality, and low self-awareness (Moreira et al., 2022) are likely to find school environments especially challenging, as their heightened sensitivity to perceived threats to autonomy makes them more likely to resist imposed expectations. This may result in disengagement, oppositional behaviours, or a rejection of school values and authority, patterns likely to negatively affect academic motivation and longer-term outcomes. Recognising and addressing these dynamics is therefore crucial in creating supportive learning environments that accommodate individual differences in autonomy needs.

The convergence between psychological reactance research and Reeve's (2006) framework for autonomy-supportive teaching underscores the importance of student agency to promote engagement and reduce resistance. Reactance research emphasises that individuals are more likely to accept messages when their freedom is acknowledged, choices are offered, and controlling language is avoided. Similarly, Reeve identifies key autonomy-supportive strategies, including taking the student's perspective, providing rationale for tasks, offering choice within structure, and acknowledging negative emotions. Whether in health communication or the classroom, the core principle remains the same: individuals are more likely to internalise messages and engage meaningfully when they feel their autonomy is respected. Educational approaches can therefore, benefit from the application of insights from psychological reactance theory, using autonomy-supportive practices to enhance motivation and reduce oppositional behaviour. Understanding these dynamics is particularly important when students experience autonomy frustration, a state that can trigger a range of coping responses depending on how individuals perceive and manage the loss of volitional control.

3.2.3 Behavioural Coping Responses to Autonomy Frustration

Autonomy-frustration specifically refers to experiences where a person feels controlled, coerced, or constrained, preventing them from acting in line with their own values or interests. To understand how people respond when their autonomy is frustrated, Skinner and Edge (2002) proposed a taxonomy based on two key dimensions: concession vs. defence and autonomous vs. controlled (Figure 3.1). The first dimension distinguishes whether a person confronts the issue (defence) or retreats from it (avoidance), while the second distinguishes whether their coping style is self-directed (autonomous) or driven by external pressure (controlled). Combining these dimensions, Skinner and Edge identified four coping styles. The first is accommodation, where individuals adapt to external demands while staying true to their values. The second is defiance, where individuals resist control through rebellion or oppositional behaviour. The third is negotiation, which involves stepping back to reflect and regain agency. The fourth is submission, which represents passive compliance with external demands, often to avoid conflict. Skinner and Edge (2002) explain that autonomous responses tend to promote better psychological outcomes and more sustainable motivation over time. In contrast, controlling coping strategies such as submission may offer short-term relief but often undermine longer-term wellbeing (see Appendix B1 for the original version of the taxonomy).

Figure 3.1 *Taxonomy of Coping with Autonomy Frustration* (Skinner & Edge, 2002, adapted by Flamant et al., 2023).



Research has demonstrated the effectiveness of autonomy-supportive attempts to regulate adolescent behaviour in parents (e.g., Grolnick & Pomerantz, 2009; Soenens et al., 2017). The study by Van Petegem et al. (2015) demonstrates that perceived controlling behaviour from parents is positively associated with oppositional defiance and submissive compliance in adolescents, while negatively related to negotiation and accommodation. This means that when adolescents perceive their parents as controlling, they are more likely to either rebel outright or comply in a superficial, non-volitional way, rather than engaging in open dialogue or genuinely cooperating. These patterns arise because controlling parenting frustrates adolescents' basic need for autonomy, leading to psychological reactance. As a result, instead of supporting mutual understanding or adaptive coping, perceived control triggers resistance or passive acquiescence, both of which are linked to poorer behavioural and emotional outcomes. These dynamics may also extend beyond the home, suggesting that similar patterns could emerge in schools, where controlling teaching practices may likewise undermine student engagement and promote defiance or disengagement in the student-teacher relationship.

3.2.4 The Role of Authenticity

. Experiencing greater self-determination and autonomy is thought to promote authenticity, as choices are guided by internal motivations rather than external pressures (Lenton et al., 2013). A sense of authenticity is the feeling of being true to oneself (Schlegel et al., 2009) arises from a sense of alignment between one's actions and core values, beliefs, and identity. This congruence between self-perception and behaviour strengthens a sense of agency, enabling individuals to navigate life with greater confidence and emotional stability. Over time, autonomous engagement supports the development of a coherent sense of identity (Ryan, 1995), as individuals come to understand who they

are and what matters to them. This evolving self-knowledge underpins feelings of authenticity and provides a foundation for psychological wellbeing (Sutton, 2020).

Schmader and Sedikides (2018) developed the State-Authenticity-as-Fit-to-Environment (SAFE) model, a framework explaining how social identities influence the situations people approach or avoid based on feelings of authenticity. The model identifies three types of person-environment 'fit' (i.e., self-concept fit, goal fit, and social fit) that support cognitive, motivational, and social fluency, thereby promoting state authenticity. The model emphasises that authenticity is not only about being true to oneself but also about perceiving one's identity as fitting well within a particular environment (Aday & Schmader, 2019), highlighting how authenticity emerges from the interaction between personal self-perceptions and external support. A recent scoping review highlights the breadth of research regarding authenticity in adolescence (Alchin et al., 2023) and there is growing evidence that authenticity is a key mechanism of wellbeing for adolescents. Thomaes et al. (2017) found that authenticity significantly enhances adolescents' subjective wellbeing, primarily as a result of autonomy experiences, while also being linked to relatedness and competence, and serving as a mediator between psychological need satisfaction and wellbeing. Authenticity is increasingly recognised as a dynamic and socially influenced process that plays a central role in adolescent wellbeing depending on the alignment of their environment with their psychological needs.

3.2.5 Current Research

When students experience high levels of autonomy frustration in school, they may begin to feel inauthentic, as their actions no longer reflect their internal values. This erosion of authenticity can diminish their sense of fit within the school environment. For some students, particularly those higher in trait reactance, this dissonance may trigger defiance as a coping response. Although defiance may offer a temporary sense of agency, it often leads to conflict with teachers and peers, reinforcing patterns of miscommunication and resistance. In turn, this cycle would further undermine sense of belonging and engagement and longer-term wellbeing. Autonomy-supportive teaching may help interrupt this cycle. By encouraging volitional action and reducing the likelihood of reactance, it can facilitate authenticity in students, even in the face of necessary constraints. When students feel that their autonomy is respected, they are more likely to perceive themselves as acting in line with their values, which promotes adaptive coping and psychological wellbeing. This may be especially important for adolescents who are more sensitive to perceived threats to their freedom due to high trait reactance.

The current study addresses a gap in the literature by empirically examining how perceptions of autonomy support influence students' experiences of authenticity, trait reactance, and coping responses to autonomy frustration. Specifically, I test whether authenticity mediates the relationship

between autonomy-supportive teaching and wellbeing, and whether trait reactance moderates the link between autonomy frustration and coping behaviour. By clarifying these mechanisms, this research aims to inform educational practices that foster resilient, emotionally supportive learning environments and promote students' social-emotional development.

3.2.6 Hypotheses

Based on the literature reviewed, I developed three hypotheses to guide our investigation into how autonomy-supportive teaching influences student wellbeing and coping. These hypotheses test key theoretical assumptions, with a particular focus on the mediating role of authenticity and the moderating role of trait levels of reactance.

Hypothesis 1: Students who report greater exposure to autonomy-supportive teaching will show higher wellbeing and greater use of adaptive coping strategies (i.e., accommodation, negotiation) instead of maladaptive strategies (i.e., defiance, submission).

Hypothesis 2: The association between autonomy supportive teaching and both coping behaviours and wellbeing, will be mediated by authenticity.

Hypothesis 3: The mediated effect in Hypothesis 2 will be moderated by trait reactance, such that the pathway from autonomy support to greater wellbeing and reduced defiance via authenticity will be stronger for students high in reactance.

3.3 Study 1

3.3.1 Introduction

This study used a correlational design with a student sample to explore how autonomy-supportive teaching relates to wellbeing and autonomy-frustration coping during adolescence, a period marked by increasing need for autonomy and identity development. I chose to study students aged 16–18 as they are actively navigating academic and social pressures, making them a relevant group for examining coping behaviours and psychological outcomes. A correlational design allowed for the examination of naturally occurring variations in perceived autonomy support and their associations with individual differences in authenticity and trait reactance. By focusing on this age group within real-world school environments, the study aimed to enhance ecological validity while contributing to our understanding of the mechanisms linking teaching style to student wellbeing.

3.3.2 Method

3.3.2.1 Sample and Recruitment

Participants were recruited from two schools in south-east England, referred to as Setting A and Setting B. Setting A was a sixth form provision within a secondary school; Setting B was a further education setting. Inclusion criteria required participants to be currently enrolled in secondary education and be aged between 16-18. While participants were aged 16-18 and therefore enrolled in post-16 or further education, this phase is still structurally connected to secondary education in England, as it typically represents Years 12 and 13 within the same institutional framework (e.g., sixth forms attached to secondary schools). The curriculum, teaching style, and classroom dynamics in these settings often closely resemble those of earlier secondary education, particularly in academic subjects. Recruiting from this age group was also more feasible due to ethical considerations, as students aged 16 and over can provide informed consent without parental involvement which facilitated data collection while maintaining alignment with the pedagogical context of secondary education.

Recruitment was conducted through school announcements and all students were invited to participate. Teachers helped distribute study information, which advertised a study regarding students' attitudes, wellbeing, and behaviour (see Appendix B3 for Participant Information Sheet). Participants were provided with details about the study's purpose, voluntary participation, and confidentiality assurances before completing survey measures. Data collection took place over two weeks during school hours at a time convenient for participants by using a link to access the study on the Qualtrics platform on a school computer/laptop.

3.3.2.2 Participants

The final sample consisted of 186 students. While 234 students accessed the study hyperlink, 50 participants did not fully complete any measures and were removed from analysis. Participants were recruited from Years 11–13 (ages 16–18), with Year 12 students representing the largest portion of the sample (60.1%), followed by Year 13 (40.4%), and one participant from Year 11. The demographic profile indicates a predominantly female sample (60.8%), with males comprising 33.1% and a small but notable proportion identifying as non-binary or third gender (5.0%). The majority of participants identified as White (75.5%), with other ethnic groups represented in smaller numbers. Due to missing demographic responses, totals vary slightly by category. Full demographic information by setting is provided in Table 3.1.

Table 3.1 *Characteristics of Total Sample by Setting*

	Sixth Form		**College**		**Total**	
Characteristics	N	%	N	%	N	%
Gender						

Male	29	29.0	31	38.3	60	33.1
Female	65	65.0	43	53.1	110	59.7
Non-binary/Third Gender	3	3.0	0	0.0	9	5.0
Prefer not to say/self-describe	3	3.0	1	1.2	4	2.3
Total	100		81		181	
Ethnicity						
White	75	74.3	64	77.1	139	75.5
Black	3	3.0	5	6.0	8	4.3
Asian	9	8.9	0	0.0	9	4.9
Mixed	11	10.9	11	13.3	22	12.0
Other	2	2.0	2	2.4	4	2.2
Prefer not to say	1	1.0	1	1.2	2	1.1
Total	101		83		184	
Year Group						
11 (age 15-16)	0	0	1	1.3	1	0.6
12 (age 16-17)	59	60.2	46	57.5	107	59.0
13 (age 17-18)	39	39.8	33	41.3	72	40.4
Total	98		80		178	

3.3.2.3 Measures

3.3.2.3.1 Perceptions of Autonomy Support at School

The Learning Climate Questionnaire (LCQ) was used to assess the level of autonomy support perceived by students in their educational environment (Williams & Deci, 1996; $M = 3.65$, $SD = 1.86$, $\alpha = 0.96$). I used the 15-item version of the LCQ; our predictor variable of interest was autonomy support (1 = strongly disagree, 5 = strongly agree; $M = 3.45$, $SD = 0.82$, $\alpha = 0.93$), and I included competence support and relatedness support as covariates in our mediation analysis. The autonomy subscale includes 15 items (e.g., “I feel that my teachers provide me with choices and options” and “My teachers listen to how I would like to do things”). The competence subscale includes 4 items (e.g., “The teachers make me feel like I can do well”) and the relatedness subscale includes 5 items (e.g., “The teachers are interested in me”). Grounded in Self-Determination Theory, this measure has been validated across various educational contexts (e.g., Bean et al., 2019).

3.3.2.3.2 Trait Reactance

I used The Hong Psychological Reactance Scale (HPRS) to assess dispositional reactance which has been validated in an adolescent sample (Hong & Faedda, 1996; Moreira et al., 2020). This scale includes 14 items, such as, “I find contradicting others stimulating” and “When someone gives me advice, this usually makes me do just the opposite” (1 = strongly disagree, 5 = strongly agree; $M = 3.01$, $SD = 0.80$, $\alpha = 0.93$).

3.3.2.3.3 State Authenticity

To measure students' sense of authenticity in school, I used The State Authenticity as Fit to Environment (SAFE) Scale (Aday et al., 2024). There are 15 items scored 1 = strongly disagree, 5 = strongly agree. There are 5 items per sub-scale which were each written to refer to a school setting: self-concept fit (e.g., "School feels right for who I am"; $M = 3.26$, $SD = 1.00$, $\alpha = 0.93$); goal fit (e.g., "Classes at school are designed in a way that fits how I like to learn"; $M = 3.35$, $SD = 1.01$, $\alpha = 0.93$); social fit (e.g., "I feel that people at school understand exactly who I am"; $M = 3.31$, $SD = 0.93$, $\alpha = 0.89$).

3.3.2.3.4 Wellbeing

I used the Brief Inventory of Thriving (BIT) to assess students' overall psychological wellbeing (Su et al., 2014). It is a unidimensional measure which has been recently validated in an adolescent population (Syed et al., 2024). This measure evaluates key dimensions of wellbeing, including emotional, social, and life satisfaction components. This scale has 10 items such as, "I feel good most of the time" and "I am achieving most of my goals" (1 = strongly disagree, 5 = strongly agree; $M = 3.73$, $SD = 0.72$, $\alpha = 0.90$).

3.3.2.3.5 Behavioural Response to Autonomy-Frustration

I used the Anticipated Behavioural Intentions in Response to Rules questionnaire developed by Van Petegem et al. (2017), which integrates previously validated subscales to measure adolescents' responses when asked to do something by a teacher that they disagree with. The questionnaire begins with the stem, "When my teacher asks me to do something I don't agree with, I…" and includes 22 items rated on a 5-point scale (1 = strongly disagree, 5 = strongly agree), covering four types of responses: defiance (4 items, adapted from Vansteenkiste et al., 2014; e.g., "I would simply disregard the rules"; $M = 2.64$, $SD = 1.14$, $\alpha = .93$), submission (7 items, adapted from Zimmer-Gembeck & Skinner, 2016; e.g., "I would do what is asked strongly against my will"; $M = 2.90$, $SD = 0.88$, $\alpha = .88$), negotiation (5 items, adapted from Chen et al., 2016; e.g., "I would try to reach an agreement that is good for both parties"; $M = 3.66$, $SD = 0.76$, $\alpha = .89$), and accommodation (6 items, adapted from the Responses to Stress Questionnaire; e.g., "I would try to understand that these rules are actually well-meant"; $M = 3.80$, $SD = 0.60$, $\alpha = .75$). While defiance and submission scales were used by Van Petegem et al. without major modification, the negotiation and accommodation subscales were adapted to better fit the school context. All subscales demonstrated acceptable to excellent internal consistency.

3.3.2.3.6 Demographics

At the end of our survey, I asked participants to complete several multiple-choice questions to collect demographic information. I included questions about their school year group, which served as a proxy for age, as well as their school setting, gender, and ethnicity. I used this approach to understand the background of our participants and to ensure that our findings could be interpreted with this additional context.

3.3.2.3.7 Achievement and Absenteeism

In addition to the demographic questions, I also included two items related to absenteeism and academic achievement. I asked participants how many days they had been absent from school so far this year to gain insight into their attendance patterns. I also asked them to rate how well they felt they were doing in their studies, which provided a self-reported measure of their academic performance. Given the non-randomised sampling method, these questions were designed to help us to further understand the contextual characteristics of the sample.

3.3.2.4 Procedure

I conducted the study online, enabling students to complete the survey in a familiar school environment. After obtaining ethical approval and school permissions, I invited participants to take part during a designated tutor time and laptops owned by the schools were made available for use to complete the study. Students were encouraged to use the laptops rather than their phones. School staff supported the process by providing students with a secure Qualtrics link to access the survey. At the start, students viewed an online information sheet (see Appendix B3 for Participant Information Sheet example) and consent form that explained the study's purpose, voluntary nature, and confidentiality measures. I asked students to confirm that they were over 16 years old to ensure they could legally provide their own consent, in line with the agreement schools made to distribute the survey only to those aged 16 and over. I also provided schools with an information sheet to share with parents, promoting transparency and awareness of the research. Students who consented completed the survey, which included demographic questions and five measures, which took approximately 15 minutes. Once finished, they were shown a debriefing statement summarising the study aims and offered contact details for the lead researcher for further information or to withdraw their data.

3.3.3 Study 1 Results

3.3.3.1 Descriptives

Normality was assessed via visual inspection of histograms and Q-Q plots, which indicated approximate normality for all variables. Multivariate outliers were evaluated using Mahalanobis distance based on the 12 subscale variables included in the primary analyses. A critical chi-square value of 32.91 ($df = 12$, $p < .001$) was used to identify potential outliers; 5 cases exceeded this threshold, ranging from 33.17 to 41.79. These cases were examined individually and did not show patterns of careless responding (e.g., repeatedly selecting the same response option). Mediation and moderated mediation analyses were conducted using the PROCESS macro (Hayes, 2017) with bootstrapped estimates, which are robust to violations of normality and the presence of a small number of outliers.

Students in sixth form generally reported perceiving themselves as more engaged and successful in their education, with stronger intentions to remain in school (see Table 3.2). Sixth Form students reported better attendance, with 25% missing no days compared to only 8% of college students, while over half of college students (52%) reported missing more than five days, compared to just 25% in sixth form. A greater proportion of sixth form students (41%) rated themselves as achieving "very well" or "extremely well," whereas only 31% of college students reported at these higher levels. When asked about their likelihood of completing their studies, 84% of sixth form students expressed confidence they would, compared to 74% of those in college. Due to small sample size, I did not include setting as a factor in the statistical analyses but have included the self-reported results for absenteeism, achievement and intention to complete studies for descriptive purposes.

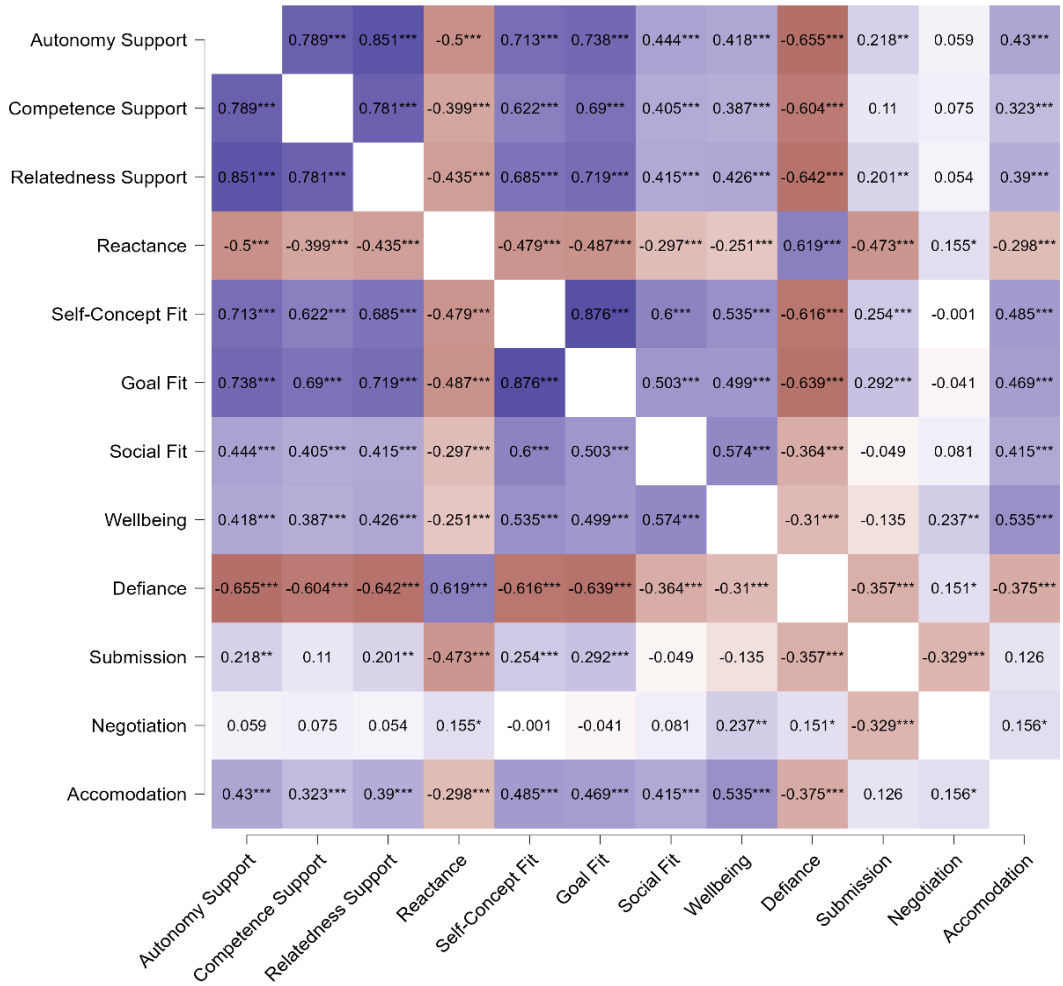
Table 3.2 *Comparison of Educational Indicators Between Settings*

	Sixth Form		**College**		**Total**	
	N	%	N	%	N	%
Absenteeism						
0 days	25	24.8	7	8.4	32	17.4
1-5 days	51	50.5	33	39.8	84	45.7
5-10 days	16	15.8	23	27.7	39	21.2
10-20 days	5	5.0	14	16.9	19	10.3
>20 days	4	4.0	6	7.2	10	5.4
Total	101		83		184	
Achievement						
Not well	1	1.0	5	6.0	6	3
Slightly well	19	18.8	15	18.1	34	19
Moderately well	40	39.6	37	44.6	77	42
Very well	36	35.6	24	28.9	60	33
Extremely well	5	5.0	2	2.4	7	4
Total	101		83		184	
Study completion						
Yes	84	83.2	61	73.5	145	78.8
No/Not sure	17	16.8	22	26.5	39	21.2
Total	101		83		184	

3.3.3.2 Hypothesis 1: Bivariate Correlations

Bivariate correlations are reported in Table 3.3. Testing Hypothesis 1, autonomy support was positively associated with wellbeing and all three dimensions of authenticity: self-concept fit, goal fit, and social fit. It was also positively related to accommodation and submission, while negatively associated with defiance. Autonomy support showed no significant relationship with negotiation. As expected, trait reactance was negatively associated with authenticity, wellbeing, submission, and accommodation, and positively associated with defiance and, to a lesser extent, negotiation.

Table 3.3 *Study 1 Bivariate Correlations Heatmap*



Note: *$p < .05$. **$p < .01$, ***$p < .001$

3.3.3.3 Hypothesis 2: Mediation Analyses

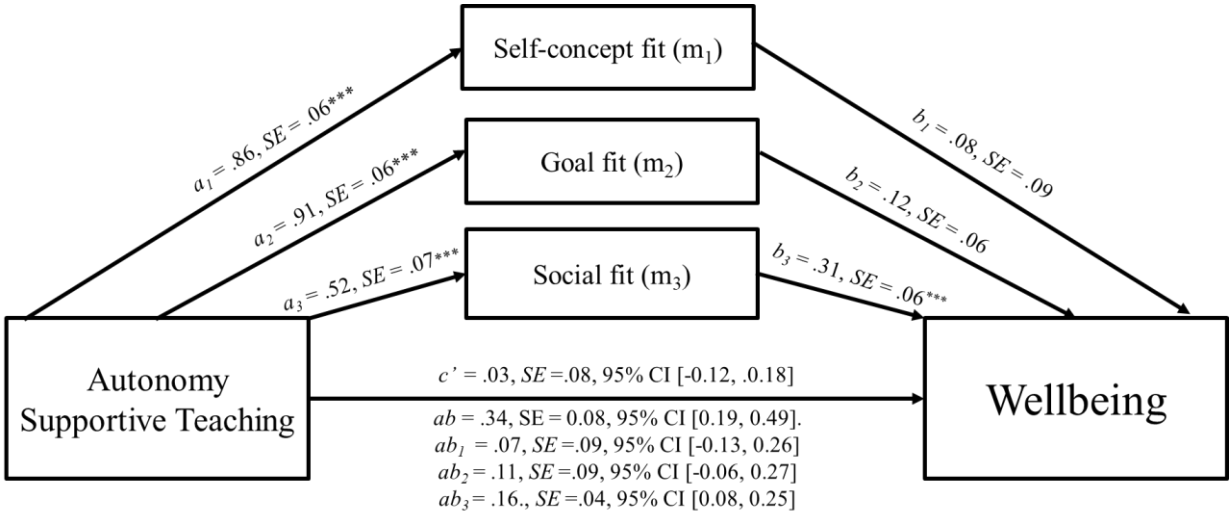
3.3.3.3.1 Wellbeing

To examine whether authenticity mediated the association between perceptions of autonomy-supportive teaching and student wellbeing, I conducted a multiple mediation analysis using Model 4 of the PROCESS macro (Hayes, 2017), with the three types of authenticity, self-concept fit, goal fit, and social fit, entered simultaneously as mediators (see Figure 3.2). Autonomy support significantly predicted greater wellbeing, representing a positive total effect ($B = 0.37$, $SE = 0.05$, $t = 6.27$, $p < .001$, 95% CI [0.25, 0.48]). In line with expectations, autonomy support was also positively associated with all three dimensions of authenticity: self-concept fit ($B = 0.86$, $SE = 0.06$, $t = 13.90$, $p < .001$, 95% CI [0.75, 0.99]), goal fit ($B = 0.91$, $SE = 0.06$, $t = 14.84$, $p < .001$, 95% CI [0.79, 1.04]), and social fit ($B = 0.52$, $SE = 0.07$, $t = 7.07$, $p < .001$, 95% CI [0.38, 0.67]).

When all three mediators were entered simultaneously, only social fit was significantly associated with wellbeing ($B = 0.31$, $SE = 0.06$, $t = 5.56$, $p < .001$, 95% CI [0.20, 0.43]). Neither self-concept fit ($B = 0.08$, $SE = 0.09$, $t = 0.83$, $p = .406$, 95% CI [–0.11, 0.27]) nor goal fit ($B = 0.12$, $SE = 0.06$, $t = 1.27$, $p = .204$, 95% CI [–0.06, 0.29]) were significantly related to wellbeing in this model. The total indirect effect of autonomy support on wellbeing through the combined set of authenticity dimensions was significant ($B = 0.34$, $SE = 0.08$, 95% CI [0.19, 0.49]). Among the individual mediators, the indirect effect through social fit was significant ($ab_3 = 0.16$, $SE = 0.04$, 95% CI [0.08, 0.25]), while indirect effects through self-concept fit ($ab_1 = 0.07$, $SE = 0.09$, 95% CI [–0.13, 0.26]) and goal fit ($ab_2 = 0.11$, $SE = 0.09$, 95% CI [–0.06, 0.27]) were not.

To assess whether the observed mediation effects were robust to additional forms of teaching support, competence support and relatedness support were added to the model as covariates. The inclusion of these variables slightly attenuated the strength of some effects but did not change the overall pattern of findings. Autonomy support continued to significantly predict all three dimensions of authenticity, and social fit remained the only authenticity dimension significantly associated with wellbeing. The total indirect effect also remained statistically significant, suggesting that the mediation pathway through social fit was not dependent on the exclusion of related teaching dimensions (see Supplementary Materials for the covariate-adjusted analysis).

Figure 3.2 *Simple Mediation Model: Direct and Indirect Effects of Autonomy Support on Wellbeing via Authenticity Types*



Total effect: $B = 0.37$, $SE = 0.05$, $t = 6.27$, $p < .001$, 95% CI [0.25, 0.48]. Parameter estimates are unstandardized. Significance: $*p < .05$; $**p < .01$; $***p < .001$.

3.3.3.3.2 Autonomy-Frustration Coping Responses

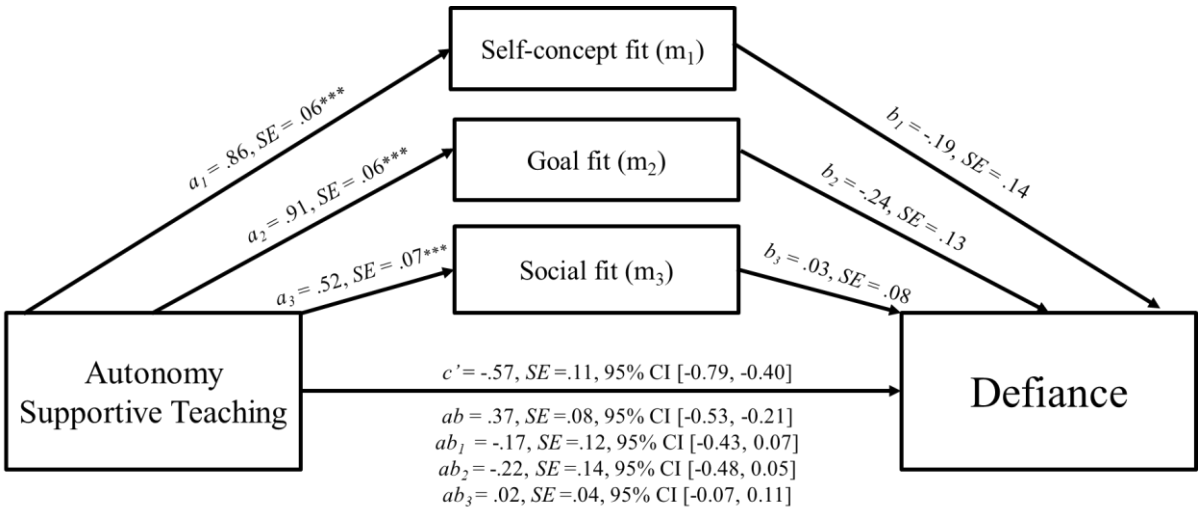
A second mediation model was estimated using defiance as the outcome variable (see Figure 3.3). Autonomy support was significantly associated with lower levels of defiance, reflecting a strong negative total effect ($B = –0.93$, $SE = 0.08$, $t = –12.01$, $p < .001$, 95% CI [–1.09, –0.78]). As in the wellbeing model, autonomy support significantly predicted higher levels of self-concept fit, goal fit, and social fit (the *a* paths).

When all three authenticity dimensions were entered into the model simultaneously, none were significantly related to defiance (the *b* paths). Self-concept fit was negatively but not significantly associated with defiance ($B = –0.19$, $SE = 0.14$, $t = –1.38$, $p = .169$, 95% CI [–0.47, 0.08]), and goal fit showed a similar pattern ($B = –0.24$, $SE = 0.13$, $t = –1.80$, $p = .073$, 95% CI [–0.49, 0.02]). Social fit was not associated with defiance in this model ($B = 0.03$, $SE = 0.08$, $t = 0.41$, $p = .685$, 95% CI [–0.12, 0.19]). Despite the lack of significant individual pathways, the overall indirect effect of autonomy support on defiance through the combined set of authenticity dimensions was significant ($B = –0.37$, $SE = 0.08$, 95% CI [–0.53, –0.21]). None of the specific indirect effects via self-concept fit ($ab_1 = –0.17$, $SE = 0.12$, 95% CI [–0.43, 0.07]), goal fit ($ab_2 = –0.22$, $SE = 0.14$, 95% CI [–0.48, 0.06]), or social fit ($ab_3 = 0.02$, $SE = 0.04$, 95% CI [–0.06, 0.12]) were statistically significant.

When competence and relatedness support were added as covariates, the direct effect of autonomy support on defiance and the *a* paths to authenticity were somewhat reduced, and confidence

intervals widened slightly. However, the total indirect effect remained significant, indicating that the indirect association between autonomy support and defiance through authenticity was robust to the inclusion of these covariates.

Figure 3.3 *Simple Mediation Model: Direct and Indirect Effects of Autonomy Support on Defiance via Authenticity Types*



Total effect/c path: $B = 0.93$, $SE = 0.08$, $t = -12.01$, $p = < .001$, 95% CI [-1.09, -0.78]. Parameter estimates are unstandardized. Significance: *$p < .05$; **$p < .01$; ***$p < .001$.

Further exploratory mediation analyses were conducted to examine the mediating role of authenticity on the three other behavioural coping responses to autonomy frustration. As well as reducing defiance, autonomy support also encouraged more positive coping in the form of accomodation (*c* path; $B = 0.31$, $SE = 0.05$, $p < .001$), meaning students were more willing to adapt and cooperate, with social fit playing a key mediating role (b_3 path: $B = 0.13$, $SE = 0.05$, $p = .015$). Autonomy support was also associated with increased submission (*c* path: $B = 0.24$, $SE = 0.08$, $p = .003$), reflecting a readiness to comply with rules or expectations. This effect was mediated by authenticity and there was a negative association between social fit and submission (b_3 path: = -0.16 $SE = 0.05$, $p < .001$). This indicates that while autonomy support encourages submission, it also operates through social fit in a direction that actually reduces submissive behaviour. Full details of these analyses are reported in Appendix B4: Supplementary Analyses.

3.3.4 Study 1 Discussion

Although Study 1 provided promising support by linking autonomy-supportive teaching to wellbeing and more adaptive coping (reduced defiance, increased accommodation), as well as the mediating role of authenticity, it was limited by a relatively small sample size. With fewer than 200 participants, the study lacked sufficient power to detect mediation and moderated mediation effects

reliably, particularly when interaction terms are expected to be small to moderate. To address this limitation, I conducted a second study with a larger sample of emerging adults.

3.4 Study 2

3.4.1 Introduction

This follow-up study was designed to provide more robust estimates of indirect and moderated effects and to examine whether the observed patterns extend beyond current students to individuals reflecting on their past school experiences. I retained the same hypotheses, measures, and design as in Study 1, but expanded the sampling frame to include young adults aged 18–22 who had recently completed secondary education in the UK. This allowed us to assess the stability of the associations identified in adolescence and explore whether retrospective perceptions of autonomy-supportive teaching relate to wellbeing and coping in a larger sample.

3.4.2 Method

3.4.2.1 Sampling and Recruitment

I used a web-based tool to conduct a Monte Carlo Power Analysis for Indirect Effects (Schoemann et al., 2017). I used the correlations from Study 1 to inform the power analysis for this study. In Study 1, I observed moderate to large correlations between most study variables. I sought to achieve 80% power to detect small correlations (r = .20). Based on this, at least 317 participants were needed for the simple mediation analysis. Given a larger sample is required for moderated mediation analysis, I sought to recruit at least 500 participants which would also afford a sufficiently powered study while accounting for attrition.

Participants were recruited from the online Prolific platform. Inclusion criteria required participants to be aged 18-22, have attended secondary education in the United Kingdom from the ages of 14-16, and be fluent in English. Participants who completed the measures were paid £1.50 for their participation. Data collection took place over three days during May 2025. The dataset was highly complete and all participants who participated were included in the analysis.

3.4.2.2 Participants

The final sample consisted of 549 participants, all aged between 18-22. Regarding gender, 302 identified as female (55%), 231 identified as male (42.1%), 14 as non-binary or third gender (2.5%), and 2 preferred not to disclose. Regarding ethnicity, 333 participants identified as White (60.7%), 122

as Asian (22.2%), 49 as Black (8.9%), 33 as mixed (6%), 8 as Arab (1.5%) and 4 preferred not to disclose (0.7%).

3.4.2.3 Measures

I used the same measures as in Study 1, with all scales starting with a prompt for participants to reflect on their time in secondary education (e.g., Thinking back to when you were in school (aged 14-18), please reflect on the following questions). Items were written in past tense (e.g. I felt that teachers supported me to make choices in how I learnt). All scales demonstrated good reliability, autonomy support ($M = 3.30$, $SD = 0.82$, α .91), trait reactance ($M = 2.79$, $SD = 0.74$, α .89), self-concept fit ($M = 2.92$, $SD = 1.18$, α = .94), goal fit ($M = 3.26$, $SD = 1.00$, α = .87) social fit ($M = 2.79$, $SD = 1.12$, α = .92), wellbeing ($M = 3.45$, $SD = 0.97$, α = .93), defiance ($M = 3.87$, $SD = 0.95$, α = .88), submission ($M = 2.68$, $SD = 0.84$, α = .83), negotiation ($M = 3.04$, $SD = 1.13$, α = .93) accommodation ($M = 2.51$, $SD = 0.72$, α = .73).

3.4.2.4 Procedure

The study was conducted online on Qualtrics and pre-registered on AsPredicted (see Appendix B2). Participants were recruited via the Prolific platform and required to participate using a laptop, desktop or tablet but not a mobile phone. Participants were presented with an online information sheet and consent form, outlining the study's purpose, voluntary participation, and confidentiality measures. Prolific requires users to be over 18 and therefore able to give their own legal consent. An information sheet detailing the study was provided to participants who were required to acknowledge their consent before starting the survey. Upon completion, participants were presented with a debriefing statement and obtained a small payment in return for their completion of the study.

3.4.3 Study 2: Results

3.4.3.1 Descriptives

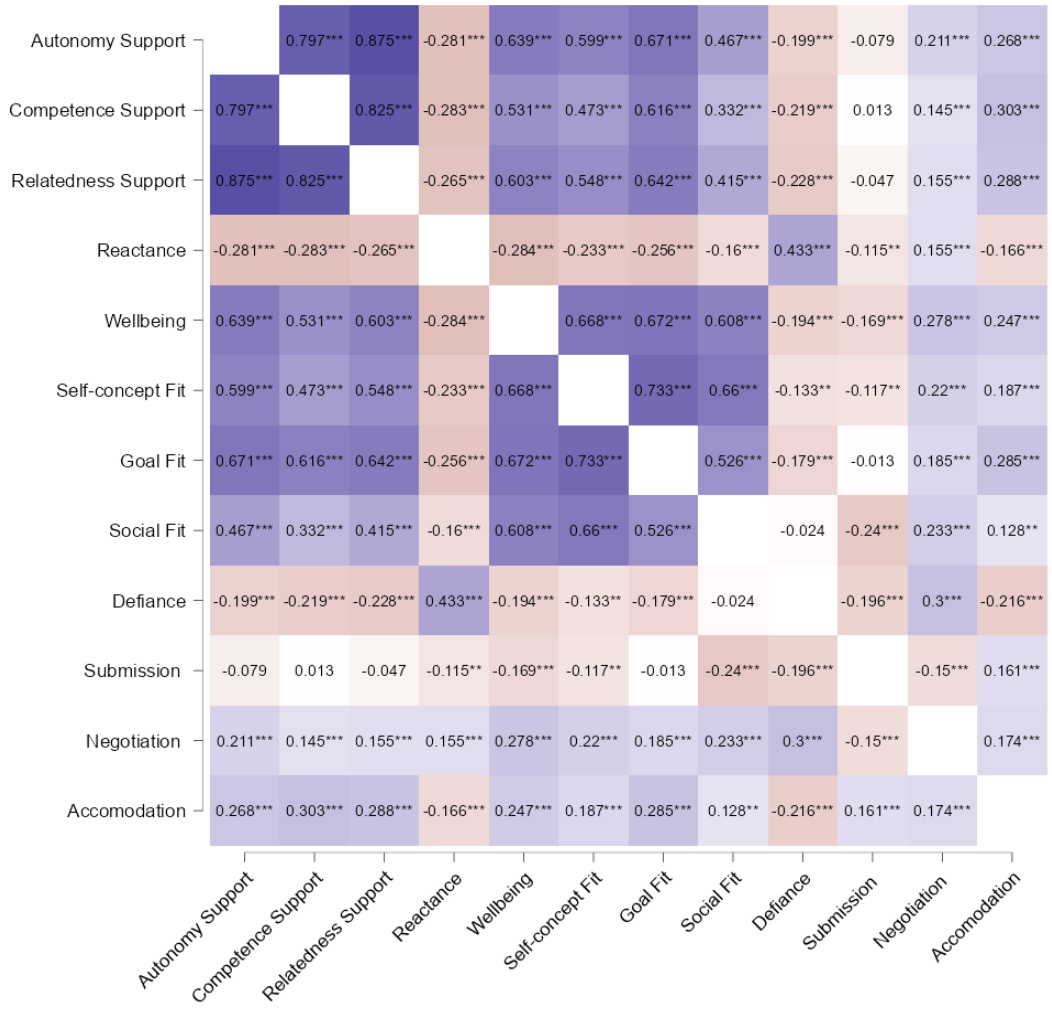
The dataset was highly complete, with no missing data across any variables. As in Study 1, normality was assessed via visual inspection of histograms and Q-Q plots, which indicated approximate normality for all variables. Multivariate outliers were evaluated using Mahalanobis distance based on the 12 continuous variables included in the primary analyses. A critical chi-square value of 32.91 ($df = 12$, $p < .001$) was used to identify potential outliers; nine cases exceeded this threshold ranging from 33.84 to 48.86. These cases were examined individually and did not show patterns of careless responding (e.g., repeatedly selecting the same response option). Mediation and moderated mediation analyses were conducted using the PROCESS macro (Hayes) with bootstrapped estimates, which are robust to violations of normality and the presence of a small number of outliers.

A large majority (96%) had completed their secondary education qualifications. Regarding absenteeism, almost half (49.5%) reported missing 1–5 days of school, while 19.5% missed 5–10 days, and 9.7% reported over 20 days of absence. In terms of achievement, 64.9% felt they were achieving ‘very well’ or ‘extremely well.’ Comparing the two samples, both showed relatively low rates of absenteeism, though long-term absence (>20 days) was nearly twice as high in Prolific participants compared with the current students in Study 1. Regarding academic achievement, Study 2 Prolific participants reported higher self-rated success and only 4% reported not completing their studies, compared to 21.2% reporting ‘No’ or ‘Not sure’ regarding their intention to complete their studies.

3.4.3.2 Hypothesis 1: Bivariate Correlations

As shown in Table 3.4, the results from Study 2 support Hypothesis 1 and generally replicate the patterns in Study 1. Autonomy support was positively associated with wellbeing, all facets of authenticity and accommodation, while negatively associated with defiance. In contrast to Study 1, autonomy support showed a positive association with negotiation and a negative association with submission, although the latter did not reach significance. Trait reactance again showed the expected negative correlations with wellbeing and authenticity, and was positively associated with defiance and negotiation, while negatively associated with submission and accommodation.

Table 3.4 *Study 2 Bivariate Correlations Heatmap*



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

Differences between the samples include weaker associations in the Prolific sample compared with the school student sample, for instance, between autonomy support and goal fit (r = .74 vs. .67), and between autonomy support and defiance (r = -.66 vs. -.19). The negative associations between trait reactance and authenticity were also more pronounced in the school sample, such as for self-concept fit (r = -.48 vs. -.23). Additionally, autonomy support was significantly positively associated with negotiation in Sample 2 (r = .21, p < .01), a relationship that was not observed in Sample 1. Overall, the patterns across the two samples were largely consistent, with autonomy support significantly positively associated with wellbeing, all three facets of authenticity (self-concept fit, goal fit, and social fit), and accommodation. Similarly, autonomy support was significantly negatively associated with trait reactance and defiance in both samples. Trait reactance was also negatively associated with wellbeing, authenticity, submission, and accommodation, and positively associated with defiance and negotiation in both samples.

3.4.3.3 Hypothesis 2: Mediation Analyses

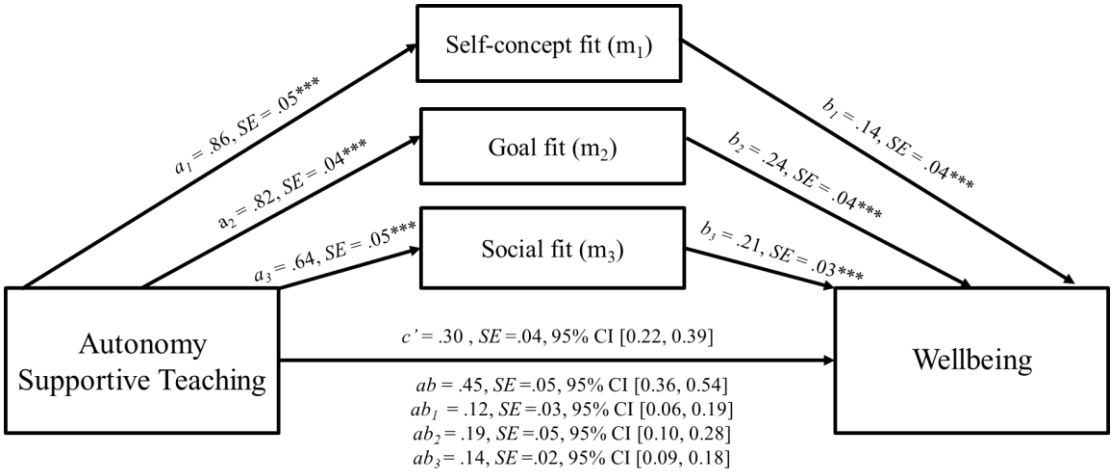
I conducted mediation analysis using Model 4 of the Process Macro (Hayes, 2017) to test our hypothesis that authenticity mediates the link between perceptions of autonomy supportive teaching and wellbeing, as well as autonomy-frustration behaviours.

3.4.3.3.1 Wellbeing

To assess whether authenticity mediated the association between autonomy-supportive teaching and student wellbeing, a multiple mediation model was estimated with self-concept fit, goal fit, and social fit entered simultaneously as mediators. Autonomy support was strongly associated with increased wellbeing, reflecting a significant total effect ($B = 0.75$, $SE = 0.04$, $t = 19.42$, $p < .001$, 95% CI [0.68, 0.83]). Autonomy support was associated with increased wellbeing (i.e., the total effect/*c* path), $B = 0.75$, $SE = 0.04$, $t = 19.42$, $p < .001$, 95% CI [0.68, 0.83]. Also, autonomy support was associated with higher authenticity (i.e., *a* paths). Specifically, autonomy support was associated with higher: self-concept fit (a_1 path: $B = 0.86$, $SE = 0.05$, $t = 17.51$, $p < .001$, 95% CI [0.77, 0.96]); goal fit (a_2 path: $B = 0.82$, $SE = 0.04$, $t = 21.14$, $p < .001$, 95% CI [0.74, 0.89]); and social fit (a_3 path: $B = 0.64$, $SE = 0.05$, $t = 12.35$, $p < .001$, 95% CI [0.54, 0.74]).

Each of the authenticity dimensions was also significantly associated with greater wellbeing when controlling for autonomy support (the *b* paths). Specifically, higher self-concept fit predicted higher wellbeing ($B = 0.14$, $SE = 0.04$, $t = 3.77$, $p < .001$, 95% CI [0.07, 0.22]), as did goal fit ($B = 0.24$, $SE = 0.04$, $t = 5.45$, $p < .001$, 95% CI [0.15, 0.32]) and social fit ($B = 0.21$, $SE = 0.03$, $t = 6.69$, $p < .001$, 95% CI [0.15, 0.27]). The overall indirect effect of autonomy support on wellbeing via authenticity was significant ($B = 0.45$, $SE = 0.05$, 95% CI [0.36, 0.54]), with each individual pathway contributing meaningfully. The indirect effect through self-concept fit was significant ($ab_1 = 0.12$, $SE = 0.03$, 95% CI [0.06, 0.19]), as was the effect through goal fit ($ab_2 = 0.19$, $SE = 0.05$, 95% CI [0.10, 0.28]) and through social fit ($ab_3 = 0.14$, $SE = 0.02$, 95% CI [0.09, 0.18]).

Figure 3.4 *Simple Mediation Model: Direct and Indirect Effects of Autonomy Support on Wellbeing via Authenticity Type*



Total effect/c path: $B = 0.75$, $SE = 0.04$, $t = 19.42$, $p = < .001$, 95% CI [0.68, 0.83]. Parameter estimates are unstandardized. *$p < .05$; **$p < .01$; ***$p < .001$.

3.4.3.3.1.1 Moderated Mediation Analyses: Wellbeing

Next, I conducted a moderated mediation analysis using Model 58 of the Process Macro (Hayes, 2017). with trait reactance included as a moderator. The *a* paths from autonomy support to each type of authenticity remained significant and were not moderated by reactance (all *Bs* < –0.06, *p*s > .30). Similarly, reactance did not moderate the b paths for self-concept fit or goal fit (all *Bs* < 0.05, *p*s > .48). However, reactance significantly moderated the path from social fit to wellbeing ($B = 0.09$, $SE = 0.05$, $t = 1.99$, $p = .048$, 95% CI [0.00, 0.18]). Social fit was significantly associated with greater wellbeing at low (-1 *SD*) levels of reactance ($B = .15$, $SE = 0.05$, $t = 3.10$, $p = .002$, 95% CI [0.05, 0.24]), mean levels of reactance ($B = .22$, $SE = 0.03$, $t = 7.05$, $p < .001$, 95% CI [0.16, 0.29]), and high (+1 *SD*) levels of reactance ($B = .29$, $SE = 0.05$, $t = 5.95$, $p < .001$, 95% CI [0.19, 0.38]). Thus, reactance seems to strengthen the association between social fit and wellbeing. Rather than high reactance weakening positive effects, the positive effect of social fit on wellbeing increases as reactance increases.

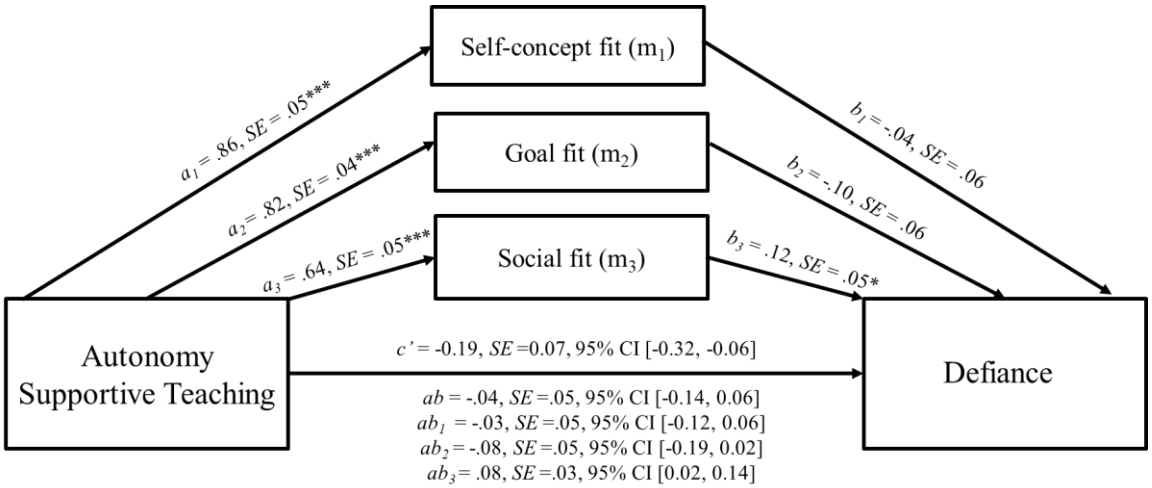
Examining conditional indirect effects, the mediation of autonomy support on wellbeing via social fit and goal fit was significant across all levels of reactance. For self-concept fit, the indirect effect was significant at low ($B = 0.15$, $SE = 0.07$, 95% CI [0.02, 0.29]) and moderate levels of reactance ($B = 0.12$, $SE = 0.03$, 95% CI [0.05, 0.19]), but not at high levels ($B = 0.09$, $SE = 0.05$, 95% CI [–0.02, 0.19]).

3.4.3.3.2 Autonomy-Frustration Coping Behaviour

To test whether authenticity mediated the association between perceived autonomy-supportive teaching and student defiance, I conducted mediation analyses using the three authenticity components (self-concept fit, goal fit, and social fit) as mediators. Autonomy support was significantly negatively associated with student defiance (*c* path: $B = -0.23$, $SE = 0.05$, $t = -4.76$, $p < .001$, 95% CI [-0.33, -0.14]), indicating that those perceiving greater autonomy support reported lower oppositional behaviour. As reported in the wellbeing analyses, autonomy support also positively predicted each *a* path. Of the *b* paths, only social fit was significantly associated with defiance ($B = 0.12$, $SE = 0.05$, $t = 2.54$, $p = .011$, 95% CI [0.03, 0.21]), such that students who felt more socially authentic reported greater defiance. Self-concept fit ($B = -0.04$, $SE = 0.06$, $p = .489$, 95% CI [-0.15, 0.07]) and goal fit ($B = -0.10$, $SE = 0.06$, $p = .109$, 95% CI [-0.23, 0.02]) showed non-significant, negative trends.

The total indirect effect of autonomy support on defiance through the three authenticity components was not significant ($ab = -0.04$, $SE = 0.05$, 95% CI [-0.14, 0.06]). However, the specific indirect effect via social fit was significant ($ab_3 = 0.08$, $SE = 0.03$, 95% CI [0.02, 0.14]). This indicates that autonomy-supportive teaching increased students' feelings of social authenticity, which in turn was linked to greater defiance. The indirect effects via self-concept fit ($ab_1 = -0.03$, $SE = 0.05$, 95% CI [-0.12, 0.06]) and goal fit ($ab_2 = -0.08$, $SE = 0.05$, 95% CI [-0.19, 0.02]) were not significant.

Figure 3.5 *Simple Mediation Model: Direct and Indirect Effects of Autonomy Support on Defiance via Authenticity Types*



Total effect: $B = -0.23$., $SE = 0.05$, $t = -4.76$, $p = < .001$, 95% CI [-0.33, -0.14]. Parameter estimates are unstandardized. *$p < .05$; **$p < .01$; ***$p < .001$

Additional mediation analyses, reported in the supplementary materials, examined submission, negotiation, and accommodation as coping outcomes. As in Study 1, autonomy support had a significant positive effect on accommodation (*c* path: $B = 0.23$, $SE = 0.04$, $p < .001$). This relationship was mediated specifically by goal fit (b_2 path: $B = 0.17$, $SE = 0.05$, $p < .001$), suggesting that students

whose goals aligned with their environment were more likely to accommodate. The overall indirect effect via the three authenticity components was also significant (*ab* path: $B = 0.09$, $SE = 0.04$, 95% CI [0.02, 0.17]). For negotiation, autonomy support again showed a significant total effect (*c* path: $B = 0.29$, $SE = 0.06$, $p < .001$) and a significant direct effect ($B = 0.16$, $SE = 0.08$, $p = .048$). This relationship was mediated through social fit ($ab_3 = 0.14$, SE = 0.06, p = .011), indicating that feeling socially authentic supported the use of negotiation as a coping strategy.

To assess the robustness of these findings, I re-ran all mediation models with perceived competence support and relatedness support included as covariates. Across both the unadjusted and adjusted models, autonomy support remained significantly associated with higher self-concept fit, goal fit, and social fit (*a* paths), and social fit consistently predicted greater defiance (b_3 path). Consequently, the indirect effect of autonomy support on defiance via social fit remained significant in both models. However, with competence and relatedness support included, the direct and total effects of autonomy support on defiance were attenuated, suggesting that the unique effect of autonomy support on oppositional behaviour may be partially shared with other forms of need-supportive teaching.

3.4.3.3.2.1 Moderated Mediation Analyses: Defiance

To test whether the indirect effects of autonomy support on defiance were moderated by students' trait reactance, I conducted a final moderated mediation analysis using Model 58 of the PROCESS macro (Hayes, 2017), with defiance as the outcome. As in previous models, autonomy support significantly predicted each component of authenticity (*a* paths), but these associations were not moderated by trait reactance (interaction terms: Bs < .05, ps > .48). Likewise, reactance did not moderate the *b* paths between authenticity components and defiance.

Despite the absence of a significant interaction between social fit and reactance, the conditional indirect effect of autonomy support on defiance through social fit was significant at high levels of trait reactance ($ab_3 = 0.08$, $SE = 0.04$, 95% CI [0.01, 0.17]). This suggests that students higher in trait reactance may be more likely to exhibit defiance when they feel socially authentic. However, given the non-significance of the interaction term, this finding should be interpreted cautiously. Repeating the analysis with competence and relatedness support included as covariates yielded no change in the direction or significance of results, confirming that the moderation findings were robust to the inclusion of additional support dimensions.

3.4.4 Study 2: Discussion

Study 2 replicated key findings from Study 1 in a larger, more diverse sample. Autonomy support was linked to greater wellbeing and lower defiance, as well as increased adaptive coping

behaviours (accommodation and negotiation). These effects were explained by students' feelings of authenticity, especially goal and social fit. Moderated mediation analyses showed limited evidence for the role of reactance. Although reactance did not moderate most paths, the link between social fit and wellbeing was stronger among those higher in trait reactance. There was also some evidence that higher social fit predicted greater defiance for more reactive individuals, suggesting complex dynamics for students who are especially sensitive to control. These patterns held when controlling for competence and relatedness support, highlighting the unique contribution of autonomy support.

3.5 General Discussion

3.5.1 Summary

This study investigated the mechanisms of authenticity and reactance, through which autonomy-supportive teaching influences adolescent wellbeing and autonomy-frustration coping behaviours. Drawing on two samples, current school students and emerging adults reflecting on their secondary education, I examined how perceived autonomy support related to wellbeing, autonomy-frustration coping strategies and authenticity (self-concept fit, goal fit, social fit). Across both samples, the findings broadly supported the hypotheses that autonomy-supportive environments support greater wellbeing and more adaptive coping, with authenticity serving as an explanatory factor. However, some nuanced patterns emerged, especially in relation to defiance and individual differences in reactance, highlighting areas for further investigation.

3.5.1.1 H1: Autonomy Support Predicts Wellbeing and Coping

Consistent with Hypothesis 1, both samples showed that perceived autonomy-supportive teaching was positively associated with wellbeing and reduced defiance during secondary education. Autonomy support consistently correlated with all three facets of authenticity (self-concept fit, goal fit, social fit) in both groups. It was also positively linked to accommodation in both samples, although the relationship with negotiation and submission was less robust. Trait reactance showed expected patterns: negatively related to wellbeing, authenticity, submission, and accommodation, and positively to defiance and negotiation. These associations were generally stronger among current students, particularly for goal fit and defiance. These findings indicate the potential of autonomy-supportive teaching to support student wellbeing and constructive coping, while reducing oppositional behaviours.

Sample 1 consisted of students aged 16–18 who were reporting on their present school experience, while Sample 2 included individuals aged 18–22 who were reflecting retrospectively on their time at school. The generally stronger associations observed in Sample 1, such as the links

between autonomy support and goal fit, or between autonomy support and defiance, may reflect the immediacy and emotional salience of current experiences, likely to be more vivid. In contrast, retrospective accounts in Sample 2 may have been influenced by memory reconstruction, emotional distancing, or a tendency to generalise over time, potentially diluting the strength of associations. There was, however, an additional significant correlation in Sample 2 between autonomy support and negotiation, suggesting that the larger and more statistically powerful sample may have been more sensitive to detecting more subtle relationships.

3.5.1.2 H2: Authenticity Mediates the Effects of Autonomy Support

Regarding wellbeing, authenticity mediated the association with autonomy supportive teaching across both samples, consistent with Hypothesis 2. In Sample 1, autonomy support was significantly associated with increased wellbeing and all three facets of authenticity (self-concept fit, goal fit, and social fit). However, when controlling for autonomy support, only social fit significantly predicted wellbeing, and the overall indirect effect of autonomy support on wellbeing through authenticity was driven primarily by social fit. The indirect effects via self-concept fit and goal fit were non-significant in this sample, which was underpowered. Sample 2 provided stronger support for the mediation hypothesis as autonomy support was robustly associated with wellbeing and all authenticity facets, with all three types of fit significantly predicted wellbeing when controlling for autonomy support.

Regarding autonomy-frustration coping behaviours, there was some support for Hypothesis 2 although the patterns were more complex. In both samples, autonomy support was associated with reduced defiance. Regarding positive coping behaviours, both studies found autonomy support associated with increased accommodation, reflecting students' willingness to adapt and cooperate, with this effect mediated by authenticity. In Sample 1, social fit played a key role in this pathway, while in Sample 2, goal fit emerged as a stronger mediator, suggesting that when students felt aligned with their environment or goals, they were more likely to accommodate. Negotiation, another constructive coping behaviour, was positively associated with autonomy support only in Sample 2, partially explained by both social and self-concept fit. Regarding defiance, the indirect effects of authenticity were inconsistent: in Sample 1, the overall indirect effect was significant but no individual facet uniquely predicted defiance, while in Sample 2, social fit showed a surprising positive indirect link to greater defiance. While these findings provide preliminary evidence that autonomy-supportive teaching promotes more constructive ways for students to handle interpersonal student-teacher challenges through increasing accommodation, the link between autonomy-support, social fit and defiance requires further clarification.

3.5.1.3 H3: Reactance Moderates Authenticity-Wellbeing and Defiance Pathways

Hypothesis 3 proposed that trait reactance would moderate the indirect effects of autonomy-supportive teaching on wellbeing and defiance via authenticity, such that these mediated pathways would be stronger for individuals higher in reactance. Results from Sample 2 provided only partial and somewhat contradictory support. For wellbeing, autonomy support was consistently associated with all facets of authenticity, but reactance only moderated the link between social fit and wellbeing. This association was stronger at higher levels of reactance, suggesting that individuals with elevated reactance may benefit more from feeling socially authentic. Indirect effects via goal fit and social fit also increased with reactance, though they remained significant across all levels. In contrast, the indirect effect via self-concept fit was significant only at low and moderate levels of reactance, not high, partially contradicting the hypothesis.

For defiance, evidence was weaker. Reactance did not moderate the direct paths from authenticity to defiance. While the indirect effect through social fit was significant at high reactance levels, it was in an unexpected direction: greater social fit predicted more defiance among highly reactant individuals. I was unable to corroborate these moderation effects in Study 1 due to the smaller, underpowered sample, limiting our ability to compare across samples. The findings complicate the hypothesised moderation pattern, and although some results hint at a possible counterintuitive role of trait reactance, the small effect sizes warrant cautious interpretation and highlight the need for further research to clarify these relationships.

3.5.2 Integrated Summary

Overall, the findings provide consistent support for Hypotheses 1 and 2, showing that perceived autonomy-supportive teaching in secondary school is positively associated with student wellbeing and the use of more adaptive, autonomous coping behaviours in autonomy-frustrating situations. These results align with those found in parenting contexts (Missotten et al., 2017) and extend the field of literature within Self-Determination Theory (Ryan & Deci, 2000), underscoring the role of autonomy support not only in enhancing wellbeing but also promoting constructive coping behaviours. Across both samples, authenticity emerged as a key psychological mechanism linking autonomy support to positive outcomes. Specifically, when students felt that their intrinsic goals and values aligned with those promoted by their school environment, this sense of authenticity mediated the relationship between autonomy support and both wellbeing and certain coping responses. Authenticity functions both as an outcome of autonomy-supportive teaching and as a pathway through which it exerts broader benefits.

While these findings offer preliminary insights, they represent only an initial step in understanding the interplay between autonomy support, authenticity, and trait reactance during adolescence and emerging adulthood. Reactance is conceptualised as an oppositional response associated with negative mood, specifically anger (Steindl et al., 2015). However, our results suggest that, under certain conditions, trait reactance may also facilitate authenticity, prompting individuals to resist external pressures in ways that align with their true values. This dual role complicates simplistic interpretations of reactance as wholly maladaptive and points to the importance of context. More research is needed to examine how trait reactance may shape the impact of autonomy support and authenticity on positive and negative coping behaviours and to refine theoretical models capturing these dynamics in educational settings.

3.5.3 Limitations and Future Directions

A key limitation of Study 1 is the low participation rate, which restricts the generalisability of the findings to the broader student population and the use of convenience sampling across both studies was vulnerable to selection bias. Participants who opted into the studies might have held more favourable views of their education or been more motivated to engage in reflective thinking about their learning experiences, potentially skewing the results. As the study was conducted within a school setting, it is likely that the most persistently absent pupils, those who may be at greatest risk of low wellbeing and disengagement, were underrepresented. A different sampling method, such as purposive or stratified recruitment based on attendance data, could have captured the perspectives of this critical subgroup. For example, Denault and Guay (2021) implemented a stratified sampling strategy using deprivation indices, including socioeconomic status and low-income thresholds, to focus on the experiences of students who are frequently underrepresented in broader educational research.

Moreover, the correlational design employed in both studies precludes definitive causal conclusions. While the observed associations between autonomy-supportive teaching, wellbeing, authenticity, and adaptive coping behaviours align with theoretical expectations, it remains unclear the extent to which students' existing wellbeing and coping capacities also influence their perceptions of autonomy support. As positive emotions can enhance authenticity (Lenton et al., 2013), more positive school experiences facilitated by existing wellbeing and positive coping strategies may lead to reciprocal relationships. Longitudinal research would support understanding of the trajectories of students with varying levels of trait reactance and elucidating how autonomy and authenticity contribute to helping highly reactant students cope more adaptively in school. For example, Laird and Frazer (2020) followed adolescents over two years and found that reactance and negative mood did not mediate the link between parental psychological control and behavioural outcomes. Instead, adolescents' emotional reactions appeared to predict controlling parenting, suggesting it may reflect a

response to stable adolescent traits. These findings not only demonstrate the value of longitudinal designs but also highlight the need for school-based research to better understand and interrupt relational patterns, particularly to support more reactant students who may be especially vulnerable to feeling controlled and disengaged. Experimental research to test direct causal mechanisms would support theory development further, for example examining the impact of priming students with an autonomy-supportive writing task on measures of wellbeing, authenticity, and coping responses.

A further limitation pertains to the measurement of autonomy support. Study 1 involved current students engaging with multiple teachers across different subjects on a daily basis. Here, a more fine-grained approach, such as teacher-specific or subject-specific autonomy support measures, could have provided richer insights into how individual classroom interactions influence student authenticity and related outcomes. Experience sampling methods (ESM) could be valuable, capturing students' autonomy experiences in real-time or shortly after specific lessons, providing contextualised and dynamic data. For example, van der Kaap-Deeder and colleagues (2023) used ESM to track adolescents' momentary affect in relation to autonomy-supportive and psychologically controlling interactions with parents. Adolescents reported their emotions and perceptions of parental behaviour multiple times daily over a week, revealing immediate and lagged emotional effects of autonomy support and control. Applying a similar approach in school settings where students report on classroom interactions and emotional states in real-time could uncover how individual teacher interactions influence student wellbeing, authenticity, and different coping responses on a micro-timescale.

3.5.4 Implications

The findings of this study carry important implications for educational practice and policy. Although the role of autonomy in motivation is well-recognised within education, communication research, particularly on psychological reactance, offers valuable insights into how students respond to demands and requests which can signal an autonomy-threat. At the classroom level, the benefits of autonomy-supportive teaching for wellbeing and adaptive coping underscore the importance of equipping educators with strategies to reduce reactance. Crucially, autonomy support does not require the removal of structure or consequences, but rather a shift in how requests are communicated to preserve students' sense of volition. Teacher training programs should prioritise practical tools for using autonomy-supportive language, even within the constraints of standardised curricula. Strategies shown to reduce reactance include using clear, concrete language (Ball & Goodboy, 2014), avoiding guilt appeals (Bessararova et al., 2015), promoting fairness (Frey et al., 2021), incorporating restoration postscripts that reaffirm choice (Bessararova et al., 2013), and encouraging perspective-taking (Steindl & Jonas, 2013). Explicitly embedding these communication techniques further into

teaching practice could help educators better meet students' psychological needs and reduce classroom conflict.

Building on the importance of autonomy-supportive teaching, the findings also indicate the value of promoting student authenticity as a complementary pathway to wellbeing. This study demonstrated a strong association between authenticity and wellbeing across two samples. As authenticity is associated with positive mood and lower emotion regulation efforts (Landa & English, 2022) as well as prosocial behaviour (Toper et al., 2023), evidence is building to suggest student authenticity should be a key facet of supportive classroom climates to encourage positive behaviour and wellbeing. As well as autonomy-supportive communication practices, suggestions for increasing student authenticity include student-led, interest-based inquiry (Raihman et al., 2024), promoting perspective-taking (Ubani, 2018), and leadership programmes (Molina-López et al., 2024). Further research is needed to better understand how these approaches function in practice, which strategies are most effective, and for which students they work best, ensuring interventions are tailored to diverse learner needs and contexts.

Beyond the classroom, the results also speak to broader issues of educational policy. With assessment and accountability practices intensifying in secondary education worldwide (Teltemann & Jude, 2019), it is critical that student psychological needs remain central to educational goals. Supporting these needs requires not only attention to classroom interactions, but also systemic changes that enable teachers to adopt autonomy-supportive practices (Reeve & Assor, 2011). If teacher communication style functions as a key agent of change, educational institutions must therefore consider how to support teachers in this role. Evidence suggests communication between senior leadership and teachers can promote an autonomy-supportive culture at all levels (Adams & Olsen, 2017). Teachers' sense of competence has been identified as a crucial factor supporting autonomy-supportive teaching (Bennett et al., 2017). Additionally, research by Roth et al. (2007) highlights that teachers who experience greater autonomy themselves are more likely to implement autonomy-supportive practices in their classrooms. However, the prevailing assessment-focused system constrains teacher autonomy by emphasising performative accountability measures, which risk undermining students' experiences of autonomy and authenticity. Educational policy must therefore consider the impact of testing demands and find ways to empower teachers with professional freedom to meet their psychological needs, in turn meeting the needs of students.

3.5.5 Conclusion

This study provided preliminary evidence regarding the interaction between student autonomy, authenticity, wellbeing, and autonomy-frustration coping behaviours in secondary school settings. In addition, it shed light on the potentially complex role of trait reactance in shaping these relationships,

suggesting important avenues for further exploration into how individual differences influence responses to autonomy support and frustration within educational contexts. These findings highlight the importance of educational climates that are responsive to the psychological needs of students, particularly the need for autonomy and its role in supporting students' sense of authenticity at school. Consequently, a truly inclusive institution would accommodate the diverse goals, self-concepts, and social orientations students bring into the classroom. To cultivate resilient students capable of managing the necessary challenges of learning, educational systems should prioritise autonomy-supportive practices, informed by psychological and communication research, to nurture student individuality and wellbeing.

Appendix A Appendices Relating to Chapter 2

A.1 Critical Appraisal Summary

First Author, Date	Items from JBI Checklist for Analytical Cross-Sectional Studies[1]								Judgment	Reviewer
	1	2	3	4	5	6	7	8		
Vansteenkiste (2012)	Y	Y	Y	Y	Y	Y	Y	Y	Included	1
Shih (2013)	Y	Y	Y	Y	Y	Y	Y	Y	Included	1
Diseth (2014)	Y	Y	Y	Y	P	P	Y	Y	Included	1
Shih (2015)	Y	Y	Y	Y	P	N	Y	Y	Included	1
Pikó (2015)	Y	Y	Y	Y	P	P	Y	Y	Included	2
To (2017)	Y	Y	Y	Y	Y	Y	Y	Y	Included	1
Simões (2018a)	Y	Y	Y	Y	Y	Y	Y	Y	Included	2
Simões (2018b)	Y	Y	Y	Y	Y	Y	Y	Y	Included	1
Filippello (2019)	Y	Y	Y	Y	N	N	Y	Y	Included	1
Alivernini (2019)	Y	Y	Y	Y	Y	Y	Y	Y	Included	2
Lan (2019)	Y	Y	Y	Y	Y	Y	Y	Y	Included	2
Peng (2020)	Y	Y	Y	Y	Y	Y	Y	Y	Included	2
Schmidt (2020)	Y	Y	Y	Y	Y	Y	Y	Y	Included	2
Charlot Colomès (2021)	Y	Y	Y	Y	P	Y	Y	Y	Included	1
Collie (2021)	Y	Y	Y	Y	Y	Y	Y	Y	Included	2
Gueta (2022)	Y	Y	Y	Y	Y	Y	Y	Y	Included	2
Lee (2022)	Y	Y	Y	Y	P	P	Y	Y	Included	1
Martinek (2022)	Y	Y	Y	Y	P	N	Y	Y	Included	2

Lan (2022)	Y	Y	Y	Y	Y	Y	Y	Y				Included	1
Ma (2022)	Y	Y	Y	Y	Y	Y	Y	Y				Included	2
Liu (2023)	Y	Y	Y	Y	Y	Y	Y	Y				Included	1
Collie (2024)	Y	Y	Y	Y	Y	Y	Y	Y				Included	1
Items from JBI Checklist for Cohort Studies[2]													
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**		
Yu, (2016)	NA	NA	Y	Y	Y	NA	Y	Y	Y	Y	Y	Included	2
Kiefer, (2017)	NA	NA	Y	Y	Y	NA	Y	Y	Y	P	Y	Included	1
Lee (2019)	NA	NA	Y	Y	Y	NA	Y	Y	P	U	Y	Included	1
Lee (2020)	NA	NA	Y	Y	Y	NA	Y	Y	P	U	Y	Included	2
Zhang (2022)	NA	NA	Y	Y	Y	NA	Y	Y	Y	Y	Y	Included	2
Kleinkorres (2023)	NA	NA	Y	Y	Y	NA	Y	Y	P	U	Y	Included	1
Kristensen (2024)	Y	Y	Y	Y	Y	NA	Y	Y	U	Y	Y	Included	2
Items from JBI Checklist for Randomised Controlled Trials[3]													
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**		
Cheon (2023)	U	U	Y	N	N	NA	Y	Y	Y	Y	Y	Y	Y	Included	1
Paulmann (2023)	Y	U	Y	N	NA	NA	Y	NA	Y	Y	Y	Y	Y	Included	1

Note: Y=Yes; N=No; P=Partially, U=Unclear; N=Not Applicable

[1] Items from JBI Checklist for Analytical Cross Sectional Studies Critical Appraisal Tool

1. Were the criteria for inclusion in the sample clearly defined?
2. Were the study subjects and the setting described in detail?
3. Was the exposure measured in a valid and reliable way?

4. Were objective, standard criteria used for measurement of the condition?
5. Were confounding factors identified?
6. Were strategies to deal with confounding factors stated?
7. Were the outcomes measured in a valid and reliable way?
8. Was appropriate statistical analysis used?

[2] **Items from JBI Checklist for Cohort Studies Critical Appraisal Tool**

1. Were the two groups similar and recruited from the same population?
2. Were the exposures measured similarly to assign people to both exposed and unexposed groups?
3. Was the exposure measured in a valid and reliable way?
4. Were confounding factors identified?
5. Were strategies to deal with confounding factors stated?
6. Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?
7. Were the outcomes measured in a valid and reliable way?
8. Was the follow up time reported and sufficient to be long enough for outcomes to occur?
9. Was follow up complete, and if not, were the reasons to loss to follow up described and explored?
10. Were strategies to address incomplete follow-ups utilized?
11. Was appropriate statistical analysis used?

[3] **Items from JBI Checklist for RCTs Critical Appraisal Tool**

1. Was true randomization used for assignment of participants to treatment groups?
2. Was allocation to groups concealed?
3. Were treatment groups similar at the baseline?
4. Were participants blind to treatment assignment?
5. Were those delivering treatment blind to treatment assignment?
6. Were outcomes assessors blind to treatment assignment?
7. Were treatment groups treated identically other than the intervention of interest?
8. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analysed?
9. Were participants analysed in the groups to which they were randomized?
10. Were outcomes measured in the same way for treatment groups?
11. Were outcomes measured in a reliable way?
12. Was appropriate statistical analysis used?
13. Was the trial design appropriate for the topic, and any deviations from the standard RCT design accounted for in the conduct and analysis

A.2 Table of Autonomy-Support Measures

Autonomy Support Measure	N	Study Number
Learning Climate Questionnaire – autonomy subscale (LCQ; Williams and Deci, 1996)	16	2, 3, 4, 6, 12, 13, 15, 20, 23, 24, 25, 26, 28, 29, 30, 31,
Basic Psychological Need Satisfaction Scale – autonomy subscale (BPNSS; Deci & Ryan, 2000).	4	11, 23, 28, 6
Teacher as a Social Context (TASC-Q; Belmont et al., 1988)	3	1, 7, 11
Basic Needs Satisfaction in General Scale – autonomy subscale (La Guardia et al., 2000).	3	6, 9, 10
Autonomy Support from Parents and Teachers Scale (Hadre & Reeve, 2003)	2	14, 17
Autonomy Support Questionnaire (ASQ; Deci et al., 2006)	2	22, 23
Perceived Parental Autonomy Support Scale - adapted for teachers (P-PASS; Mageau et al., 2015)	1	18
Perception of Parents Scale - adapted for teachers (POPS; Grolnick et al., 1997)	1	8
Psychological Control Teaching Scale (PCTS; Soenens et al., 2012)	1	11
Adolescent Students' Basic Psychological Needs at School Scale – autonomy subscale (ASBPNSS; Tian et al., 2014)	1	16
Psychological Needs Questionnaire – autonomy and competence subscales (Kunter et al., 2007)	1	21
Teacher Behaviour Scale (Stöber et al., 2002).	1	5
Perceived Teacher Autonomy Support Questionnaire (Jia et al., 2009)	1	6
Bespoke items	2	19, 28

Appendix B Appendices Relating to Chapter 3

B.1 Taxonomy of Autonomy Frustration-Coping Responses (Skinner & Edge, 2002).

	CONCESSION	DEFENSE
AUTONOMOUS	**Challenge to SELF** Implement AUTHENTIC Action **Accommodation** Cooperation Concession Acquiesce Defer Acceptance Good will Commitment Conviction Endorsement	**Challenge to CONTEXT** Promote AUTONOMY SUPPORT **Negotiation** Blamelessness Taking other's perspective Good will Decision-making Goal-setting Priority-setting
NONAUTONOMOUS	**Threat to SELF** Promote COERCION **Perseveration** Compliance Conformity Rigidity Submission Self-blame Urgency Compulsion Obsession Rumination Intrusive thoughts	**Threat to CONTEXT** Reduce Opportunities for AUTONOMOUS Action **Opposition** Aggression Projection Blame others Venting Explosion Anger Reactance Revenge

Note. Within each column, the way of coping in bold is the most common label for that family of ways of coping.

Figure 14.4. Families of Coping Associated with Autonomy.

B.2 Pre-registration Document on AsPredicted

Title: Authenticity as a Pathway to Adaptive Coping with Autonomy Frustration (#227380)

Author(s) Pre-registered on: 2025/05/09 - 04:11 AM (PT)

Laura Pardoe (Lead Researcher, University of Southampton)

Dr Nick Kelley (Primary Supervisor, University of Southampton)

Dr Pascal Burgmer (Secondary Supervisor, University of Southampton)

Elise Taylor (Research Assistant, University of Southampton)

1) Have any data been collected for this study already?

No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?

- Hypothesis 1: Participants who have experienced more autonomy - supportive teaching will report higher levels of positive (i.e., accommodation, negotiation), lower levels of negative (i.e., defiance, submission) behaviours during secondary education, and higher psychological wellbeing.
- Hypothesis 2: The association between autonomy- supportive teaching and both: behaviours during secondary education and wellbeing will be mediated by authenticity, particularly authenticity as goal fit.
- Hypothesis 3: The indirect effect in Hypothesis 2 will be moderated by trait reactance. Specifically, we hypothesize that for high (vs. low) reactance, participants the path from autonomy - supportive teaching to behaviours during secondary education/wellbeing via authenticity will be stronger. (Exploratory)

3) Describe the key dependent variable(s) specifying how they will be measured.

1. Learning Climate Questionnaire (Williams & Deci, 1996)

2. SAFE Scale (Aday et al., 2024)

3. Anticipated Behavioural Intention Questionnaire (Van Petegem et al., 2013)

a. Adapted for retrospection about perceived unfair or disagreeable rule-setting by teachers. Presented with the prompt "When my teacher asked me to do something I didn't agree with, I ", adolescents rate 22 items that reflect four distinct behavioural response styles: Submission (e.g., "I complied submissively"), Negotiation (e.g., "I tried to reach an agreement that was good for both parties"), Accommodation (e.g., "I tried to understand that these rules were actually well-meant intentions"), Defiance (e.g., "I simply disregarded the rules")

b. These four response types will be combined into two composite measures for analysis. Positive responses will include negotiation and accommodation, as they reflect constructive engagement with rules and authority, often linked to better psychological outcomes. In contrast, negative responses will comprise defiance and submission, which represent either resistance or passive compliance, and are generally associated with poorer emotional and motivational outcomes.

4. The Brief Inventory of Thriving (Su et al., 2014)

a. Adapted for retrospective recall of wellbeing during secondary education

5. Hong Psychological Reactance Scale (Hong & Felder, 1996)

a. Adapted for retrospective reports of trait reactance during secondary education

4) How many and which conditions will participants be assigned to?

N/A

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.

We will use bivariate correlations to test Hypothesis 1. We will use mediational analysis (Process Macro Model 4; Hayes et al., 2017) and moderation analysis (Process Macro Model 59, Hayes et al., 2017) to test Hypothesis 2.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

Participants who fail more than one attention check will be excluded from analysis.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

We used a web-based tool to conduct a Monte Carlo Power Analysis for Indirect Effects (Schoemann et al., 2017). We used the correlations from our first study to inform the power analysis for this study. In Study 1, we observed moderate to large correlations between most study variables. We sought to be more cautious here and wanted 80% power to detect small correlations ($r = .20$). Based on this 317 participants are needed. We sought to have at least 500 participants in our final sample to account for the larger sample size needed for moderated mediation analysis. Thus, we will recruit 550 participants to account for possible data loss (e.g., attention check failure).

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

We will use a moderated mediation analysis to explore reactance as a moderator of the indirect effect of Hypothesis

B.3 Ethics Documents

Participant Information Sheet

Study Title: Student autonomy, authenticity and behavioural intentions

Researcher: Laura Pardoe

You have been invited to take part in a research study. This project is being conducted by a trainee Educational Psychologist and the write-up of this research contributes to their successful completion of the Doctorate in Educational Psychology (DEdPsych).

The project will use an online questionnaire to explore your reflections on:

- being your true self at school
- your sense of freedom at school
- your intentions to follow rules and teacher instructions

Why have I been asked to participate?

Participants are being approached to participate in this project who are attending school, or attended school for the majority of the time between the ages of 14-18.

What will I do to participate in this project?

If you choose to take part, you will answer questions through an online survey tool called Qualtrics. This should take around thirty minutes.

Are there any benefits in taking part?

This research project aims to help understand student behaviour and the role of students' sense of authenticity and autonomy at school. Participants may find benefit in reflecting on their own school experiences in terms of making sense of their behaviour and response to rules in a school environment. You will also receive remuneration for your time via the Prolific platform.

Are there any risks involved?

It is not expected that participating in this project carries any risks and this has been approved by the Ethics Research and Governance Board at the University of Southampton. Your participation is voluntary and you will be able to choose to exit the questionnaire at any time without penalty.

What data will be collected?

The data collected will be your survey answers along with some demographic data regarding your age and gender. Providing demographic data is optional and you may take part in the study without disclosing your demographic data. You will not be asked for their address, phone number or any other identifying information.

Will my participation be confidential?

Your participation and the answers you provide during the research will be kept strictly confidential.

Only members of the research team and responsible members of the University of Southampton may be given access to the data for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations. Individuals from regulatory authorities (people who check that we are carrying out the study

correctly) may require access to your data. All of these people must keep your information, as a research participant, strictly confidential.

You will create a unique identifying code which will be securely stored using University systems. This enables us to ensure that the appropriate consent was gained and enables us to remove the data if you wish (please also see 'What happens if I change my mind?' section below), after which this information will destroyed.

The final write-up of the project will be viewed by tutors on the Doctorate in Educational Psychology programme at the university. The write-up will not include your name and you will not be identifiable in any write-ups or publications of this research.

Do I have to take part?

Your participation is optional. There is no penalty for choosing not to take part.

What happens if I change my mind?

You have the right to change your mind and withdraw your data from the project at any time without giving a reason and without your rights being affected. Data analysis will begin within one month of participation, at which point it will not be possible to withdraw data as it will have been integrated into a larger data set.

If you wish to withdraw your data from the project, you will need to contact the researcher or research supervisor, whose contact details can be found on the consent form.

What will happen to the results of the research?

Research findings made available in any reports or publications will not include information that can identify you. The project will be written up as part of the requirements for the Doctorate in Educational Psychology programme. The project may also be published in an academic journal following write up and editing, under the supervision of the project supervisor.

Where can I get more information?

If you would like more information about the project, please contact the researcher using the following email address: l.a.e.pardoe@soton.ac.uk

What happens if there is a problem?

If you have a concern about any aspect of this study, you should speak to the researchers who will do their best to answer your questions.

If you have a complaint about any aspect of this study, please contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

Thank you for taking the time to read the information sheet and considering taking part in the research.

Data Protection Privacy Notice

The University of Southampton conducts research to the highest standards of research integrity. As a publicly-funded organisation, the University has to ensure that it is in the public interest when we use personally-identifiable information about people who have agreed to take part in research. This means that when you agree to take part in a research study, we will use information about you in the ways needed, and for the purposes specified, to conduct and complete the research project. Under data protection law, 'Personal data' means any information that relates to and is capable of identifying a living individual. The University's data protection policy governing the use of personal data by the

University can be found on its website (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page).

This Participant Information Sheet tells you what data will be collected for this project and whether this includes any personal data. Please ask the research team if you have any questions or are unclear what data is being collected about you.

Our privacy notice for research participants provides more information on how the University of Southampton collects and uses your personal data when you take part in one of our research projects and can be found at http://www.southampton.ac.uk/assets/sharepoint/intranet/ls/Public/Research%20and%20Integrity%20Privacy%20Notice/Privacy%20Notice%20for%20Research%20Participants.pdf

Any personal data we collect in this study will be used only for the purposes of carrying out our research and will be handled according to the University's policies in line with data protection law. If any personal data is used from which you can be identified directly, it will not be disclosed to anyone else without your consent unless the University of Southampton is required by law to disclose it.

Data protection law requires us to have a valid legal reason ('lawful basis') to process and use your Personal data. The lawful basis for processing personal information in this research study is for the performance of a task carried out in the public interest. Personal data collected for research will not be used for any other purpose.

For the purposes of data protection law, the University of Southampton is the 'Data Controller' for this study, which means that we are responsible for looking after your information and using it properly. The University of Southampton will keep identifiable information about you for 10 years after the study has finished after which time any link between you and your information will be removed.

To safeguard your rights, we will use the minimum personal data necessary to achieve our research study objectives. Your data protection rights – such as to access, change, or transfer such information - may be limited, however, in order for the research output to be reliable and accurate. The University will not do anything with your personal data that you would not reasonably expect. Pseudonyms will be used throughout all stages of data collection and analysis.

If you have any questions about how your personal data is used, or wish to exercise any of your rights, please consult the University's data protection webpage (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page) where you can make a request using our online form. If you need further assistance, please contact the University's Data Protection Officer (data.protection@soton.ac.uk).

B.4 Supplementary Mediation Analyses

Table 1. *Mediation Analysis of Three Types of Authenticity on Relationship between Autonomy Support and Coping Behaviours (in Study 1-Student Data)*

Outcome	Total effect (*c*)		Direct effect (*c'*)		Mediator	IV on mediator (*a* path)		Unique effect of mediator (*b* path)		Indirect effect (ab_1, ab_2, ab_3)			Overall Indirect effect (*ab*)		
	Effect (*SE*)	*p*	Effect (*SE*)	*p*		Effect (*SE*)	*p*	Effect (*SE*)	*p*	Effect (*SE*)	95% CIs	Sig.	Effect (*SE*)	95% CIs	Sig.
Defiance	-0.93 (0.08)	<.001	-0.57 (0.11)	<.001	SC fit	0.86 (0.06)	<.001	-0.19 (0.14)	.169	-0.17 (0.13)	-0.42, 0.07	N	-0.37 (0.08)	-0.53, -0.21	Y
					Goal fit	0.92 (0.06)	<.001	-0.24 (0.13)	.073	-0.22 (0.13)	-0.48, 0.05	N			
					Social fit	0.51 (0.08)	<.001	0.03 (0.08)	.685	0.02 (0.04)	-0.06, 0.11	N			
Submission	0.24 (0.08)	.003	0.01 (0.11)	.923	SC fit	0.86 (0.06)	<.001	0.22 (0.14)	.111	0.19 (0.14)	-0.07, 0.48	N	0.22 (0.09)	0.06, 0.40	Y
					Goal fit	0.92 (0.06)	<.001	0.21 (0.13)	.113	0.19 (0.13)	-0.07, 0.44	N			
					Social fit	0.51 (0.08)	<.001	-0.31 (0.08)	<.001	-0.16 (0.05)	-0.28, -0.07	Y			
Negotiation	0.06 (0.07)	.426	0.17 (0.10)	.097	SC fit	0.86 (0.06)	<.001	-0.01 (0.13)	.951	-0.01 (0.14)	-0.28, 0.27	N	-0.12 (0.09)	-0.31, 0.05	N
					Goal fit	0.92 (0.06)	<.001	-0.18 (0.12)	.145	-0.16 (0.15)	-0.46, 0.13	N			
					Social fit	0.51 (0.08)	<.001	0.10 (0.07)	.183	0.06 (0.06)	-0.07, 0.17	N			
Accommodation	0.31 (0.05)	<.001	0.10 (0.07)	.138	SC fit	0.86 (0.06)	<.001	0.08 (0.09)	.377	0.07 (0.07)	-0.07, 0.23	N	0.21 (0.07)	0.09, 0.35	Y
					Goal fit	0.92 (0.06)	<.001	0.09 (0.08)	.299	0.08 (0.07)	-0.07, 0.22	N			
					Social fit	0.51 (0.08)	<.001	0.13 (0.05)	.015	0.06 (0.03)	0.01, 0.12	Y			

Significance (Sig.) column reflects whether the indirect effect (*ab*) 95% confidence interval excludes zero. N=182.

Table 2. *Mediation Analysis of Three Types of Authenticity on Relationship between Autonomy Support and Coping Behaviours (in Study 1 - Student Data) with Relatedness Support and Competence Support added as Covariates*

Outcome	Total effect (*c*)		Direct effect (*c'*)		Mediator	IV on mediator (*a* path)		Unique effect of mediator (*b* path)		Indirect effect (ab_1, ab_2, ab_3)			Overall Indirect effect (*ab*)		
	Effect (*SE*)	***p***	**Effect (*SE*)**	***p***		**Effect (*SE*)**	***p***	**Effect (*SE*)**	***p***	**Effect (*SE*)**	**95% CIs**	**Sig.**	**Effect (*SE*)**	**95% CIs**	**Sig.**
Defiance	-0.49 (0.16)	.002	-0.33 (0.16)	.040	Self-concept fit	0.50 (0.13)	<.001	-0.23 (0.14)	.117	-0.11 (0.09)	-0.31, 0.03	N	-0.16 (0.07)	-0.32, -0.04	Y
					Goal fit	0.45 (0.12)	<.001	-0.16 (0.14)	.236	-0.07 (0.08)	-0.24, 0.06	N			
					Social fit	0.29 (0.15)	.059	0.07 (0.09)	.433	0.02 (0.03)	-0.30, 0.11	N			
Submission	0.26 (0.16)	.102	0.13 (0.16)	.428	Self-concept fit	0.50 (0.13)	<.001	0.22 (0.14)	.123	0.11 (0.09)	-0.04, 0.32	N	0.14 (0.08)	-0.02, 0.32	N
					Goal fit	0.45 (0.12)	<.001	0.27 (0.13)	.044	0.12 (0.08)	-0.01, 0.30	N			
					Social fit	0.29 (0.15)	.059	-0.33 (0.09)	< .001	-0.10 (0.07)	-0.27, 0.02	N			
Negotiation	0.01 (0.14)	.942	0.07 (0.15)	.621	Self-concept fit	0.50 (0.13)	<.001	0.01 (0.14)	.919	0.01 (0.09)	-0.17, 0.20	N	-0.06 (0.07)	-0.21, 0.54	N
					Goal fit	0.45 (0.12)	<.001	-0.22 (0.13)	.094	-0.10 (0.08)	-0.29, 0.04	N			
					Social fit	0.29 (0.15)	.059	0.09 (0.08)	.265	0.03 (0.04)	-0.05, 0.13	N			
Accommodation	0.29 (0.10)	.005	0.17 (0.10)	.091	Self-concept fit	0.50 (0.13)	<.001	0.06 (0.09)	.500	0.03 (0.05)	-0.05, 0.14	N	0.12 (0.07)	0.02, 0.27	Y
					Goal fit	0.45 (0.12)	<.001	0.11 (0.09)	.207	0.05 (0.04)	-0.03, 0.14	N			
					Social fit	0.29 (0.15)	.059	0.14 (0.05)	.013	0.04 (0.03)	-0.01, 0.13	N			

Significance (Sig.) column reflects whether the indirect effect (*ab*) 95% confidence interval excludes zero. N=182.

Table 3. *Mediation Analysis of Three Types of Authenticity on Relationship between Autonomy Support and Coping Behaviours (in Study 2 - Prolific Data)*

Outcome	Total effect (*c*)		Direct effect (*c'*)		Mediator	IV on mediator (*a* path)		Unique Effect of mediator (*b* path)		Indirect effect (ab_1, ab_2, ab_3)			Overall Indirect Effect (*ab*)		
	Effect (*SE*)	***p***	**Effect (*SE*)**	***p***		**Effect (*SE*)**	***p***	**Effect (SE)**	***p***	**Effect (*SE*)**	**95% CIs**	**Sig.**	**Effect (*SE*)**	**95% CIs**	**Sig.**
Defiance	-0.23 (0.05)	<.001	-0.19 (0.07)	.005	Self-concept fit	0.86 (0.04)	<.001	-0.04 (0.06)	.490	-0.03 (0.05)	-0.14, 0.07	N	-0.04 (0.05)	-0.14, 0.06	N
					Goal fit	0.82 (0.04)	<.001	-0.10 (0.06)	.110	-0.08 (0.05)	-0.19, 0.02	N			
					Social fit	0.64 (0.05)	<.001	0.12 (0.05)	.011	0.08 (0.03)	0.02, 0.14	Y			
Submission	-0.08 (0.04)	.065	-0.06 (0.06)	.314	Self-concept fit	0.86 (0.04)	<.001	-0.03 (0.05)	.532	-0.03 (0.04)	-0.11, 0.06	N	-0.02 (0.05)	-0.11, 0.07	N
					Goal fit	0.82 (0.04)	<.001	0.18 (0.06)	.002	0.15 (0.05)	0.05, 0.24	Y			
					Social fit	0.64 (0.05)	<.001	-0.22 (0.04)	.<.001	-0.14 (0.03)	-0.20, -0.09	Y			
Negotiation	0.29 (0.06)	<.001	0.16 (0.08)	.048	Self-concept fit	0.86 (0.04)	<.001	0.07 (0.07)	.306	0.06 (0.06)	-0.06, 0.17	N	0.13 (0.06)	0.02, 0.25	Y
					Goal fit	0.82 (0.04)	<.001	-0.02 (0.08)	.788	-0.02 (0.07)	-0.15, 0.11	N			
					Social fit	0.64 (0.05)	<.001	0.14 (0.06)	.011	0.07 (0.03)	0.01, 0.12	Y			
Accommodation	0.23 (0.04)	<.001	0.14 (0.05)	.005	Self-concept fit	0.86 (0.04)	<.001	-0.04 (0.04)	.336	-0.03 (0.03)	-0.11, 0.04	N	0.09 (0.04)	0.02, 0.17	Y
					Goal fit	0.82 (0.04)	<.001	0.17 (0.05)	<.001	0.14 (0.04)	0.06, 0.22	Y			
					Social fit	0.64 (0.05)	<.001	-0.19 (0.04)	.580	-0.12 (0.02)	-0.06, 0.03	N			

Significance (Sig.) column reflects whether the indirect effect (*ab*) 95% confidence interval excludes zero. N=549.

Table 4. *Mediation Analysis of Three Types of Authenticity on the Relationship between Autonomy Support and Coping Behaviours (in Study 2 - Prolific Data) with Relatedness Support and Competence Support added as Covariates*

Outcome	Total effect (*c*)		Direct effect (*c'*)		Mediator	IV on mediator (*a* path)		Unique Effect of mediator (*b* path)		Indirect effect (ab_1, ab_2, ab_3)			Overall Indirect Effect (*ab*)		
	Effect (*SE*)	***p***	**Effect (*SE*)**	***p***		**Effect (*SE*)**	***p***	**Effect (*SE*)**	***p***	**Effect (*SE*)**	**95% CIs**	**Sig.**	**Effect (*SE*)**	**95% CIs**	**Sig.**
Defiance	0.04 (0.10)	.717	0.03 (0.07)	.781	Self-concept fit	0.76 (0.11)	< .001	-0.05 (0.06)	.423	-0.03 (0.05)	-0.13, 0.06	N	0.01 (0.03)	-0.07, 0.09	N
					Goal fit	0.49 (0.08)	< .001	-0.06 (0.07)	.297	-0.03 (0.03)	-0.10, 0.03	N			
					Social fit	0.67 (0.11)	< .001	0.11 (0.05)	.018	0.07 (0.03)	0.02, 0.15	Y			
Submission	-0.23 (0.09)	.012	-0.15 (0.10)	.119	Self-concept fit	0.76 (0.11)	< .001	-0.02 (0.05)	.639	-0.02 (0.04)	-0.10, 0.05	N	-0.08 (0.04)	-0.17, -0.01	Y
					Goal fit	0.49 (0.08)	< .001	0.15 (0.06)	.007	0.08 (0.03)	0.02, 0.15	Y			
					Social fit	0.67 (0.11)	< .001	-0.21 (0.04)	< .001	-0.14 (0.04)	-0.22, -0.08	Y			
Negotiation	0.45 (0.12)	< .001	0.30 (0.13)	.019	Self-concept fit	0.76 (0.11)	< .001	0.07 (0.07)	.315	0.05 (0.05)	-0.06, 0.16	N	0.14 (0.05)	0.06, 0.24	Y
					Goal fit	0.49 (0.08)	< .001	-0.00 (0.08)	.961	-0.00 (0.04)	-0.08, 0.08	N			
					Social fit	0.67 (0.11)	< .001	0.14 (0.06)	.012*	0.09 (0.04)	0.02, 0.18	Y			
Accommodation	0.00 (0.08)	.956	-0.03 (0.08)	.674	Self-concept fit	0.76 (0.11)	< .001	-0.03 (0.04)	.446	-0.02 (0.03)	-0.09, 0.04	N	0.04 (0.03)	-0.02, 0.09	N
					Goal fit	0.49 (0.08)	< .001	0.14 (0.05)	.004	0.07 (0.03)	0.02, 0.15	Y			
					Social fit	0.67 (0.11)	< .001	-0.01 (0.03)	.765	-0.01 (0.02)	-0.06, 0.05	N			

Significance (Sig.) column reflects whether the indirect effect (*ab*) 95% confidence interval excludes zero. N=549.

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