Systematic Review

Social, Cognitive, and Motivational Changes in Students' Transitions to Secondary School: A Systematic Review

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Abstract

Understanding students' multifaceted changes during transitions from primary to secondary school is essential for promoting positive educational outcomes and lifelong learning. Theoretical approaches and evidence suggest the need for frequent adjustments of the transition offer. Therefore, the current systematic review aimed to provide an updated synthesis covering the period from 2020 to 2024, extending previous overviews of the multifaceted social, cognitive, and motivational changes during students' transitions from primary to secondary school. Grounded in the multiple and multidimensional transitions theory, this review integrates theoretical perspectives on students' development and perceived school-related environments to explore the multifaceted dynamics of educational transitions. Following the PRISMA reporting guidelines, 12 studies with research results from *n* = 8,158 students from eight countries were included in the current synthesis. The results indicate that the students' transitions to secondary school are socially related to changes in peer dynamics, teacher-student relationships, and identity formation. Cognitively, the transitions were associated with conceptual and abstract reasoning. Motivationally, the transitions were associated with goal orientation and psychological needs. The current systematic review highlights the heterogeneity of students' transition experiences. However, these experiences seem to be more positive than previous syntheses suggested. Thus, a review of intervention effects that may make students' transitions smoother, focusing on social learning, cognitive activation, and motivation would be valuable. Such a review could inform the development of targeted strategies to address students' diverse needs during this critical period. Additionally, examining the long-term outcomes of these interventions could provide insights into how they shape students' academic and emotional trajectories.

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Introduction
The structure and timing of school entry and the primary-to-secondary transitions vary significantly across countries. In many educational systems, the existence of primary and secondary schools is traditionally based on developmental, educational, and organisational considerations (Weinert, Rossbach, et al., 2024; Xiong, 2024). Children and adolescents experience significant physical, social-emotional, cognitive, and motivational development as they grow (Garber et al., 2016; Ortega et al., 2007), and primary schools are specifically designed to focus on foundational skills, nurturing environments, and a broad-based curriculum (Huggins & Knight, 1997). The curriculum aims to equip children from different family backgrounds with equal foundational skills and reduce social disparities in their skills development to give them equal chances to academically and socially develop as best as they can (Huggins & Knight, 1997). The first transition within the school system typically occurs between primary and secondary school, often between Grades 4 and 5 (i.e., Primary 4 and 5 in the UK) when children are around 8 to 11 years of age (e.g., in most governmental states of Germany, OECD, 2024; Weinert, Blossfeld, et al., 2024) or between Grades 6 and 7 when children are around 11 to 13 years of age (e.g., in Canada or the United Kingdom, OECD, 2024; Xiong, 2024).

In contrast, secondary schools typically serve pupils who progress from primary education and may be placed into different pathways based on their academic performance, such as routes leading to vocational qualifications or academic qualifications like General Certificate of Secondary Education (GCSEs) and A-levels. In other words, secondary schools are well-positioned to prepare students for diverse post-school pathways, such as vocational training, higher education, or employment through specialisation and targeted guidance (Huggins & Knight, 1997; Weinert, Rossbach, et al., 2024; Xiong, 2024).

Secondary schools mainly cater to adolescents, offering more subject-specific instruction and opportunities for learning (Jindal-Snape et al., 2023; Weinert, Blossfeld, et al., 2024; Weinert, Rossbach, et al., 2024). This division also facilitates the delivery of a more specialised curriculum, with secondary school teachers often having expertise in specific subjects, such as mathematics, sciences, or the arts (Weinert, Blossfeld, et al., 2024; Weinert, Rossbach, et al., 2024). The transition between primary and secondary school reflects significant life changes, which foster social and cognitive development as students encounter new environments, peer groups, and learning expectations (e.g., Jindal-Snape, 2016).

Organisationally, separating an educational pathway into primary and secondary schools allows for better resource management, teacher training, and infrastructure tailored to the distinct needs of each student age group (e.g., Xiong, 2024). The variation in the timing of the transitions reflects different areas' educational philosophies, cultural values, and policy priorities aimed at optimising student development (OECD, 2024; Xiong, 2024).

The Multiple and Multidimensional Transitions (MMT) Theory by Jindal-Snape et al. (2016, 2018, 2023) provides a framework for changes in students and their environments during their transitions to secondary school. This theory conceptualises educational transitions as multidimensional processes shaped by interactions with significant others within an individual's social environment. Jindal-Snape & Rienties (2016) argued that individuals are in a constant state of transition, shaped by experiences, evaluations, and coping strategies developed within cultural, personal, and social contexts. In this transitional state, several developmental theories can be integrated when discussing the changes children encounter: social-emotional changes are illustrated by Erikson's (1959) stages of psychosocial development; cognitive changes are highlighted by Piaget's (e.g., 1928, 1964) theory of cognitive development; and motivational changes which are referenced in several motivational theories (Deci & Ryan, 2000; Eccles & Wigfield, 2020; Elliot, 1997; C. N. Elliott & Story, 2017; Elliott & Dweck, 1988; Ryan & Deci, 2000, 2008, 2020; Wigfield & Eccles, 2000). By integrating theoretical frameworks and empirical evidence, this systematic review aims to provide updated and extended insights into the multifaceted dynamics of the transitions from primary to secondary school, informing interventions and support strategies for educators, parents, and policymakers. Specifically, it addresses the guiding research question: *What social, cognitive, and motivational changes are empirically associated with the educational transitions from primary to secondary school?*

Theoretical Framework

The MMT theory (Jindal-Snape et al., 2018; Jindal-Snape et al., 2020; Jindal-Snape & Rienties, 2016) offers a valuable lens for understanding the social-emotional, cognitive, and motivational changes that may occur during the transitions to secondary school. It posits that children simultaneously navigate multiple transitions across various domains, such as social relationships, emotional well-being, and cognitive demands, as well as across diverse contexts like school and home. These transitions are interconnected and influenced by the experiences of significant others within the child's ecosystem. Unlike Bronfenbrenner's ecological systems theory (Bronfenbrenner, 1986; Bronfenbrenner & Ceci, 1994), which centres the child within a series of nested systems, MMT shifts the focus to the dynamic interactions between the child's ecosystem and those of significant others, highlighting how these interactions evolve and create further changes over time (Jindal-Snape et al., 2020).

The MMT theory aligns with Complexity Theory (e.g., Mason, 2008), recognising that transitions are non-linear and continuously evolving, making it difficult to disentangle the various interrelated factors (Jindal-Snape et al., 2018; Jindal-Snape et al., 2020; Jindal-Snape & Rienties, 2016). This perspective is particularly relevant during the transitions to secondary school, marked by heightened academic expectations, larger peer networks, and new social hierarchies.

Children's starting points for these transitions vary widely, shaped by prior experiences, perceptions of forthcoming challenges, and the presence of protective or risk factors (Jindal-Snape et al., 2018; Jindal-Snape et al., 2020; Jindal-Snape & Rienties, 2016). For instance, some children may adapt positively, drawing on resilience and supportive relationships, while others may struggle, leading to differing social-emotional outcomes. These experiences might

influence how children view their new environments and shape their motivational orientations, such as the development of mastery or performance goals (Wolgast & Keller-Schneider, 2024).

Moreover, the MMT theory (Jindal-Snape et al., 2018; Jindal-Snape et al., 2020; Jindal-Snape & Rienties, 2016) emphasises children's agency in navigating their transitions. As active participants, children can shape their own experiences and those of others by adapting to their environment or altering this environment in ways that contribute to further changes. This participation is critical to understanding how children respond to emotional and cognitive challenges in secondary school (Jindal-Snape et al., 2018; Jindal-Snape et al., 2020; Jindal-Snape & Rienties, 2016). Examples of such challenges include building new peer relationships, adjusting to diverse teaching practices, and managing increased academic demands.

The MMT theory's multidimensional perspective provides a framework for exploring the complex interplay of protective and risk factors during the transitions to secondary school (Jindal-Snape et al., 2018; Jindal-Snape et al., 2020; Jindal-Snape & Rienties, 2016). It highlights the importance of considering children's direct experiences as well as the broader ecosystems that influence their social-emotional and cognitive development, and their motivation to succeed in this new phase of education.

Moreover, developmental and motivational processes are interrelated with educational transitions (Jindal-Snape et al., 2016, 2018, 2023). These developmental and motivational processes are described in classic theories of development and motivation, as outlined next.

Social Changes During the Transitions to Secondary School

Selman's (1981) stages of interpersonal competence development provide a useful framework for understanding the evolving social dimensions of students' transitions to secondary school. His model outlines how children progressively develop decentring and situational social perspective-taking. These skills enable children to interpret and respond to others' viewpoints within complex social contexts. These developmental shifts align with the MMT theory, which emphasises that transitions are not only multiple and multidimensional but also shaped by students' growing capacity to navigate changing interpersonal environments. As students enter secondary school, their ability to engage with diverse social perspectives becomes increasingly important for adapting to new peer dynamics, teacher relationships, and identity-related challenges. He further defined social perspective-taking as the ability to coordinate multiple perspectives, such as one's and another person's intentions, or between oneself and others' intentions (Selman, 1981). Thus, social perspective-taking is a competency usually learned and applied differently depending on the context. As individuals learn, those with typical cognitive development can take a social perspective within different social scenarios appropriately (Epley et al., 2004). This ability functions intuitively in adults and often does not require explicit instruction (Eyal et al., 2018). Social perspective-taking is, together with emotional concern, often assigned to empathy (Wolgast et al., 2019). Empathy is the ability to understand and share the feelings of others (Wolgast et al., 2019).

Selman's (1981) theory outlines general patterns in children's development. However, these typical changes may be influenced by the transitions to secondary school, as students encounter new social contexts and challenges. Students' social-emotional competencies,

including social perspective taking, emotional concern, and the ability to decentre become critical as they navigate more complex social dynamics in secondary school. During these transitions, students often seek to establish new relationships with peers, necessitating advanced social competencies such as empathy.

Building and maintaining social relationships often requires competencies, such as social perspective-taking (Wolgast, 2018), while social competencies can also support cognitive development, as seen in peer learning (Topping, 2011). Integrating Selman's theory into the MMT Theory, students not only aim to form new peer connections but also require social competencies to achieve this goal. The close theoretical relationship between cognitive and social domains suggests a strong interplay between these areas; for instance, students develop situational social perspective-taking and actively engage in social interactions.

Cognitive Changes During the Transitions to Secondary School

Piaget's theory of cognitive development (Piaget, 1928, 1964) outlines distinct stages through which the thinking of children evolves. While the theory itself does not directly address educational transitions, the developmental shifts it describes, particularly the move from concrete operational to formal operational thinking, coincide with the transition to secondary school. This progression reflects the increasing capacity in students for abstract reasoning, hypothesis testing, and metacognition. Within the framework of MMT, these cognitive changes represent a key dimension of adaptation, as students must navigate new academic demands and learning environments that require more complex thought processes.

Neo-Piagetian theorists (Arsalidou et al., 2018; Case, 1974; Demetriou et al., 2002; Greiff et al., 2014; Pascual-Leone, 1970; Pascual-Leone & Baillargeon, 1994) extended Piaget's ideas by integrating concepts from information processing. These theories highlight the importance of working memory capacity and processing efficiency in cognitive development, suggesting that continuous cognitive growth in children is related to the development of these underlying skills (e.g., attention, memory, logical reasoning and problem-solving strategies) that need frequent stimulation to improve. These cognitive skills provide a close lens for understanding the developmental changes that might be interrelated with shifts in the learning behaviour of children during the transitions to secondary school. Metacognition, or the ability to reflect on and regulate individual thinking (Flavell, 1979, 1999; Flavell et al., 1978; Kuhn, 2022; Kuhn & Dean, 2004), becomes increasingly sophisticated during the transitions to secondary school. This includes planning, monitoring progress, and adapting strategies to new learning contexts (Bråten & Samuelstuen, 2007; Efklides, 2011; Labuhn et al., 2010; Wolgast & Barnes-Holmes, 2018).

Transitioning to secondary school can influence the typical cognitive development of children, as students face new academic and social demands. According to the MMT Theory (Jindal-Snape & Foggie, 2008; Jindal-Snape & Miller, 2008), the transitions to secondary school require students to engage in more complex cognitive processes, such as abstract problem-solving and discussing complex problems with significant adults (e.g., parents or teachers). This theoretical proximity of cognitive and social domains suggests again that both domains are interconnected; as students develop their cognitive skills, they also improve their ability to

navigate complex social environments, supporting their overall adaptation to secondary school (Jindal-Snape et al., 2023; Jindal-Snape & Foggie, 2008; Jindal-Snape & Miller, 2008; Schmidt et al., 2019, 2020).

Motivational Changes During the Transitions from Primary to Secondary School

Elliot's motivation theory of achievement goal orientation focuses on how individuals pursue goals related to competence (e.g., Elliot & Church, 1997; Huang et al., 2024; Wigfield & Elliot, 2024). For example, he proposed a distinction between mastery goals, which are aimed at self-improvement and learning, vs. performance goals, which focus on demonstrating competence relative to others. This theory can be integrated into the MMT Theory (Jindal-Snape et al., 2023) alongside the Self-Determination Theory (SDT, Deci & Ryan, 2000; Ryan & Deci, 2008, 2020). For example, students with mastery-approach goals may thrive in learning new skills, understanding complex social interactions, and adapting to secondary school challenges, whereas students with performance-goal orientation might struggle with increased social expectations and peer learning (Wolgast & Keller-Schneider, 2024).

The MMT theory emphasises the interactions between students and their changing contexts. Elliot's theory complements this by describing how achievement-oriented environments (e.g., classrooms prioritising mastery or performance goals) influence students' motivation, engagement, and the outcomes of their transitions. Elliot's theory aligns with MMT theory by considering how goal orientations can evolve during the transitions, influenced by individual experiences and environmental changes, such as moving from nurturing primary school environments to more performance-focused secondary settings.

In addition, students who pursue mastery-oriented goals focus on understanding and improving their skills and knowledge, rather than merely aiming to perform well relative to others (Wolgast & Keller-Schneider, 2024). This type of goal orientation is linked to a genuine interest in the learning process itself and sustained effort in the face of challenges (Huang, 2016; Sommet et al., 2021; Wigfield & Elliot, 2024; Zimmerman et al., 1992). Persistent effort when encountering difficulties is in part a function of self-efficacy, known as a student's belief in their own competence to succeed in specific tasks. Students with high self-efficacy are more likely to approach difficult tasks confidently, persevere through challenges, and ultimately achieve better outcomes, both academically and socially (Gehlbach et al., 2008; Huang, 2016; Schnell et al., 2015).

While SDT (Deci & Ryan, 2000; Ryan & Deci, 2008, 2020) focuses on satisfying autonomy, competence, and relatedness needs, it also provides an appropriate framework for describing motivational changes in students. According to this theory, the fulfilment of the needs for competence, relatedness, and autonomy activates intrinsic motivation in students. Intrinsically motivated individuals engage more effectively and creatively with tasks than those who are motivated by external rewards or pressures (Deci & Ryan, 2000; Ryan & Deci, 2008, 2020). Furthermore, intrinsic motivation is associated with persistence and adaptive problem-solving behaviours in academic tasks (Deci & Ryan, 2000; Ryan & Deci, 2008, 2020). Intrinsically motivated work is often of higher quality and correlates with greater well-being and mental health compared to tasks that lack intrinsic motivation (Deci & Ryan, 2000; Ryan & Deci, 2008,

2020). These theories, integrated into the MMT theory, provide a more comprehensive framework for examining the interplay between dynamic personal motivation and changing external demands during transitions. In line with that, the MMT theory highlights that transitions are dynamic processes.

The anticipated and experienced transitions to secondary school (Hallinan & Hallinan, 1992; McGee et al., 2015) significantly impact students' academic motivation, as well as their academic and social learning (Spernes, 2022; West et al., 2010), as implied by the MMT Theory (Jindal-Snape et al., 2016, 2018, 2023). Figure 1 illustrates how social, cognitive, and motivational changes during the transition to secondary school are embedded within the broader framework of MMT. It shows how individual development interacts with environmental shifts, such as new peer groups, academic demands, and school structures, highlighting the dynamic interplay between students' internal growth and external changes. The integration of key developmental theories within this model aims to clarify how these dimensions collectively shape students' transition experiences.

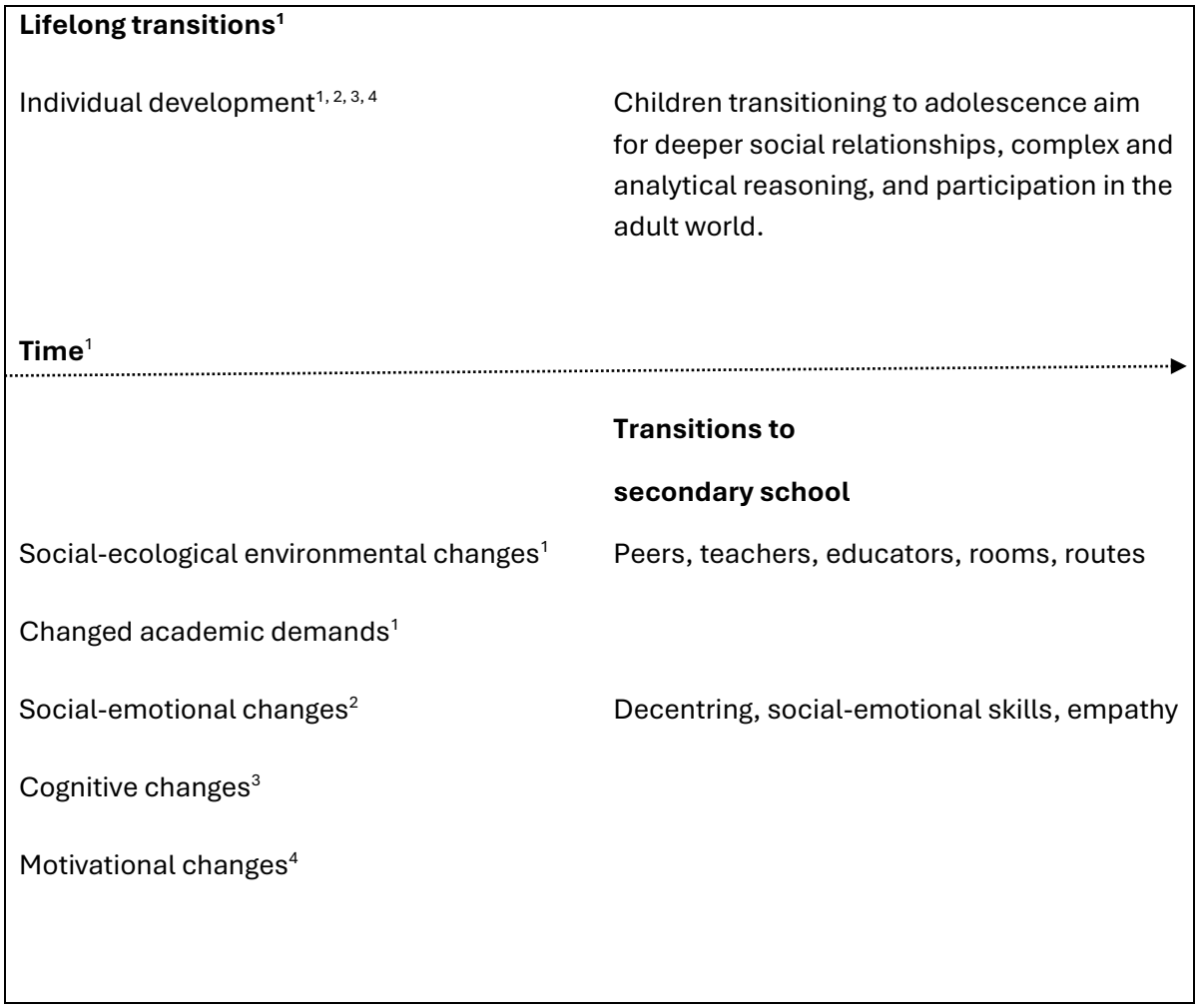


Figure 1. Theoretical Model of Social ([2]Selman, 1981), [3]Cognitive (Flavell, 1999; Kuhn, 2000; Piaget, 1928, 1964), and Motivation ([4]Deci & Ryan, 2000; Elliot & Church, 1997; Ryan & Deci, 2020; Wigfield & Elliot, 2024) Changes During the Transitions to Secondary School (based on the MMT theory, [1]Jindal-Snape & Rienties, 2016).

The Current Systematic Review

Research findings indicate that students transitioning to secondary school often experience a decline in mastery goal orientation and an increase in performance goal orientation (e.g., (Anderman & Midgley, 1997; Anderman & Anderman, 1999; Fischer & Theis, 2014; Weinert, Blossfeld, et al., 2024; Weinert, Rossbach, et al., 2024). This shift is thought to result from a misalignment between students' developmental needs and the demands of their new educational setting (Eccles & Wigfield, 2020a). Classroom goal structures further shape motivation, with teaching practices and learning atmospheres that prioritise either mastery or performance orientations significantly influencing students' focus and engagement (Roeser et al., 1996; Weinert, Blossfeld, et al., 2024; Weinert, Rossbach, et al., 2024).

The MMT theory (Jindal-Snape & Rienties, 2016) provides a valuable lens to contextualise these changes as simultaneous, interconnected experiences occurring across multiple domains, such as social, cognitive, and motivational. These transitions are shaped by interactions within and between the ecosystems of the child and significant others, such as peers, teachers, and family members. The MMT framework helps explain how the complexity and dynamics of the educational transitions, shaped by both protective and risk factors, can lead to variability in students' motivational trajectories.

Building on these theoretical insights, the research question guiding this systematic review is:

> *What social, cognitive, and motivational changes occur during the educational transitions from primary to secondary school, and how do these changes interact within the framework of the MMT theory?*

First, we expected (Hypothesis 1) that students further develop their decentred thinking, positive perceived social relationships, and empathy (i.e., emotional concern and social perspective taking) on their transitions to secondary school and subsequently. Our second assumption (Hypothesis 2) was that students who transitioned to secondary school would indicate increased analytical abstract reasoning and more sophisticated information processing than before the transitions. Third, we assumed (Hypothesis 3) that students who transition to secondary school and experience autonomy, competence, and relatedness indicate academic motivation.

We followed the PRISMA reporting guidelines (Page et al., 2021). We preregistered the research question, the hypotheses, exclusion and inclusion criteria at https://osf.io/8kgmr/?view_only=78d0a4e833514bd3ba6d3f7bdf1ae72d. The exclusion criteria were as follows: studies published before 2020; studies that do not focus on student educational transitions, their perspectives, or fail to address social, cognitive, or motivational changes; and studies employing methodologies outside of correlation designs, case studies, or experimental approaches, as well as grey literature (i.e., reports, theses and dissertations, conference proceedings, government documents, white papers, policy briefs, clinical trial registries, institutional repositories, and preprints). These exclusions ensured the relevance of the included studies, upheld methodological consistency, and contributed to the overall rigour and quality of the review. The corresponding inclusion criteria for the review were as follows: studies published from 2020 onwards that focus on student educational transitions, their

perspectives, and address social, cognitive, or motivational changes; and those employing correlation designs, case studies, or experimental methodologies. These criteria ensured a relevant and methodologically diverse evidence base for the analysis.

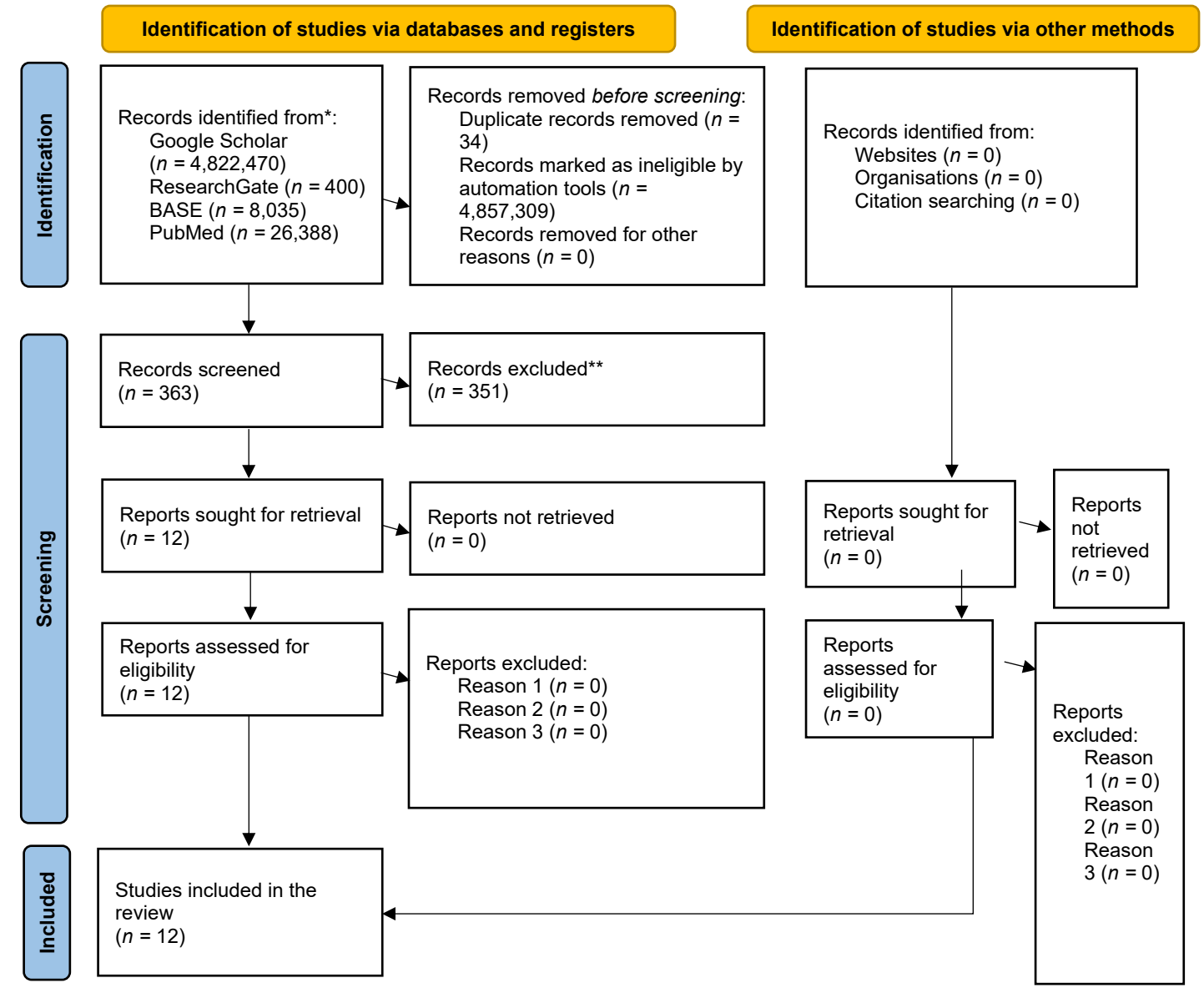
Methods

The current systematic review focused on literature covering social, cognitive, and motivational changes during student transitions to secondary school. Since previous reviews (e.g., Jindal-Snape et al., 2020) partially covered the current preregistered research question, the relevant time frame for the current review concerned empirical studies between 2020 and 2024 to provide a meaningful update and contribution to the research. Inclusion criteria: Correlational and experimental studies were included in the systematic review. We used the following four databases to search for literature, each researcher independently from each other: Google Scholar, Base Search, ResearchGate, PubMed.

The search terms always covered students' social, cognitive, or motivational changes during transitions and were as follows: "social changes educational transitions", "cognitive changes educational transitions", and "motivational changes educational transitions". Where available, the filter by publication date was used for the respective search engines to directly exclude literature before 2020.

Following the selection of the search terms, the selection of the literature began using the preregistered databases. The literature selection was initially carried out by screening the titles and was stopped as soon as the database offered no more hits regarding transitions over further pages. Further screening of the studies was then carried out using the abstracts of the individual studies to check that the studies dealt with one of the three areas examined. To ensure a high degree of objectivity in this process, another group of researchers helped to classify the included studies. This group only knew the inclusion criteria and ensured additional blinding. This prevented possible confirmation bias, which could go hand in hand with knowledge of the hypotheses. Figure 2 presents the flow diagram with details at each selection stage. Subsequently, the relevant findings from the included studies were structured as presented in Table 1 and summarised to address the current hypotheses and research question.

Figure 2. PRISMA 2020 Flow Diagram for the Current Systematic Review (Page et al., 2021).



From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71. For more information, visit: http://www.prisma-statement.org/

Table 1

Overview of results regarding the current research question (sorted by publication year)

	Authors	**Country (*N/n* students)**	**Students' years of age at T1**	**Transition grades**	**Main results on social changes**	**Main results on cognitive changes**	**Main results on motivational changes**
1	(Röder & Müller, 2020)	Germany (144)	8–11	4–5	Empathy and aggression were strongly related to perceiving the impending transition as challenging: victimisation and peer acceptance related to the perception of the transition as a threat.	---	---
2	(Smith et al., 2020)	Canada	11–13	6 to 7	Social relationships	---	On average, the students' expectations for success

	Authors	Country (*N/n* students)	Students' years of age at T1	Transition grades	Main results on social changes	Main results on cognitive changes	Main results on motivational changes
		(323)			appeared to be a protective factor for students' motivation to learn, during their transition		and the value of learning declined. Positive relationships with peers and the teacher before the transition related to relatively positive trajectories of these expectations and the value of education.
3	(Tuominen et al., 2020)	Finland (419)	12–13	6 to 7	---	Students with a mastery-oriented profile across the transition reported an adaptive pattern of academic achievement.	Four goal-orientation profiles were identified (stably over time): indifferent, success-oriented, mastery-oriented, and avoidance-oriented. Likely transitions were from success-oriented to indifferent and from indifferent to avoidance-oriented. Many students' motivation changed to less favourable motivational

	Authors	Country (*N/n* students)	Students' years of age at T1	Transition grades	Main results on social changes	Main results on cognitive changes	Main results on motivational changes
							profiles. However, those with a mastery-oriented profile across the transition were assigned to the most adaptive pattern of motivation.
4	(Zimina, 2021)	Russia (261)	10	4 to 5	The students reported that new and largely unpredictable social relationships replaced established and understandable relationships with the emergence of conflict behaviour. The growth of	There was a significant increase in the development of subject-related knowledge, conceptual and abstract reasoning.	In Grade 5, the students' motivation decreased.

Authors	Country (*N/n* students)	Students' years of age at T1	Transition grades	Main results on social changes	Main results on cognitive changes	Main results on motivational changes
				independence leads to an increase in the desire to receive the approval of classmates, which indicates, rather, the desire to look independent in front of others than the inner state of independence. In general, the obtained result corresponds to the existing ideas about the experience of adolescent crisis.		

	Authors	Country (*N/n* students)	Students' years of age at T1	Transition grades	Main results on social changes	Main results on cognitive changes	Main results on motivational changes
5	(Raufelder et al., 2022)	Finland (1,073)	11–12	6 to 7	-	Students with a "struggling ambitious" profile had the highest test scores of fluid intelligence, math, and literacy.	The probabilities of staying in the same profile during the transition were relatively high for three motivational patterns: "disengaged strained" with "low motivation and high cost", "disengaged relaxed" with "low motivation and low cost", and "struggling ambitious" with "high motivation and high cost". Students with the profile "positively engaged" with „high motivation and low cost" were more likely to change to one of the "disengaged" profiles.
6	(Jindal-Snape et al., 2023)	United Kingdom (2,559)	11	6 to 7	The results suggested students' good peer relationships		High levels of overall motivation for schoolwork maintained. However, students' enjoyment and engagement were lower at

	Authors	Country (*N/n* students)	Students' years of age at T1	Transition grades	Main results on social changes	Main results on cognitive changes	Main results on motivational changes
					and perceived decline in bullying, however, also the decline in relationships with teachers, the more negative attitudes towards English and maths and school in general, and the decline in engagement and enjoyment		secondary school than at primary school.
7	(De Moor et al., 2023)	Netherlands (241)	10–12	8 to 9	---		Especially students' engagement in exploration in breadth regarding their

	Authors	Country (*N/n* students)	Students' years of age at T1	Transition grades	Main results on social changes	Main results on cognitive changes	Main results on motivational changes
							education decreased across the transition.
8	(Geukens et al., 2023)	Belgium (274)	9–11	6 to 7	Students' perceived loneliness decreased across the transition from primary to secondary school.		
9	(Herrero-Hernández et al., 2023)	Spain (168)	---	---	Many students would like to meet their future teachers and tutors already at primary school. They believed that they would relatively easily make friends, that their	---	---

	Authors	Country (*N/n* students)	Students' years of age at T1	Transition grades	Main results on social changes	Main results on cognitive changes	Main results on motivational changes
					families would support them less in secondary school activities, and associated happiness with the transition.		
10	(Ratelle et al., 2023)	Canada (639)	10–12	6 to 7	---	The low-satisfaction profile determined poorer outcomes than other profiles.	Four latent transition analysis profiles – identical characteristics and prevalence across the school transition: Globally High, Reduced Competence, Reduced Autonomy, and Low Satisfaction. Decreases in psychological needs satisfaction across the transition to secondary

	Authors	Country (*N/n* students)	Students' years of age at T1	Transition grades	Main results on social changes	Main results on cognitive changes	Main results on motivational changes
							school were less prevalent than in previous research.
11	(Zhang et al., 2023)	Germany (1764)	9–11	4 to 5	---	A mastery-oriented profile (vs. a high multiple profile or a low mastery profile) at the end of primary school predicted higher German grades one year and two years after transitioning to secondary school even after controlling for their prior achievement and basic cognitive abilities.	Moreover, the sustained beneficial effects of a mastery-oriented profile (vs. a low mastery profile) on students' achievement gains can be explained by their higher joy of learning.
12	(Pfost et al., 2024)	Germany (293)	9–11	4 to 5		Students who transitioned to academic track schools had higher competence gains than students who transitioned to vocational track schools (interestingly, an inverse pattern was found for vocabulary development). Controlling for Grade 4 vocabulary, spelling, reading comprehension, mathematics, reading self-concept, parents' education, and ethnicity, a	Studying the development of goal regulation beyond the first years of secondary school, an increase in mastery goal orientation occurred especially for students who transitioned to vocational track schools. This increase was related to a better stage-

Authors	Country (*N/n* students)	Students' years of age at T1	Transition grades	Main results on social changes	Main results on cognitive changes	Main results on motivational changes
					small positive effect of attending academic track school on reading comprehension was disclosed.	environment fit and changes in the goal structure of the new learning environment.

Results

Table 2 presents the countries the reviewed studies reported on, the primary school grade children transition to secondary school, and the typical age for evident developmental transitions (Bray & Jiang, 2014; Commission, 2019; European Commission, 2022; Mumford & Birchwood, 2021; UNESCO, 2021). Clearly, differences between countries exist in these formal transitions to secondary school. In Table 2, the relevant results to answer the current research question are summarised, sorted by publication year. In the included studies, *n* = 8,158 students from eight countries indicated their anticipated changes and experiences during their transitions to secondary school.

Social Changes

Hypothesis 1 was that, following the transitions to secondary school, students indicate decentred thinking, positive perceptions of social relationships, and empathy, including emotional concern and social perspective-taking. Herrero-Hernández et al. (2023) found that many students expressed a desire to meet their future teachers and tutors before starting secondary school, believing it would facilitate social connections. They anticipated relatively easy friendships, expected less family support for secondary school activities, and associated the transitions with feelings of happiness and excitement (Herrero-Hernández et al., 2023). Additionally, Zimina, (2021) described an increase in the desire for peer approval following the transitions. These findings of anticipated social interactions during and following transitions suggest decentred thinking.

Jindal-Snape et al. (2023) presented positive peer relationships among students and a perceived decline in bullying following the transitions to secondary school. High empathy levels and low or no perceived aggression related to students' perceptions of the impending transitions as a positive challenge, whereas experiences of victimisation and low levels of peer acceptance were linked to viewing the transitions as a threat (Röder & Müller, 2020). Other researchers described a reduction in perceived loneliness during the transitions (Geukens et al., 2023). Thus, the findings (Geukens et al., 2023; Herrero-Hernández et al., 2023; Jindal-Snape et al., 2023; Zimina, 2021) support Hypothesis 1.

Positively perceived social relationships emerged as a protective factor for student motivation to learn during transitions (Smith et al., 2020). However, students reported that established and predictable relationships had often been replaced by new, largely unpredictable social dynamics, which sometimes led to conflict (Zimina, 2021). More specifically, students experienced a decrease in their relationships with teachers (Jindal-Snape et al., 2023).

Cognitive changes

Hypothesis 2 stated that after transitioning to secondary school, students demonstrate increased analytical and abstract reasoning, as well as more sophisticated information processing skills than before the transitions. The reviewed studies indicated that students with a mastery-oriented profile throughout the transitions exhibited an adaptive pattern of academic achievement (Tuominen et al., 2020), while other students demonstrated significant gains in subject-related knowledge, conceptual reasoning, and abstract reasoning (Zimina, 2021). These findings support Hypothesis 2.

Further results (Raufelder et al., 2022) suggested that students with a “struggling ambitious” (high motivation, high cost) profile achieved the highest test scores in fluid intelligence, mathematics, and literacy. In another study (Zhang et al., 2023), a mastery-oriented profile at the end of primary school was a strong predictor of higher grades in German, one - and two years post-transitions, even after accounting for previous achievement and basic cognitive abilities.

Pfost et al. (2024) summarised that those students transitioning to academic track schools reached higher gains in competence than those moving to vocational track schools, although the reverse trend was observed in vocabulary development. Controlling for Grade 4 vocabulary, spelling, reading comprehension, mathematics, reading self-concept, parental education, and ethnicity, a modest positive effect of attending an academic track school on reading comprehension was identified (Pfost et al., 2024). Most of these additional results serve rather as proxies for analytical and abstract reasoning, as well as for more sophisticated information processing skills, rather than indicating explicit cognitive changes in these skills during transitions. These results were often associated with students’ motivation.

Motivational Changes

Hypothesis 3 concerned student motivation, specifically, that student experiences of competence, relatedness, and autonomy were key factors in their academic motivation following the transitions to secondary school. Zimina et al. (2021) described student motivation as declining following transitions to Grade 5 at secondary school.

Raufelder et al. (2022) presented high stability in three profiles: “disengaged strained” (low motivation, high cost), “disengaged relaxed” (low motivation, low cost), and “struggling ambitious” (high motivation, high cost). Students who initially had a “positively engaged” profile (high motivation, low cost) tended to transition towards one of the disengaged profiles, indicating a challenging motivational shift for some (Raufelder et al., 2022).

Other students exhibited declines in their expectations for success and the perceived value of learning (Jindal-Snape et al., 2023). However, students who had positive relationships with peers and teachers before the transitions were more likely to experience favourable trajectories. Further researchers (Tuominen et al., 2020) identified four stable goal-orientation profiles: indifferent, success-oriented, mastery-oriented, and avoidance-oriented. Transition patterns indicated that students were likely to shift from success-oriented to indifferent profiles, and from indifferent to avoidance-oriented profiles, with many experiencing declines in motivation. However, students maintaining a mastery-oriented profile across the transitions exhibited the most adaptive motivational patterns (Tuominen et al., 2020).

A mastery-oriented profile continued to indicate beneficial effects on achievement gains, likely due to a sustained joy of learning (Zhang et al., 2023). Furthermore, students transitioning to vocational track schools exhibited increased mastery goal orientation over time, suggesting a better alignment with the vocational environment. This alignment fostered growth in motivation through changes in the goal structure of the new learning setting (Pfost et al., 2024). Moreover, students reported more negative attitudes towards subjects such as English and mathematics, as well as towards school overall, along with decreased engagement and enjoyment (Jindal-

Snape et al., 2023). Furthermore, the overall motivation of students for schoolwork remained high, even though students reported lower enjoyment and engagement in secondary school than in primary school (Jindal-Snape et al., 2023), particularly in exploratory learning (De Moor et al., 2023).

Four consistent latent profiles—Globally High, Reduced Competence, Reduced Autonomy, and Low Satisfaction—were identified across the transitions, with decreases in psychological needs satisfaction being less widespread than previous studies suggested (Ratelle et al., 2023). Students with a Low-Satisfaction profile experienced poorer academic outcomes compared to those in other profiles (Ratelle et al., 2023). Thus, research during the reviewed period often focused on dimensions of academic motivation based on Elliot's multi-dimensional motivation approach rather than on self-determination theory, which emphasises the basic needs of competence, relatedness, and autonomy in school settings.

Table 2

Country, Primary School Grade at Transitions, and Typical Age and Developmental Transitions in the Reviewed Studies

Country	**Primary School Grade to Transitions to Secondary School**	**Typical Age and Developmental Transitions** (Byrnes & Dunbar, 2014; Goddu & Gopnik, 2024)
Belgium	6	11: By age 12, they are more capable of reflecting on their thoughts and may begin to experience more complex reasoning, often tied to social feedback and academic performance.
Canada	6	11
Finland	6	11
Germany	4 or 6 (depending on the governmental state)	9 or 11: at nine years of age, they start developing the ability to understand multiple perspectives and solve problems logically. By age 10, peer relationships take on greater importance, with children increasingly valuing social acceptance and belonging.
Netherlands	8	11
Russia	4	10: This age also marks the beginning of heightened self-awareness and empathy, as they engage in more complex social interactions.
Spain	6	12: Many adolescents express signs of formal operational thinking, where they can engage in

Country	Primary School Grade to Transitions to Secondary School	Typical Age and Developmental Transitions (Byrnes & Dunbar, 2014; Goddu & Gopnik, 2024)
		more hypothetical and abstract reasoning, thinking about possibilities and future scenarios beyond their immediate experience
United Kingdom	6	11

(Bray & Jiang, 2014; Commission, 2019; European Commission, 2022; Mumford & Birchwood, 2021; UNESCO, 2021)

Discussion

This systematic review aimed to test a theoretical model of social, cognitive, and motivational changes in students during their transitions to secondary school, grounded in the MMT theory (Jindal-Snape & Rienties, 2016), with theories of these changes integrated (Deci & Ryan, 2000; Flavell, 1999; Kuhn, 2000; Selman, 1981; Wigfield & Elliot, 2024). The MMT framework conceptualises transitions as dynamic, multidimensional processes shaped by interactions within and between the ecosystems of the child and significant others. This perspective was instrumental in interpreting the findings across the reviewed studies.

Social Changes and Student School Motivation

Socially, the transitions were marked by shifts in peer dynamics and teacher–student relationships, which the MMT theory frames as interdependent changes across personal and contextual domains. The emergence of empathy and decentred thinking among students reflects the theory's emphasis on evolving social competencies shaped by relational experiences. The weakening of teacher relationships and the rise in peer validation needs illustrate how students' agency and adaptation are influenced by their social ecosystems, consistent with MMT's view of reciprocal change.

The results of this systematic review support hypothesis 1, indicating that students showed decentred thinking, positive perceptions of social relationships, and empathy following transitions to secondary school. Notably, empathy was closely related to the perception of the transitions as a positive challenge (Herrero-Hernández et al., 2023). Perceived aggression, on the other hand, was related to the perception of the transitions as threatening (Jindal-Snape et al., 2023). The perception of a threat typically activates negative emotions. Negative emotions are predictors of social withdrawal of students and lower academic achievement compared to those without these negative emotions (Bar-Haim et al., 2007). Given the further finding that social relationships emerged as a protective factor, the question arises as to whether students who perceive aggression may experience social relationships as protective or more threatening (Bar-Haim et al., 2007).

According to the reviewed studies, positively perceived social relationships bolstered students' motivation to learn during their transitions to secondary school (Smith et al., 2020; Tuominen et al., 2020). Nevertheless, the transitions often disrupted established and familiar social connections, replacing them with new, unpredictable dynamics that sometimes led to conflict from the students' points of view (Jindal-Snape et al., 2023; Zimina, 2021).

Additionally, the increased desire for peer approval observed among students highlighted a focus on maintaining the appearance of social independence rather than experiencing true social autonomy (Zimina, 2021). This is consistent with developmental research describing adolescent metacognition and self-monitoring, where students navigate with social identity and the need for peer validation, and explore new strategies in peer learning (Flavell, 1979; Kuhn, 2022; Kuhn & Dean, 2004; Wolgast & Barnes-Holmes, 2018; Wolgast & Keller-Schneider, 2024).

The current systematic review also found mixed results in terms of students' social and academic experiences. Many students expressed a desire to meet their future teachers and tutors while still in primary school, believing that such early introductions could facilitate their social adjustments (Herrero-Hernández et al., 2023). However, as students moved on to secondary school, their social relationships with teachers weakened. This shift was accompanied by the development of more negative attitudes towards academic subjects, such as English and mathematics, and towards school in general (Jindal-Snape et al., 2023). These changing attitudes corresponded with a decrease in engagement and enjoyment (Jindal-Snape et al., 2023), indicating potential areas of concern for educators and policymakers aiming to support students' sustained academic motivation. Students' feelings of loneliness decreased during the transitions, despite the weaker connections to teachers (Geukens et al., 2023; Jindal-Snape et al., 2023). This may be explained by the finding that pupils' positive peer relationships were largely maintained, with a reported decline in perceived bullying (Jindal-Snape et al., 2023). These findings also support the argument that individual life domains are interrelated, such as students' social lives at school, including social relationships with teachers, and the students' academic motivation at school (Flavell, 1979; Kuhn, 2022; Kuhn & Dean, 2004; Wolgast & Barnes-Holmes, 2018; Wolgast & Keller-Schneider, 2024).

The reviewed studies did not provide direct evidence on the relationship between students' social cognition and the cognitive competencies expected in secondary school. For example, social perspective-taking is the cognitive capacity for a flexible mental model of social situations. It is necessary for appropriate behaviour in various social situations in school (e.g., peer learning).

Cognitive Changes and Achievement Motivation

Cognitively, the development of abstract reasoning and metacognitive skills aligns with the MMT theory's recognition of transitions as catalysts for growth across multiple domains. The interplay between cognitive development and motivational profiles, particularly mastery orientation, demonstrates how internal capacities and external demands co-evolve. The MMT framework helps explain how students' cognitive adaptations are not isolated but embedded within broader social and motivational contexts.

Several of the studies reviewed indicated that students' cognitive changes were related to their motivation or motivational profiles, and that the transitions to secondary school were associated with relationships between achievement motivation and cognitive achievements (Pfost et al., 2024; Ratelle et al., 2023; Raufelder et al., 2022; Tuominen et al., 2020; Zhang et al., 2023; Zimina, 2021). Specifically, students showed improvements in analytical and abstract reasoning and demonstrated more sophisticated information processing skills (Zimina, 2021). This aligns with the expectations of cognitive development theories that predict a shift towards formal operational thinking as students progress through adolescence, and with educational standards (e.g., education levels according to the ISCED 2011 classification, UNESCO, 2021).

Motivationally, the review found that students' experiences of competence, autonomy, and relatedness were central to their academic engagement. The MMT theory's emphasis on the dynamic interaction between individual needs and environmental structures provides a lens through which to understand the variability in motivational trajectories. The decline in mastery orientation and rise in performance goals observed in several studies reflect the tension between students' developmental needs and the demands of secondary school settings.

The observed adaptive pattern of academic achievement among students with a mastery-oriented profile highlights the importance of motivation and mindset in navigating academic transitions (Tuominen et al., 2020). Mastery-oriented students experienced significant gains in subject knowledge, conceptual understanding, and abstract reasoning (Zhang et al., 2023), highlighting the value of a growth-oriented approach in facilitating academic success. This finding supports previous literature suggesting that mastery-oriented goals foster sustained effort in the face of academic challenges (Montano, 2024), which is especially pertinent during transitions to more demanding educational environments.

Interestingly, students identified with a "struggling ambitious" profile achieved the highest scores in fluid intelligence, mathematics, and literacy (Raufelder et al., 2022). This finding points to a complex relationship between mastery-goal orientation, sustained effort, and academic outcomes. Conversely, students with a low satisfaction profile experienced poorer outcomes (Ratelle et al., 2023), reinforcing the notion that their satisfaction might be linked to academic and social experiences at school (e.g., decreased connections to teachers, Jindal-Snape et al., 2023).

The predictive value of a mastery-oriented profile at the end of primary school on subsequent academic performance in secondary school provides further evidence of the significance of early motivational profiles (Zhang et al., 2023). These findings suggest that fostering a mastery orientation before transitions may have long-term benefits, particularly in critical subjects such as German. Furthermore, students who transitioned to academic track schools achieved greater gains in competence than those on vocational tracks (Pfost et al., 2024), highlighting the role of academic pathways in shaping cognitive and academic development.

However, the inverse pattern found in vocabulary development indicates that certain skill areas may benefit differently from academic versus vocational tracks (Pfost et al., 2024), which

warrants further investigation. These findings imply interrelations between motivation and cognitive development that are moderated by academic track education during the transitions to secondary school. Furthermore, the findings suggest that supporting students' cognitive growth through targeted interventions that address both motivation and academic orientation may help to promote smoother transitions and more positive educational trajectories and long-term benefits.

Moreover, Tables 1 and 2 illustrate that the age at which students transition to secondary school varies considerably across national contexts. These structural variations may influence the extent to which students experience challenges or growth in social relationships, abstract reasoning, and motivational orientation. For example, earlier transitions may coincide with less developed metacognitive or social-emotional competencies, potentially amplifying adjustment difficulties. Conversely, later transitions may align more closely with developmental readiness, facilitating smoother adaptation. Integrating these systemic differences into future research could help clarify how educational structures shape the nature and outcomes of students' transitions. While this review does not aim to compare systems directly, such variation may influence developmental readiness and the nature of social, cognitive, and motivational changes observed, warranting further exploration in future comparative research.

Conclusion

Socially, the transitions involve shifts in peer dynamics, teacher–student relationships, and the broader school environment. These social changes influence students' social interactions, as well as their interactions with teachers at secondary school. The findings suggest that the social changes might moderate students' social learning, including emotional concern and perspective-taking (empathy) through increased exposure to various peer groups and new social contexts. This process, known as cognitive decentring, enables students to consider multiple perspectives and enhances their ability to behave appropriately and socially desirable in complex social situations (Selman, 1981; Epley et al., 2004; Wolgast et al., 2019).

However, the extent of these moderation effects on the differential developmental patterns of the empathy dimensions of emotional concern and perspective-taking remains an open question for further research. Social perspective-taking is an apparent protective factor regulating emotional responses and potentially stressful experiences under emotional concern, especially in the cognitive empathy dimension. In contrast to the cognitive skill of social perspective-taking, emotional concern was consistently associated with physiological and subjective distress (Bar-Haim et al., 2007; Wolgast et al., 2019).

Cognitively, students are challenged by the increased academic demands and expectations of secondary school, which necessitate the development of advanced analytical and abstract learning competencies. The transitions stimulate higher-order cognitive processes, such as analysis, synthesis, and evaluation, as students engage with more complex and voluminous information (Piaget, 1928, 1964; Flavell, 1979, 1999; Kuhn, 2022). These findings align with the developmental shift toward formal operational thinking and support the notion that transitions can foster cognitive growth when supported by mastery-oriented environments (Tuominen et al., 2020; Zhang et al., 2023).

Motivationally, students' needs for competence, relatedness, and autonomy emerge as critical factors for their achievement motivation during these transitions (Deci & Ryan, 2000; Ryan & Deci, 2008, 2020). The results of Hypothesis 3 imply interrupted relatedness experiences, reduced competence experiences in academic track schools, and reduced autonomy in terms of choices between academic tasks associated with low achievement motivation. This implication suggests a likely decline in achievement motivation during secondary school transitions, a finding that is reflected in the reviewed studies (Raufelder et al., 2022; Ratelle et al., 2023).

Almost all the reviewed studies provided evidence of the multidimensional patterns of motivation with a strong focus on goal orientations and their consistently evident relations to academic outcomes such as vocational vs. academic track education and school grades (Elliot & Church, 1997; Wigfield & Eccles, 2000; Zhang et al., 2023). However, supportive social and physical environments that address these psychological needs, fostering intrinsic motivation, engagement, and well-being, may buffer factors that reduce achievement motivation (Deci & Ryan, 2000; Ryan & Deci, 2020).

Importantly, this review found that students' experiences were more positive than previous syntheses have suggested, particularly in terms of peer relationships, reduced aggression, and sustained motivation in vocational tracks (Jindal-Snape et al., 2023; Geukens et al., 2023; Pfost et al., 2024). These findings underscore the potential for targeted interventions that leverage social support, cognitive engagement, and motivational scaffolding to promote smoother transitions.

Fostering positive transitions is essential for promoting students' basic motivational needs, academic goal orientations, well-being, and lifelong learning for students (Bagnall et al., 2023; Jindal-Snape et al., 2018, 2023; Jindal-Snape & Miller, 2008). Understanding these changes is crucial for educators, parents, and policymakers to facilitate smoother transitions and promote positive outcomes for students.

Integration of Findings: In synthesising the findings across the studies, several key themes emerge. First, transitions to secondary school are multifaceted processes influenced by individual, interpersonal, and contextual factors. Second, while adaptation is common, the extent and nature of students' experiences vary considerably. Third, interventions that focus on social support, cognitive engagement, and basic motivational needs hold promise for facilitating smoother transitions and promoting positive outcomes.

Implications and Future Directions: This review highlights the importance of holistic approaches to supporting students during their transitions from primary to secondary school. Interventions should address academic needs as well as social-emotional, well-being, and motivational factors. In addition, future research could explore longitudinal adjustment trajectories and identify protective factors that buffer against challenges during this transition. Moreover, research regarding the cognitive changes during the primary-secondary transitions should be expanded, as existing studies are limited. By understanding the social, cognitive, and motivational changes inherent in these educational transitions, stakeholders can better equip students to explore their new academic environments.

Limitations

The limitations of the review are the small amount of literature found with the previously established inclusion criteria. Furthermore, an additional hypothesis and theoretical model of emotional changes would have had great potential for further findings. Research findings on students' transitions from more countries could have given valuable insights into transitions in different educational systems. Such findings would have allowed for comparisons of students who have to transition to secondary school and those who do not need to since the educational system provides a single school type for pupils and students in academic track education

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