

# **Dynamics of Motivation, Self-Regulation, and Feedback in Greek Adolescents' Academic Achievement: A Mixed-Methods Study**



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## **Declaration**

This thesis is the result of my own work and includes nothing which is the outcome of work done in collaboration except as declared in the preface and specified in the text. It is not substantially the same as any work that has already been submitted, or, is being concurrently submitted, for any degree, diploma or other qualification at the University of Cambridge or any other University or similar institution except as declared in the preface and specified in the text. It does not exceed the prescribed word limit for the relevant Degree Committee.

## Abstract

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Academic achievement is considered important for attaining a greater socio-economic position and societal prosperity. Yet, the academic achievement of Greek adolescents is declining in the last decades according to international student assessment surveys. Hence, the present dissertation is a mixed-method non-sequential multi-study examining the interplay between motivational, self-regulatory, and contextual factors that underpin the academic achievement in Greek adolescents. Drawing upon the social-cognitive theory, the cyclical and the metacognitive and affective models of self-regulated learning, a conceptual model of factors and processes underpinning the academic achievement of Greek adolescent students was built and tested. Three empirical studies were designed and conducted to address the overarching research question: What student-level and contextual factors are critical for academic achievement among adolescent students in Greece, and in what ways do these factors contribute to their success?

Study 1 involved a secondary data analysis of the large nationally representative data ( $n=5,532$  students,  $n=211$  schools) from the PISA survey. The aims were to explore how students' motivational beliefs (i.e., self-efficacy, intrinsic and extrinsic motivation, and performance goal orientation) were associated amongst themselves, with teachers' feedback and achievement. Multilevel structural equation modelling (students nested in schools) was deployed. The results indicated that that the association between feedback and achievement was partially mediated by the complex network of associations between students' motivational beliefs. The quantity of teachers' feedback positively predicted students' self-efficacy, intrinsic and extrinsic motivation, but did not predict performance goals. The effect of feedback was further propagated through self-efficacy. Students'

intrinsic motivation (enjoyment and interest), self-efficacy, and performance goals positively predicted academic achievement, whereas extrinsic motivation had a small negative effect. This revealed that extrinsic motivation had an undermining effect despite the positive bivariate correlation. Peculiarly, students who received more frequent feedback had worse academic achievement, suggesting that either the quantity of feedback was not helpful or that students were not able to accurately process the feedback message.

In Study 2, a person-centred approach was adopted to explore the higher-order interactions between students' academic motivational beliefs and metacognitive self-regulation through a survey in secondary schools. The motivation for Study 2 was to examine potential negative interactions, whereby some students might score high in motivation but low on metacognitive self-regulation, or the reverse. Latent profile analyses of 1,046 Greek adolescent students ( $n=19$  schools) revealed three well-defined profiles of motivated metacognitive self-regulation ranging from minimally motivated and metacognitively self-regulated to exceptionally motivated and metacognitively self-regulated. No negative interactions were identified, suggesting that motivation and metacognitive self-regulation act synergistically across the spectrum of individual differences. Positive correlations were identified across profiles between motivational factors and metacognitive self-regulation, suggesting that teachers could identify students who are struggling to be capable metacognitive self-regulators by their dropping levels of motivation. Substantial achievement differences were found between profiles. Greater socio-economic status and speaking Greek as the main language at home were significant protective factors against being minimally motivated and metacognitively self-regulated.

Surprisingly, older students had greater chances of being less motivated and metacognitively self-regulated.

Finally, Study 3 was a qualitative study consisting of 16 semi-structured face-to-face interviews ( $n=7$  schools) with adolescent students. Computer-assisted abductive thematic analysis confirmed the emergence of three global factors that underpin students' academic achievement, namely internal factors (motivation and metacognitive self-regulatory strategies), relational factors (teachers, parents, peers), and structural factors (the educational system through its assessment practices). Abductive thematic network analysis was deployed to theorise about the links between these factors suggesting that students had acquired a good level of self-regulated learning strategies and displayed a mix of motivational beliefs. From the students' responses, it was hard to distinguish between different motivational beliefs; that is, students appeared to be both intrinsically and extrinsically motivated and hold high levels of self-efficacy. Teachers' feedback and exam stress appeared problematic for students' academic achievement, though the students recognised the importance of exams. The students raised awareness to a phenomenon called 'grade inflation', whereby teachers did not grade students objectively. Short-term parental educational expectations did not appear to be linked with students' perceived motivation to perform better. The role of peers was rather complicated, with the students using their classmates as achievement comparison standards, whereas their friends could serve as distractors.

In brief, the current multi-method multi-study thesis examined the individual motivational, self-regulatory, and the contextual factors underpinning academic achievement in Greek adolescent students, as well as the intricacies of Greek assessment

practices. Through quantitative and qualitative approaches, the thesis contributes to the literature in several ways. First, the thesis clarifies the structural relations between motivational beliefs and teachers' feedback. Second, the thesis shows that the quantity of feedback provision is not the key to improving academic achievement and probably more formative feedback might be preferable. Third, the findings challenge the assumption of negative interactions between motivational beliefs and metacognitive self-regulation. Fourth, the findings illustrate that different motivational variables probably do not comprise discreet entities. Fifth, the Greek assessment practices are associated with students' perceived cognitive test anxiety. Finally, a 'grade inflation' phenomenon is observed in Greek secondary schools, whereby students' grades do not accurately reflect their levels of attainment. Overall, the thesis can contribute to theories of self-regulated learning and student assessment, as well as to the development of targeted educational policies and changes in schools to improve students' achievement and prevent further declines in the future.

*Keywords:* academic motivation; academic achievement; metacognitive self-regulation; self-regulatory strategies; teachers' feedback, parental expectations; educational system; Greece

“As you set out for Ithaka,

hope your road is a long one,

full of adventure, full of discovery [...]” -C. P. Cavafy, Greek Poet

To my beloved parents, Eirini and Georgios,

for their love and support.

## Copyright statement

This thesis includes three published papers that are featuring in academic journals. The contributions from my supervisors do not exceed the normally accepted level of contribution from Cambridge Supervisors.

Study (copyright)	Publication reference	Author contribution	Thesis position
Study 1 (CC-BY 4.0)	Katsantonis, I., McLellan, R., & Torres, P. E. (2023). Unraveling the complexity of the associations between students' science achievement, motivation, and teachers' feedback. <i>Frontiers in Psychology</i> , 14. <a href="https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1124189">https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1124189</a>	IK: conceptualization, methodology, formal analysis, resources, data curation, writing—original draft, writing—review and editing, visualization, funding acquisition, and project administration. RM and PT: supervision.	Chapter 4
Study 2 (CC-BY 4.0)	Katsantonis, I., & McLellan, R. (2023). Person-centred study on higher-order interactions between students' motivational beliefs and metacognitive self-regulation: Links with school language achievement. <i>PLOS ONE</i> , 18(10), e0289367. <a href="https://doi.org/10.1371/journal.pone.0289367">https://doi.org/10.1371/journal.pone.0289367</a>	IK: conceptualization, methodology, formal analysis, resources, data curation, writing—original draft, writing—review and editing, visualization, funding acquisition, and project administration. RM: review & editing, supervision.	Chapter 5
Study 3 (CC-BY 4.0)	Katsantonis, I., & McLellan, R. (2023). Students' Voices: A Qualitative Study on Contextual, Motivational, and Self-Regulatory Factors Underpinning Language Achievement. <i>Education Sciences</i> , 13(8), Article 8. <a href="https://doi.org/10.3390/educsci13080804">https://doi.org/10.3390/educsci13080804</a>	Conceptualization, I.K.; methodology, I.K.; software, I.K.; validation, I.K. and R.M., formal analysis, I.K.; investigation, I.K.; resources, I.K.; data curation, I.K.; writing—original draft preparation, I.K.; writing—review and editing, I.K. and R.M.; visualization, I.K.; supervision, R.M.; project administration, I.K.; funding acquisition, I.K.	Chapter 6

*Note:* IK: Ioannis Katsantonis; RM: Ros McLellan; PT: Pablo E. Torres; CC-BY 4.0: Creative

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# Chapter 1. Introduction

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## 1.1. Background and statement of the problem

Academic achievement can be conceptualised as a measure of students' capacity to comprehend, master, and apply the knowledge that is taught in a school or other learning environment (Hattie, 2010). Woolfolk (2016) and Mertler (2017) consider achievement as the outcome of an assessment process that reflects not only the extent to which students, but also educators and institutions have achieved their educational goals. The measurement of a student's achievement level or standard is usually conducted through scores on tests, grades, or other evaluation metrics (Woolfolk, 2016).

The implications of academic achievement are far-reaching and transcend the confines of schools and educational systems. That is, research has shown that higher academic achievement is linked at the individual level with attaining a greater socio-economic position and on the societal level with societal prosperity (Spinath, 2012).

Yet, not all countries' adolescent students perform the same as shown in international comparative studies of academic skills (OECD, 2014, 2016a, 2019b). Particularly in Greece, which is the context of the present study, adolescent students' academic achievement is persistently declining in the last decade (see [Figure 1](#)).

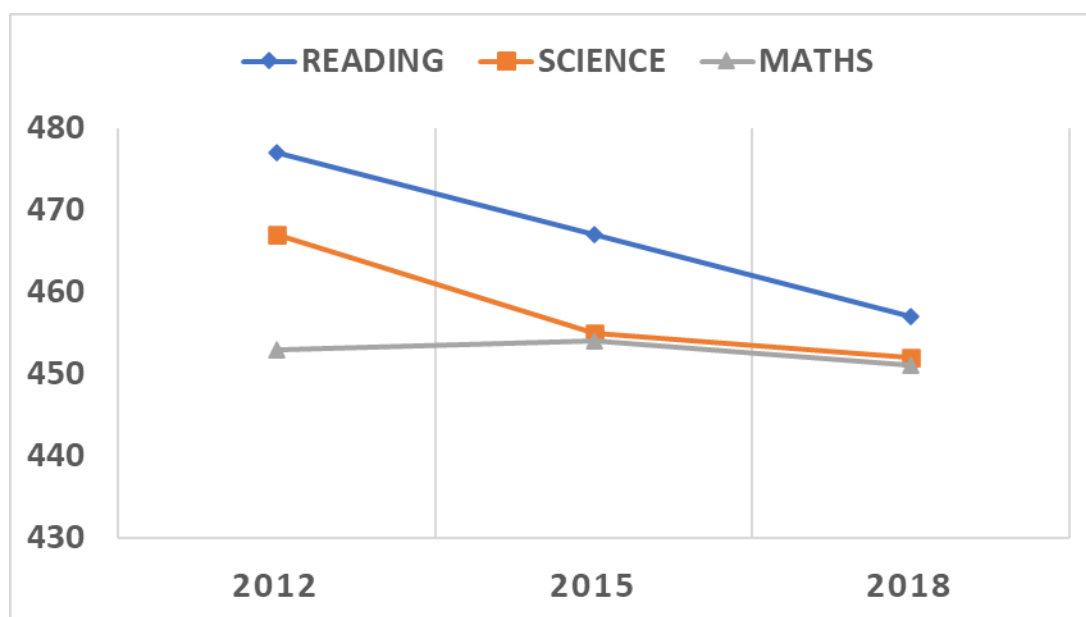


Figure 1. Trends in academic achievement in Greece (PISA time-series: 2012-2018) © The Author

The above raise the question to what extent are different factors associated with academic achievement in Greek adolescents. Adolescence is a period fraught with developmental challenges on multiple levels such as cognitive level, emotional and educational levels (Katsantonis et al., 2022). In fact, studies have noted that academic motivation in schools is declining (Wigfield et al., 2015), whereas metacognition is supposed to become more refined over time in adolescence (Moses-Payne et al., 2021; Weil et al., 2013). By studying the correlates of academic achievement in low-performance educational settings during adolescence, researchers can gain greater insights into how to improve adolescent students' academic achievement and literacy skills that have been noted to decline (Council of European Union, 2018), as well as increase the chances of individual and societal prosperity. Having grown and been a high school student in Greece, I am well positioned to explore this issue further and identify pathways to improved achievement. Therefore, it is important to examine the correlates of academic achievement during this developmental stage to provide insights into current achievement problems.

A common assumption is that overall declines in achievement may be explained by motivational and self-regulatory strategy factors (Karakolidis et al., 2016, 2019; Katsantonis, 2020; Pitsia et al., 2017) or the quality of teaching practices/strategies or a combination thereof (Rivkin et al., 2005; Schleicher, 2016; H. S. Yi & Lee, 2017). Drawing from social cognitive theory (Bandura, 1991; Schunk & DiBenedetto, 2020; Schunk & Usher, 2012), different factors act synergistically to potentially influence students' academic achievement. However, the most proximal factors of educational and psychological interest are those related to processes taking place in individual students and schools, namely the psychology of the "the way learners make things" (Winne & Nesbit, 2010) which refers to psychological processes that are under the explicit control of the learner (Winne & Nesbit, 2010). Hence, in this study, I focus mainly on students' motivation and self-regulation, but also consider other proximal environmental factors that might contribute to academic achievement, such as teachers' feedback, peer influences, and parental educational expectations. Hence, the current thesis aims through three empirical studies (Chapters 4, 5, and 6) to examine specifically how different motivational, self-regulatory, and proximal contextual factors can be used to contribute to the academic achievement of Greek adolescents.

In the following chapter (Chapter 2), I review theoretical models and the empirical literature to highlight four main “gaps” in extant knowledge that this thesis is going to help address. Studies on academic achievement in schools emphasise the importance of students’ self-regulated learning. However, these studies (a) typically reach inconsistent results regarding the interplay between different motivational variables that drive academic achievement, (b) overlook the interactionist nature of the relation between motivation and self-regulation, (c) fail to account for the role of proximal contextual factors, such as teachers’ feedback, peer influences, or parental educational expectations; (d) neglect to study students’ perceptions of the factors linked with their academic achievement through qualitative methodological ‘lens’. Before I introduce, though, the “gaps” in the literature that could help me identify the key factors and processes that could contribute to improved academic achievement in Greece, I briefly describe the structure and the functioning of the Greek educational context to give the reader a flavour of the context of the study.

## 1.2. The Greek educational context in focus

### 1.2.1 Structure of the Greek educational system and stages of education

The Greek educational system is centralised (see Figure 2 below), which means that the Ministry of Education is the highest authority for administrative and pedagogical matters (Kassotakis & Lambrakis-Paganos, 2004; Kougias & Efstathopoulos, 2020; Papastamatis, 2007). The ministry is advised on scientific and pedagogical matters by the Institute of Educational Policy (formerly the Pedagogical Institute), which is an executive scientific authority of the ministry and is responsible for the national curriculum, school textbooks, teacher training, teacher and school assessment, research in schools, combating school dropout, and safeguarding children’s rights to education, amongst other responsibilities<sup>1</sup> (Greek Government, 2011). Regional and local directorates of education are hierarchically below the ministry of education and are responsible for the implementation of national educational policies and schools<sup>2</sup> (Papastamatis, 2007). In this system, schools and teachers have limited autonomy to implement their own policies and pedagogical practices. This is because the system is centralised and requires uniformity from the allocation of funds to

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<sup>1</sup> <http://iep.edu.gr/en/administration-structure/what-is-i-e-p/aims-and-responsibilities>

<sup>2</sup> <https://eurydice.eacea.ec.europa.eu/national-education-systems/greece/overview>

school curriculums, textbooks, and policies concerning teachers and students (Persianis, 2003).

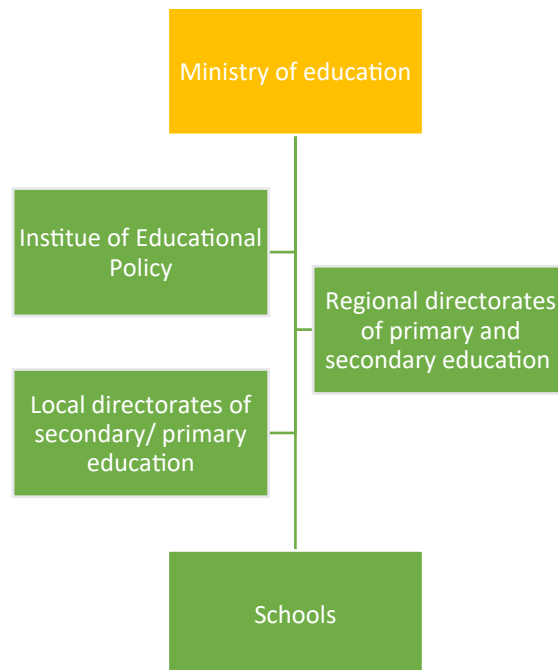


Figure 2. The hierarchical structure of the administrative part of the Greek educational system © The Author

Education in Greece is compulsory for all children from age 4 to age 15<sup>2</sup>. There are three broad key stages of education, namely kindergarten, primary school, and secondary school (see Figure 3) (Giamouridis & Bagley, 2006). Kindergarten and primary school attendance spans the ages 4 to 12, whilst secondary education lasts from ages 12 to 18<sup>2</sup> (Giamouridis & Bagley, 2006). Secondary school is further divided into two broad cycles of education called Gymnasium (lower secondary school- ages 12-15) and Lyceum (upper secondary school- ages 15 to 18)<sup>2</sup> (Giamouridis & Bagley, 2006). Only Gymnasium is part of the compulsory education<sup>2</sup>. The form of education is quite standardised in the primary and secondary schools, whereby teachers ought to implement the directives of the ministry and the national curriculum (Kougias & Efstathopoulos, 2020; Papastamatis, 2007). In both public state-funded and private primary and secondary schools, teachers are teaching the national curriculum using the official national textbooks (provided for free by the state) (Kassotakis & Lambrakis-Paganos, 2004). In fact, given the standardisation of the educational system, the ministry through the Institute of Educational Policy publishes each

year detailed guidelines on the content and the procedures of teaching of each subject (Ministry of Education, 2022). During each term (made up by four months), students are assessed through a summative written exam that is administered by the teacher; however, the final exam grade, which is numerical and ranges from 1 to 20, is a composite of the students' assignments' grades and short exams that take place inside each term (Ministry of Education, 2016). The Ministry prescribes the learning materials that ought to be taught in each term and the termly exams should cover the learning material that has been taught during the term. Teachers, though, have flexibility in terms of setting the specifics of the termly exams' content.

All students are taught by teachers who are graduates of higher education institutions after 4 or 5 years of studies<sup>2</sup>. However, subject-specific teachers (e.g., philologists, mathematicians, physicists, chemists) teach specific subjects in secondary schools that may not have undergone in-depth specialised teacher training (Bista et al., 2016).

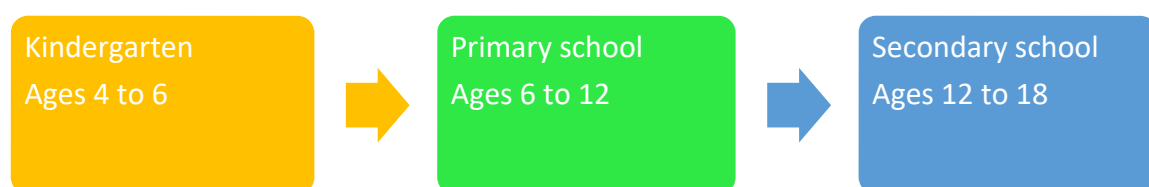


Figure 3. Key stages of the educational system in Greece © The Author

Given the developmental considerations outlined above in Chapter 1 (see also section 2.12) the present study was conducted with participating students in lower secondary schools and the first grade of upper secondary schools.

### 1.2.2. Performance indicators of the Greek educational system

In order to contextualise the study, I present some key performance indicators of the Greek educational system. Using internationally standardised comparative data from the PISA studies, I provide a brief outline of the schools' function in terms of human resources and policies. Additionally, I present some details regarding the teaching strategies implemented by Greek teachers in secondary school.

First of all, a trend (2012- 2015) comparative analysis of the academic achievement of students across countries has indicated that the Greek educational system is amongst the worst-performing systems in terms of academic achievement, academic excellence, and academic inclusion (Dominguez-Gil et al., 2022). Greek schools were also found to be amongst the worst in the social equity benchmarking dimension, which was defined as giving all students equal opportunities for personal growth of their capabilities independent of social, economic, and cultural advantages (Dominguez-Gil et al., 2022).

According to the international report of the results produced from PISA 2018 (OECD, 2019b), more than 25% of the students studying in Greek secondary schools in 2018 scored below the level 2 proficiency in language, science, and maths tests. The level 2 proficiency band indicates the minimum level of literacy skills that students should have developed by the end of secondary school according to the definition set out by the United Nations Sustainable Development Goals (OECD, 2019b).

Although there might be multiple reasons leading to this degree of under-performance and sustained academic decay, one such factor might be related to teaching quality. This hypothesis is further reinforced by the literature on educational effectiveness and teaching quality that suggests that teaching behaviours are significant determinants of students' achievement and metacognition (Caro et al., 2016; Kyriakides et al., 2020). In the Greek educational system, national data reveal that teachers of Greek language at secondary schools are at the bottom eight amongst 79 countries and economies in the provision of teacher support in language lessons (OECD, 2019d). An international comparative report on science teaching illustrated that Greek secondary school science teachers implemented amongst the highest teacher-directed instruction and provided less feedback compared to teachers from other countries (OECD, 2016b).

In brief, the current thesis is focused on two achievement domains, namely science and language, with greater emphasis on language given the following reasons. First, both language achievement and science achievement in Greece were following rather steep declines even in the pre-COVID19 era (see Figure 1). Second, science secondary school teachers provided less feedback compared to other countries and were adopting more teacher-oriented strategies. Thus, it is necessary to explore how science teachers' feedback is associated with science achievement. Third, I argue that the declines in language

achievement are even more important than science since language serves as the foundation for humans' cognitions and learning (Gottlieb, 2016; Halliday, 1993). Given the above considerations, it is important to study how specific teaching strategies are linked with students' achievement and perceptions of achievement in this low-performance educational context.

### 1.3. Organisation of the thesis

Keeping in mind the above, the present dissertation is organised the following way. In the next chapter (**Chapter 2**), I present the theoretical and conceptual foundations of the thesis and review relevant empirical literature to highlight gaps in extant knowledge that the current thesis aims to address. Specifically, I discuss the adopted models of self-regulated learning and their component processes. That is, I define and review some evidence on self-efficacy, goal orientations, extrinsic and intrinsic motivation, and metacognitive self-regulatory strategy use. Additionally, I review literature on the contextual factors, such as teacher feedback processes, peer influences, and parental educational expectations that play an important role in shaping both students' motivational beliefs and self-regulatory strategy use. **Chapter 2** concludes with a synthesis of the literature and an overview of the research questions. Following directly from the Literature Review chapter, I outline in **Chapter 3** my epistemological assumptions about my approach to the issue of academic achievement by emphasising the *pragmatic* nature of my research project and objectives.

Prior to delving into the three empirical studies, I provide an overview of the methodological choices underpinning the empirical part of my thesis in a brief synopsis of the Methodology of the three empirical studies in **Chapter 3**. Afterwards, in **Chapters 4 to 6**, I present more extensive literature reviews of empirical and theoretical evidence related to each empirical study aiming to underscore the primary and secondary knowledge and evidence gaps identified, the methodological choices, the findings, and the study-specific discussions related to each sub-study. In Study 1 (**Chapter 4**), I examine through a multi-level perspective the role of teachers' feedback in shaping students' achievement in science through students' motivational beliefs using robust nationally representative data from the Greek PISA 2015. In this study, I also examine the interplay between students' motivational beliefs and academic achievement.

Next, in Study 2 (**Chapter 5**), I go beyond variable-centred perspectives on students' motivation and self-regulation and investigate optimal subgroups of profiles of adolescent students' motivational and self-regulatory metacognitive strategy use characteristics in the language subject area. Furthermore, I connect these profiles to students' language achievement. In the final Study 3 (**Chapter 6**), I adopt a qualitative interview-based approach, whereby I summarise the findings of the qualitative strand of this project. This qualitative study aims to explore students' own perceptions with regards to self-regulatory strategy use, motivational beliefs, the role of teachers, parents, and peers in relation to language achievement. The dissertation culminates (**Chapter 7**) with a general discussion, the contribution of my research to extant knowledge, the implications for educational policy and practice, the limitations of my empirical studies, and some final remarks.

## **Chapter 2. Literature Review**

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In this chapter, I provide details regarding the theoretical background of the thesis. Specifically, this chapter serves as a literature review that highlights the outstanding issues in the existing knowledge that the thesis aims to address and it provides greater details on the theoretical assumptions and foundations that underlie the three empirical studies. In other words, I outline and describe the conceptual framework grounded in social-cognitive theory (section **2.1.**), the models of self-regulated learning that I use to conceptualise the relations amongst the various motivational beliefs (section **2.2.**), then I delve into the definitions of self-efficacy (section **2.3.1.**), achievement goals (section **2.3.2.**), and intrinsic and extrinsic motivation (section **2.3.3.**).

Afterwards, I highlight the first research gap pertaining to the interplay of the abovementioned motivational beliefs in predicting academic achievement (section **2.3.4.**). Next, I explain why researchers need to shift from variable-centred to person-centred perspectives in the study of self-regulated learning and academic achievement, highlighting, thus, the second research gap (section **2.4.**). Having explicated the key terms of the thesis, I explain the significant value of self-regulated learning (integrating both motivation and metacognition) as an explanatory factor of students' academic achievement (section **2.5.**). Having explained the personal variables that could be linked with academic achievement, I give a detailed account on the role of proximal contextual factors and specifically, teachers' feedback (section **2.6.**), parental educational expectations (section **2.7.**), and peer influences (section **2.8.**).

Furthermore, I argue why self-report measures of self-regulated learning are important for educational effectiveness research in schools (section **2.9.**) and the need for qualitative approaches to the study of academic achievement and the factors that influence it (section **2.10.**).

Following up on the methodological choice of self-report measures and the lack of qualitative interview-based studies, I outline why the developmental period of adolescence is an ideal period for this kind of research considering the declines in academic motivation and self-regulated learning strategies (section **2.11.**). The literature review Chapter 2 concludes with a short section (section **2.12.**) wherein I synthesise the literature so far, describe the main objective of the thesis, introduce the research questions, and how the three empirical studies will address the research gaps identified.

## 2.1. Social-cognitive theory perspective on students' academic achievement

In the present section, I begin with a review of the social-cognitive theory. Bandura's social-cognitive theory (Bandura, 1991, 1997) can serve as an overarching theoretical framework that can explain the processes and the factors underpinning academic achievement and underachievement. The hallmark position of social cognitive theory (Bandura, 2018) is that individuals' cognitive, affective, and biological mechanisms are linked causally and reciprocally with (external) behavioural and environmental influences (see Figure 4). The model assumes that these three factors (person, behaviour, environment) are linked bidirectionally, which means that the individuals affect the environment but the environment also affects the individuals and their behaviour (Bandura, 2006, 2018; Schunk & Usher, 2012).

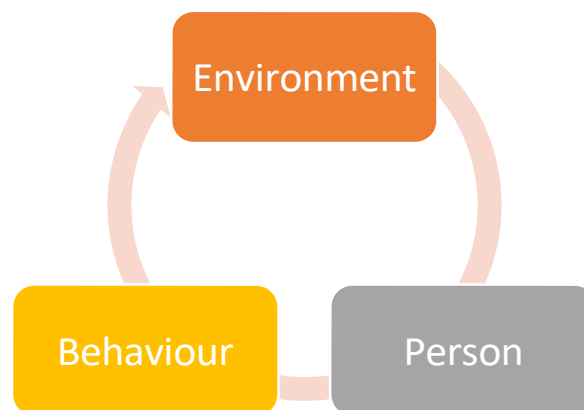


Figure 4. Triadic reciprocal model of social cognitive theory © Adaption from Bandura (2018) by The Author

Social-cognitive theory has generated a lot of research on students' motivation (Bandura, 1991) and self-regulation (Usher & Schunk, 2018); however, the theory has been underutilised in exploring the links between the environmental determinants and the personal motivation and self-regulation of students. A recent social-cognitive perspective on students' motivation has outlined some key personal motivational (e.g., self-efficacy, outcome expectations, values), environmental (e.g., feedback, instruction, social models, rewards), and behavioural processes (e.g., effort, persistence, achievement) (Schunk &

DiBenedetto, 2020). Nevertheless, I expand this view by including also several other key motivational factors (goal orientations, intrinsic and extrinsic motivation), metacognitive self-regulatory factors (metacognitive strategies), and environmental factors (teachers' feedback, parental expectations, and the role of peers). The present conceptual framework is presented in Figure 5.

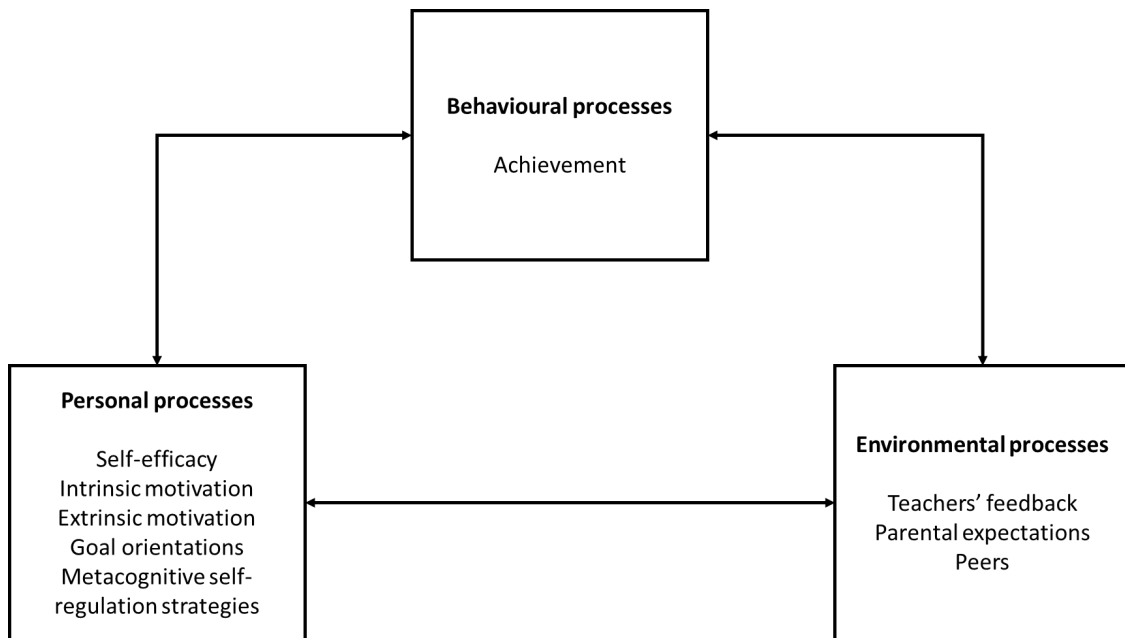


Figure 5. Social-cognitive conceptual framework of the present study © The Author

The diagram in Figure 5 shows three key processes that are linked amongst themselves. Under the personal processes, I place first a cluster of students' academic motivation, which is defined here as motivational self-beliefs of competence (e.g., self-efficacy), goals (e.g., goal orientations), and intrinsic (e.g., interest, enjoyment) and extrinsic (e.g., incentives) motivation (Wigfield et al., 2021). The second cluster of personal processes includes metacognitive self-regulatory strategies that students utilise when engaging with an academic task or subject. These metacognitive self-regulatory strategies include broad strategies of planning, monitoring, and several self-control strategies such as time management, social help-seeking, task-related strategies, interest incentives, environmental restructuring, imagery, and self-instruction (Cleary & Zimmerman, 2012; Panadero, 2017; Panadero & Alonso-Tapia, 2014). The key environmental processes considered here are mostly pertaining to instructional variables (teachers' feedback), assessment, peers as

comparison standards, and parental achievement expectations. Finally, the key behavioural outcome is academic achievement, though effort and persistence in an academic task/homework are briefly considered in the qualitative part of the thesis (Study 3).

The first environmental process considered in this thesis is teachers' feedback. Given the educational effectiveness approach of the thesis, teachers' feedback is considered here the most important environmental-contextual process since it is directly linked with teaching quality. Different components of students' academic motivation have been connected in various ways with students' achievement (Karlen, 2016; Katsantonis, 2020; Magni et al., 2021; Skaalvik et al., 2015) and different aspects of students' academic motivation have been associated with teachers' feedback, whereby feedback was correlated with greater academic motivation in some cases but lower motivation in some other instances (Fong et al., 2019; Henderlong Corpus & Lepper, 2007; Pekrun et al., 2014; Shin et al., 2017). Teachers' feedback is also very important for students' self-regulation since contemporary social-cognitive models of self-regulated learning place significant emphasis on receiving feedback in order to promote students self-regulated learning (Zimmerman & Moylan, 2009). Finally, teachers' feedback and academic achievement are also significantly correlated (Kluger & DeNisi, 1996; Swaffield, 2008) but the association is quite controversial, as will be discussed below in section 2.6. The current findings for the role of teachers' feedback in academic achievement and motivation are discussed in Study 1. In Study 3, students' own perceptions and beliefs regarding the role of teachers' feedback are presented. Two other contextual factors that are less central to the thesis, but still have a role to play in students' learning and achievement, comprise parental short-term educational expectations and peer influences, which are discussed below.

Parents and, specifically, parental expectations of achievement have been found to be connected with students' achievement. Modern relational developmental systems theory recognise the importance of parents' values and expectations for their children's productive development (Lerner, Johnson, et al., 2015; Lerner, Lerner, et al., 2015). Research has shown that parents' educational expectations are correlated with students' academic achievement (Jeynes, 2022; Lazarides et al., 2016; Piquart & Ebeling, 2020), metacognitive self-regulatory strategies (Pino-Pasternak & Whitebread, 2010) and academic motivation (Lazarides et al., 2016; Pino-Pasternak & Whitebread, 2010). The role of parental

expectations is discussed in greater depth in section 2.7 and the empirical findings are presented in Study 3 (Chapter 6).

Peers also play an important role since they are sources of academic motivation. Specifically, self-efficacy theory suggests that one source of self-confidence in one's capabilities is vicarious experiences, whereby a student compares his/her/they own attainment level to that of other students (Usher, 2009a). This process of social comparison has also been identified as important for building academic self-concept (Marsh, 1987; Pitsia et al., 2017), which has a motivational force (Efklides, 2011). Similarly, research has connected peer comparisons with students' goal orientations (Summers et al., 2003). Peer normative comparisons (see also section 2.8. Peer influences on academic achievement and self-regulated learning) have also been linked with academic achievement (Wetsch, 2009). The findings regarding the role of peers in academic achievement are discussed in Study 3 (Chapter 6).

The above paragraphs provided a brief overview of the component processes of the current conceptual framework. However, I have not so far described in greater detail the ways in which these factors function. Therefore, it is important to outline below the definitions and the theoretical linkages between the factors in Figure 5. Hence, in the following sections, I will outline the key definitions and the connections between the factors shown in the conceptual framework of the thesis.

## **2.2. Self-regulated learning: A platform to link motivation and metacognitive strategy use**

This section begins with a discussion of the theoretical models on self-regulated learning, which merge different strands of motivational and metacognitive research (Zimmerman & Moylan, 2009). Self-regulated learning is considered here as an overarching concept that subsumes the key personal process of my conceptual model (Figure 5).

Self-regulation, in general, refers to intentional control of emotional, behavioural, and cognitive reactions towards a more adaptive purpose (McClelland et al., 2010). Occurrence of self-regulation (of learning) requires executive functions, which are defined as higher-order cognitive skills including planning, inhibitory control, working memory, persistence, and so forth (Barkley, 2001; Blair & Diamond, 2008; Diamond, 2013; M. K. Lee

et al., 2018; Marulis et al., 2020). Thus, executive functions should not be confused with self-regulated learning since executive functions pertain to trait-like higher-order mental processes (Cleary & Kitsantas, 2017), whereas self-regulated learning is a connotation applied to the learning context being conceptualised and operationalised as a multidimensional construct encompassing cognitive and metacognitive strategies utilised by students to direct, monitor, and control their cognition and motivation (Pintrich, 1999; Zimmerman & Moylan, 2009). The above do not mean that executive functions are not needed for self-regulated learning (Baggetta & Alexander, 2016; Effeney et al., 2013a; Garner, 2009), but the study of executive functions is typically the focus of cognitive (neuro-)science or clinical science (Bridgett et al., 2013) and lies beyond the scope of their present thesis.

A recent literature review highlighted the existence of six theoretical models of self-regulated learning (Panadero, 2017). These models include Zimmerman's model (Zimmerman, 2000a; Zimmerman & Moylan, 2009), Efklides' Metacognitive and affective model of self-regulated learning (Efklides, 2011), Järvelä and Hadwin's (2013) Socially shared self-regulated learning model, Pintrich's model (Pintrich, 1999), Winne and Hadwin's model (Winne, 2018), and Boekaerts' Dual Processing model (Boekaerts, 1991).

Despite the variety of extant theoretical perspectives, the current operationalisation of self-regulated learning is grounded in Zimmerman's (Zimmerman, 2000a; Zimmerman & Moylan, 2009) and Efklides' (Efklides, 2011; Efklides et al., 2018) models of self-regulated learning that have been inspired by the social-cognitive theory (Bandura, 1991). The decision to ground the current thesis in those two models was based on the following reasons. First, the Järvelä and Hadwin (2013) model emphasises the social aspects of self-regulated learning in which individual students' self-regulation is facilitated by other students' self-regulation, which results in a "co-regulation in collaboration". This latter construct has long been in dispute (Panadero & Järvelä, 2015). Additionally, academic achievement in Greek schools in terms of grades and exams is an individual-level variable and, hence, this model does not appear to be particularly aligned with the aims of the thesis. Pintrich's model of self-regulated learning is very relevant to this study and could have been a suitable alternative; however, according to Pandero (2017), there is no direct empirical testing of this model. Recent work based on the Winne and Hadwin's model

(Winne, 2018) is focusing on online or “self-regulated learning as an event” measurement through computerised trace logs (for a greater discussion see **section 2.9.** below), which is not aligned with the aims of the current thesis. Additionally, there is no direct self-report measure to tap into the processes outlined in this model (Panadero, 2017). Finally, the Dual Processing model (Boekaerts, 1991; Boekaerts & Cascallar, 2006) makes a clear distinction between two pathways for self-regulated learning, namely self-regulation for attaining a goal (mastery/growth) and self-regulation for preventing harm to one’s well-being. Since well-being is beyond the scope of the present thesis, this model was considered an inappropriate theoretical foundation for the empirical studies.

Given the above considerations, I describe in the sections below the key features of the two selected social-cognitive models of self-regulated learning and comment on their relevance for my research.

### **2.2.1. The cyclical three-phase model of self-regulated learning**

Zimmerman’s (Zimmerman, 2000a; Zimmerman & Moylan, 2009) model follows the social cognitive tradition (Schunk, 2005; Zimmerman, 2000a); that is, it recognises the importance of social aspects in shaping cognitive activities. The model recognises the possibility of contextual influences on motivational processes (Zimmerman, 2002) and integrates smoothly self-efficacy and other important motivational constructs (goal orientations, intrinsic motivation) with self-regulatory strategy processes (Cleary & Zimmerman, 2012; Zimmerman, 2008).

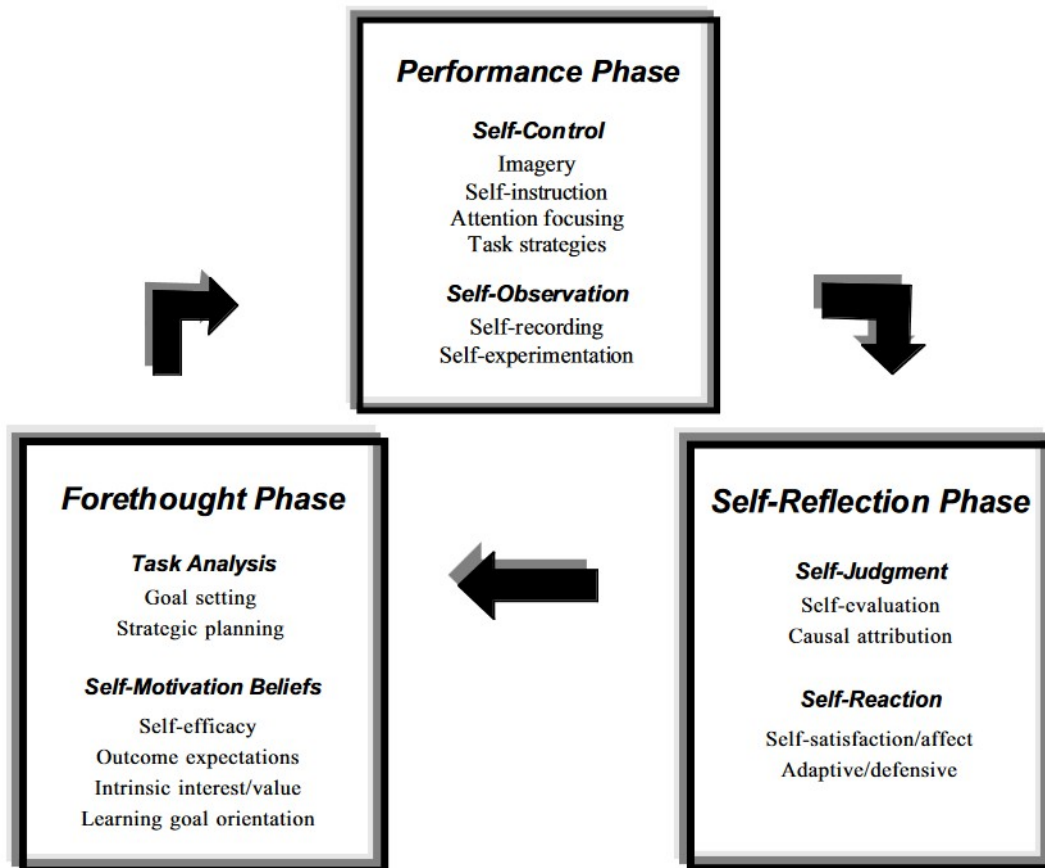


Figure 6. Cyclical three-phase model of self-regulated learning © Zimmerman (2010)

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Zimmerman’s model of self-regulated learning (Zimmerman, 1990b, 2002, 2008; Zimmerman & Moylan, 2009), which is very similar to Pintrich’s (Pintrich, 1999, 2000b) model (Pintrich, 1999, 2000b) but more up to date, postulates three main cyclical phases (Figure 6) that are required for achieving self-regulation of learning. These phases clearly map onto the processes that take place before, during, and after learning and performing (Cleary & Kitsantas, 2017). The first phase is called forethought which is further divided into task analysis (setting goals, strategic planning) and motivational beliefs (self-efficacy, task interest/value, goal orientations, and outcome expectancies) (Zimmerman & Moylan, 2009). Thus, the task analysis component implies specifying (from proximal to distal) goals to achieve and selecting appropriate and effective techniques for the task and the context at hand (Zimmerman et al., 2017). Furthermore, the self-motivation subcomponent includes self-efficacy beliefs, which are core features of students’ motivation, outcome expectancies,

which are beliefs about the consequences of performance, task value/interest, which includes students' intrinsic motivation, and goal orientations, which reflect the learner's reasons for learning (Cleary & Zimmerman, 2012; Zimmerman et al., 2017). Given the integral role of the self-motivational beliefs in this project, I will discuss these psychological constructs extensively in the section 2.3.

Following the activation of the component processes of the forethought phase, the self-regulatory cycle proceeds to the performance phase. The performance phase includes two broad categories of self-regulatory strategies, namely self-control strategies and self-observation strategies (Zimmerman, 2000a). Self-control includes a constellation of strategies such as time management, social help-seeking, task-related strategies, interest incentives, environmental restructuring, imagery, and self-instruction (Panadero & Alonso-Tapia, 2014). Self-control strategies can be distinguished between those of a metacognitive nature and those of a motivational nature (Panadero & Alonso-Tapia, 2014). The precise definitions of each strategy are presented in Table 1.

Table 1. Definitions of self-control strategies for self-regulated learning

	Self-Control Strategy	Definition
Metacognitive	Self-instruction	Implicit or explicit descriptions of how to progress through a task completion process
	Task strategies	Use of specific methods related to the task at hand
	Imagery	Graphical (mental) representations to organise the information and assist learning and information retention
	Time management	Strategies for completing tasks on time
	Environmental restructuring	Techniques to improve the effectiveness of the proximal environment
	Social help-seeking	Seeking assistance while learning or performing a task
	Motivational	Interest incentives
	Self-consequences	Self-setting rewards or punishing conditions

Note: Definitions according to Zimmerman (2002) and Zimmerman et al. (2017)

To be effectively self-regulating, students require to constantly self-observe their efforts. Thus, self-observation strategies play a critical role in students' self-regulation (Zimmerman et al., 2017). The self-observation component of the performance phase includes two sub-component processes, namely metacognitive monitoring (i.e., mentally keeping track of outcomes and progress) and self-recording (i.e., keep formal records of progress and outcomes) (Callan & Cleary, 2019). Having completed the performance phase, the self-regulated learner progresses to the last stage of self-regulation, which is the self-reflection phase.

The self-reflection phase comprises two component processes; that is, it requires self-evaluation in comparison to a standard (e.g., prior performance, mastery, or vicarious experiences) and self-reaction to the self-evaluation (i.e., cognitive and emotional self-satisfaction, and adaptive decision to engage again in the learning process) (Zimmerman & Moylan, 2009).

The forethought phase of self-regulated learning involves self-motivational variables, such as self-efficacy, goal orientations, intrinsic motivation as necessary components of self-regulation (Zimmerman, 2002; Zimmerman & Moylan, 2009). Cognitive and metacognitive components are also necessary (Pintrich, 2000b; Zimmerman & Moylan, 2009). Individuals attempt to regulate these components. An attempt does not mean that a component will/or can be regulated since there are biological, developmental, or contextual constraints that may impede regulation (Pintrich, 2000b). On the other hand, these can be activated unconsciously or automatically (Pintrich, 2000b). According to contemporary self-regulated learning models (Panadero, 2017; Schunk, 2005; Zimmerman, 2002), self-regulated learning is made up collectively by all these components. In small-scale research practice though, it is not possible to measure all these components in a single study. Given that a model is a reductionist representation of reality (Kline, 2023) and the infeasibility to measure all aspects of self-regulated learning in one study, the three studies aim to capture collectively some aspects of the complexity of self-regulated learning and its relationship with achievement. The exact nature of these aspects is outlined and justified in the section 2.2.2 and 2.3.

### **2.2.2. The metacognitive and affective model of self-regulated learning (MASRL)**

The second equally important social-cognitive model of self-regulated learning that is used to guide the present project is the Metacognitive and Affective Model of Self-Regulated Learning (MASRL) (Efklides, 2011, 2019). The MASRL model (see Figure 7) is grounded in an interactionist multi-level perspective (Panadero, 2017). The MASRL describes processes at two different but interconnected levels, namely the person-level, which is the level of a student’s stable cognitive, motivational, affective, and metacognitive characteristics, and the person x task-level, which reflects the interactions between the learning task’ and the person’s characteristics (Efklides, 2011). In the sections, I outline briefly the person level and task x person level.

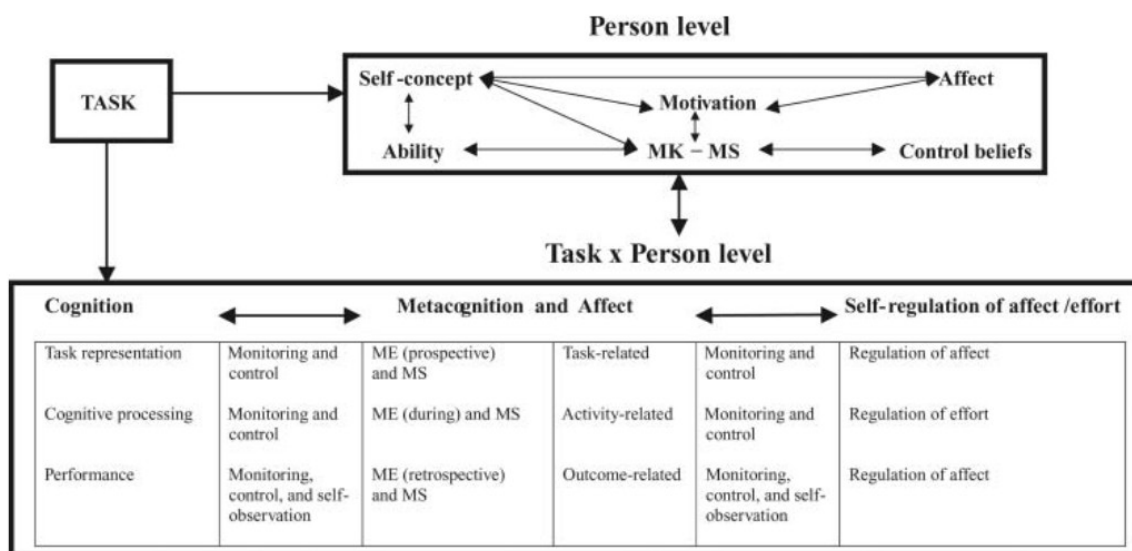


Figure 7. The metacognitive and affective model of self-regulated learning © Efklides (2011)

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Note: MK: Metacognitive knowledge; MS: Metacognitive skills; ME: Metacognitive experiences

The person-level of the MASRL model is aligned with the “classical” view of self-regulated learning, which reflects students’ characteristics (Panadero, 2017). At the person-level, students have access to cognitive, motivational, affective, and metacognitive processes before or after the completion of task processing and these factors may interact (Efklides, 2011). Such an interaction may, for example, be a student, who has a high self-

efficacy belief that he/she/they can achieve in a task but may underestimate the cognitive demands (i.e., a failure in metacognition) and, thus, fail to achieve.

The MASRL outlines four specific component processes. The cognitive aspect refers to students' cognitive resources, such as ability, knowledge, and skillset (Efklides, 2011), which is assumed to be sufficiently developed in students participating in the current study. Motivation may include expectancy values, learning goal orientations, intrinsic motivation, and self-efficacy, amongst others (Efklides, 2019). Affect is usually defined as transient subjective experiences of pleasant versus unpleasant valence (Forgas, 1994). In the context of the MASRL model, the affective component includes self-concept, attitudes, and emotional traits (e.g., anxiety) (Efklides, 2019).

The metacognitive component can include metacognitive knowledge, abbreviated as MK in the figure above (i.e., declarative knowledge of person, task, others, goals, and strategies), and metacognitive skills, abbreviated as MS in the figure above (i.e., strategies and knowledge used for the self-control including planning, monitoring, and regulating) (Efklides, 2017). The above component processes at the person-level interact and, thus, inform self-regulated learning according to the MASRL model (Efklides et al., 2018). Yet, the nature (whether positive or negative) of these interactions is largely overlooked in past empirical studies since researchers neglect to account for these higher-order interactions when testing predictive models of academic achievement. This constitutes an even larger gap since some studies report that academic motivation is thought to drop in adolescence during secondary school (Ahmed et al., 2013; Wang & Eccles, 2012; Wigfield et al., 2015), but some other studies suggest that metacognitive skills become more refined in this period (Schneider, 2010; Veenman et al., 2006; Weil et al., 2013). Hence, studying the interactive patterns between academic motivation and metacognitive skills in adolescence can contribute to extant knowledge. The MASRL model places significant emphasis on the metacognitive aspects of learning and performance before and during the engagement with a learning activity (Efklides, 2011). As can be seen in Figure 7 above, where the MASRL model is graphically configured, the MASRL model integrates metacognitive knowledge and metacognitive skills at the person-level and includes metacognitive experiences at the task x person level. Therefore, it is important to briefly discuss what these terms mean.

In general, the term “metacognition” was introduced in late 70s’ by Flavell (1979), who defined metacognition as “cognition of cognition”, indicating that it comprises monitoring and control of cognitive phenomena (e.g., memory, comprehension). Flavell’s (1979) proposed model of metacognition included four types of phenomena, namely (a) metacognitive knowledge; (b) metacognitive experiences; (c) goals (tasks); (d) actions (strategies). Metacognitive knowledge refers to students’ memorised declarative knowledge about persons, the task, strategies, and goals (Efklides, 2008). Metacognitive task-knowledge is knowing the different types of tasks and how they should be approached and processed (Efklides, 2008). Metacognitive knowledge involves knowing multiple strategies and the how, when, why strategies should be applied (Efklides, 2008). Metacognitive goal-knowledge involves knowledge of goals to be set and pursued, while processing a specific task or situation (Efklides, 2008).

Another important aspect of metacognition is metacognitive experiences, which refers to judgments/ estimates of learning, as well as feelings of the difficulty, ease, and knowing a task (Efklides, 2006; Efklides & Petkaki, 2005). Metacognitive experiences can be activated before, during, and after the processing of a task (Efklides & Petkaki, 2005). For example, in the cyclical model’s self-reflection phase, feelings of self-satisfaction at the end of the task processing process could be called metacognitive experiences. Finally, the term metacognitive skills is used to describe a range of deliberate (actions) strategies utilised to plan, monitor, regulate, and evaluate the cognitive processing of a task (Efklides, 2008; Stephanou & Mpiontini, 2017). Metacognitive skills, as defined by Efklides (2008), is semantically equivalent to Pintrich’s et al. (1991) metacognitive self-regulation construct since Pintrich et al. (1991) define metacognitive self-regulation as comprising planning, monitoring, and regulating activities. Planning is typically defined as setting task-oriented goals (Pintrich et al., 1991). Monitoring involves consciously keeping track of one’s task-/goal-relevant attention, whilst evaluation involves checking, correcting, and adjusting one’s strategic learning approach while progressing through a task (Pintrich et al., 1991). Since strategies utilised to smooth the regulation, control, and planning of cognitive processes are higher-order skills and more difficult to be taught (de Boer et al., 2018), the present thesis focuses on metacognitive self-regulation more. In short, metacognitive

knowledge of task-specific strategies is part of Study 3 (see Chapter 6), whereas metacognitive self-regulation or skills are part of Study 2 (see Chapter 5).

The processes described by the MASRL model situated at the person x task level take place during the execution of the task (Efklides, 2011). At this level, motivation is not a concrete separate component, rather motivation is activated through metacognitive and emotional experiences due to the task's features (e.g., difficulty, ease, content, etc.) (Efklides, 2011) This level is made up by three phases called "task representation", "cognitive processing", and "performance" which are governed by monitoring and control of cognition (Efklides, 2017, 2019). Task representation is the stage before the actual processing of the task, whereby students generate a granular view of the task's requirements and features leading to setting goals and planning (Efklides, 2011) guided by subjective feelings of difficulty and ease (Efklides, 2006). Given an automatic task representation and memory retrieval of the required response to the task's demands, the cognitive processing phase may be rapid and non-analytic; however, if the task's cognitive demands are higher and require an effortful task representation, cognitive interruptions and overload may occur leading to negative affective states such as anxiety or exhaustion (Efklides, 2011). The third and final phase of task processing is called "performance phase", whereby students' metacognitive experiences based on the outcome of the task processing activate (feelings of satisfaction and confidence, and estimates of success) after having completed the cognitive processing of the task (Efklides, 2011). Since the current thesis is not a "online" study of self-regulation during the execution of a task process, the person x task level is only relevant when students reflect back to their experiences in engaging with a task.

### **2.2.3. Reflections on the two models of self-regulated learning: Implications for the present study**

In the sections above, I presented the basic theoretical tenets of two social-cognitive models of self-regulated learning. These two models of self-regulated learning (i.e., the cyclical and the MASRL models) have interlinked implications for the study of the links between achievement, motivational, and metacognitive processes. A significant distinction

between the two models is that Zimmerman's model (Cleary & Zimmerman, 2012; Zimmerman, 2002) is more person-level orientated compared to Efklides' (2011) model (Panadero, 2017). This means that the factors and processes outlined in the three-phase cyclical model are considered to be a generalised level of self-regulated learning functioning reflecting students' self-regulated learning characteristics (Panadero, 2017). The MASRL model, though, explicitly suggests that the personal self-regulated learning characteristics (motivation, affect, cognition, metacognition) inform and interact with the task's features at the person x task level, where processing of the task takes place.

A significant difference between the cyclical self-regulated learning and the MASRL models is that the latter emphasises affective states throughout self-regulated learning functioning (Efklides, 2011), whereas the first includes emotion only in the self-appraisal/self-reflection and forethought phases (Zimmerman, 2002). A second major difference is the interactionist nature of the MASRL model (Efklides, 2019). In the case of the cyclical model of self-regulated learning, there are three separate phases comprising different subcomponent processes that feed forward; that is, processes at the forethought phase inform the performance phase which informs the self-reflection phase, which, in turn, influences the forethought phase in an "eternal" feedback loop (Zimmerman & Moylan, 2009). However, the MASRL model explicitly indicates that the different subcomponent processes interact at the person-level (Efklides, 2019), suggesting that self-regulated learning is informed by the interactions between cognition, motivation, metacognition, and affect (Efklides et al., 2018).

The MASRL model is more metacognitively oriented since different facets of metacognition play a key role in the different levels of self-regulated learning functioning (Efklides, 2017). In contrast, metacognition features in the cyclical model only in the performance and self-evaluation phases (Panadero & Alonso-Tapia, 2014). The aspects of metacognition in the cyclical model's performance and self-appraisal phases take the form of metacognitive skills and knowledge (e.g., learning strategies) and metacognitive experiences (e.g., feelings of correctness and satisfaction). Another significant distinction between the two theoretical accounts of self-regulated learning is that self-motivation (e.g., self-efficacy, goal orientations) in the cyclical model is considered an essential element of self-regulated learning, but the MASRL models considers motivation a precondition for self-

regulated learning (R. S. Jansen et al., 2019). Although the cyclical model of self-regulated learning clearly states what motivational factors and metacognitive strategies are involved in successful self-regulated learning, the MASRL does not provide clear guidance about the separate subcomponent elements of motivation and metacognitive strategies utilised before and during task processing (see Efklides, 2011; Zimmerman & Moylan, 2009).

The above reflections on the two models' features have important implications for the present study. Firstly, I draw upon the cyclical model to select the relevant motivational and metacognitive factors that are part of the three empirical sub-studies. The cyclical model is selected because it clearly incorporates specific motivational factors into the self-regulation process (see sections 2.2.1. and 2.3.). Secondly, I utilise the MASRL interactive specification between metacognition and motivation in the second study since this is an important addition to the older cyclical model that merits further study. Last but not least, I draw upon the clear distinction of the person-level and the task x person level of the MASRL model, whereby both the motivational and metacognitive processes at the person-level influence the task x person level in a top-down fashion (Efklides, 2011). All in all, both models are useful since they complement each other and each offers several advantages in terms of conceptualisations of the different motivational and metacognitive processes that influence achievement.

### **2.3. Motivational beliefs in self-regulated learning**

As discussed previously, metacognitive control and strategy use do not suffice in order for students to become self-regulated learners (Pérez-González et al., 2022). Pintrich was one of the first theorists to highlight students' motivational beliefs as important part of self-regulated learning (Panadero, 2017). Nowadays, motivational processes are considered to suffuse behavioural, cognitive, and environmental factors that influence students' self-regulation (Schunk, 2005). In fact, Zimmerman's model of self-regulated learning (Zimmerman et al., 2017) explicitly suggests that students' motivational processes need to be activated first in the forethought phase prior to the performance phase, where self-regulatory metacognitive strategy use becomes more involved. The MASRL model, though, considers motivation as an important precursor for self-regulated learning with R. S. Jansen et al. (2019) noting that amotivated learners will not engage in self-regulatory activities.

Therefore, it is important to study students' motivation along with their self-regulatory strategy use. To this end, I review the most important motivational processes that are suggested by Zimmerman's model of self-regulated learning (see section 2.2.1). These important motivational variables include self-efficacy (section 2.3.1), achievement goal orientations (see section 2.3.2), and intrinsic motivation (see section 2.3.3).

### **2.3.1. Self-efficacy: An integral belief for learning**

Amongst the motivational processes outlined in Zimmerman's model of self-regulated learning, self-efficacy has a key role since it has been posited to be an essential belief for learning, demonstrating a high discriminant validity from other motivational mechanisms, and, in fact, predicts both students' motivation and learning outcomes (Zimmerman, 2000b). Most of the theoretical work on self-efficacy is grounded in Bandura's (1997) Social Cognitive theory. According to Bandura's (1997) social-cognitive theory, self-efficacy is defined as personal belief in self-capabilities to achieve desired levels of performance that affect life events. Self-efficacy can determine people's emotions, motivation, cognitions, and behaviours (Marsh et al., 2019). Additionally, the social-cognitive theory underscores the notion of human agency; that is, the belief that people are capable of exercising a degree of control over their psychosocial functioning and circumstances (Bandura, 2006, 2018). In this agentic framework, self-efficacy plays a major role by contributing to the functioning of the different agentic processes since individuals' self-efficacy beliefs influence people's goal-setting and persistence to the goals (Bandura, 2018).

In this broader theoretical framework, self-efficacy has ascended as a critical component of social-cognitive theory that reflects a self-appraisal of capability to organise and execute actions that will help people achieve their goals (Bandura, 1997). Although some consider self-efficacy to be a motive (Zimmerman, 2000b; Zimmerman & Moylan, 2009), there are other researchers who consider self-efficacy to be a distinct cognitive construct that is, however, predictive of students' motivational outcomes (Schunk & DiBenedetto, 2020).

It is underscored that the cyclical three-phase model of self-regulated learning includes another motivational construct called outcome expectancy that is highly related to

self-efficacy (Zimmerman et al., 2017), which is broadly defined as the perceived probability that an individual's behaviour, if executed in a specific situation, will result in a specific outcome (Kirsch, 1995). Although outcome expectancy and self-efficacy are considered distinct expectancy beliefs (Pajares, 1996), the social cognitive theory (Bandura, 1997) maintains that self-efficacy beliefs are more predictive of achievement and academic choices (see also Wigfield & Eccles, 2000). Additionally, as Pajares (1996) accurately noted, given the breadth of outcome expectancies (e.g., self-conceptions of ability, task-specific self-concepts, expectancies of performance, ability self-appraisals, etc.), there is a conceptual ambiguity in this motivational construct. As Kirsch (1995) mentioned, when personal outcome expectancies are conditional on skills, as is the case with the present performance-related contexts and task, the distinction between self-efficacy and personal outcome expectancy becomes less clear. Finally, given the conceptual ambiguity and the fact that outcome expectancies may inform self-efficacy beliefs (Williams, 2010), I did not include this motivational construct in any sub-study.

In addition to the above, it ought to be noted that self-efficacy judgments and specifically, academic self-efficacy, are distinguished from other related self-referent constructs (Schunk & DiBenedetto, 2016). For example, mathematics self-concept, defined as students' knowledge and perception of their competence in mathematic academic circumstances (Ferla et al., 2009; Skaalvik & Skaalvik, 2006), is conceptually, operationally, and empirically distinct from mathematics self-efficacy. The distinction is that self-efficacy is a self-judgment of confidence in one's capability to do well in mathematics. Additionally, academic self-efficacy is also distinct from academic self-esteem (Bandura, 1997) since the latter construct taps into individuals' positive and negative affective attitudes toward academic subject- domains (Orth & Robins, 2022; Rosenberg et al., 1995). Self-esteem is primarily an affective self-judgment of self-worth (Orth & Robins, 2014; Schunk & DiBenedetto, 2016), instead of a cognitive self-evaluation of capability. Nevertheless, self-efficacy and self-concept have been found to be highly correlated ( $r=.93$ ), suggesting that there is multicollinearity when both constructs are modelled together (Marsh et al., 2004). Thus, I included in the quantitative studies only self-efficacy measures to avoid high correlations between the two self-referent constructs.

When making reference to students' learning processes and achievement, self-efficacy is referred to as academic self-efficacy. Academic self-efficacy is linked with a particular subject- domain and reflects students' confidence to achieve in a specific subject (e.g., maths) (Ferla et al., 2009). The primary sources of people's self-efficacy are enactive mastery experiences, vicarious experiences, social persuasion, and affective states (Bandura, 1997). Hence, in the school context, mastery experiences are defined as previous achievements; that is, students who received great scores in the past, will have greater self-efficacy (Margolis & McCabe, 2006; Usher & Pajares, 2008). Vicarious experiences are in essence a social comparison process. In other words, students' academic self-efficacy is developed through observing other students' performance. Students that observe other classmates' success in a specific subject may become convinced that they can succeed too (Joët et al., 2011; Margolis & McCabe, 2006). Another source of students' self-efficacy is social persuasion which involves receiving positive feedback from peers, parents, and teachers. This source may be particularly important especially when students are unfamiliar with the academic task or are not convinced of their abilities (Usher & Pajares, 2008). Thus, this feedback has been shown to be extremely influential in shaping students' self-efficacy beliefs (Joët et al., 2011). The final source of self-efficacy is affective states, such as anxiety, enjoyment, and arousal (Usher, 2009b). Sources of self-efficacy are shown in Figure 8.

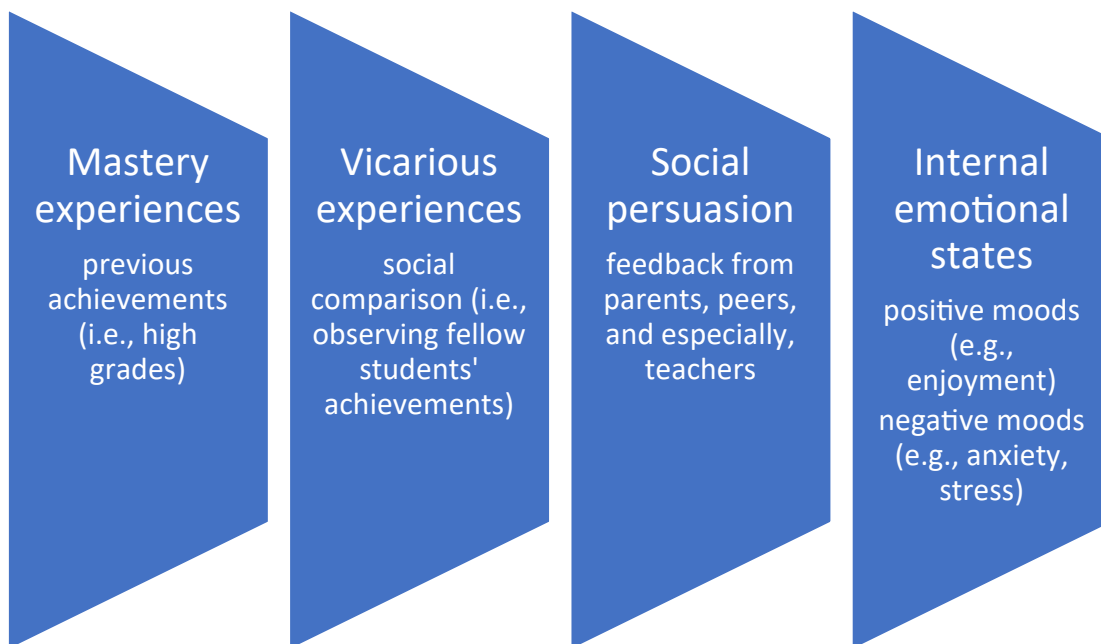


Figure 8. Sources of self-efficacy © The Author

In short, the literature indicates that self-efficacy beliefs are crucial for individuals' self-regulated behaviour; that is, students with high self-efficacy display greater self-regulation, positive thinking, and perseverance, set more challenging goals (Usher & Schunk, 2018), and are, in general, greatly motivated (Zimmerman, 2002).

Beyond self-efficacy beliefs, Zimmerman's model of self-regulated learning involves another type of motivational processes called learning goal orientations. Thus, in the following section, I present some theoretical information on goal orientations.

### 2.3.2. Goal orientations: Students' reasons to engage with tasks

Many types of goals have been derived from achievement motivation research (Eccles & Wigfield, 2002). Generally, a goal is defined as an outcome or a behaviour that a person is intentionally seeking to achieve and goals are considered to be cognitive reflections of humans' needs and drives (Schunk et al., 2014). The connotation "achievement goal orientation", however, refers to the reasons of achievement behaviour and is more precisely defined as a combination of opinions, attributions, and emotions that results in intentional behaviour and is reflected in different ways in which individuals engage with, approach, and respond to achievement-related tasks or activities (Ames, 1992). According to Elliot and Hulleman (2017), theorists in the achievement goal field disagree on how to best define the term 'goal'. What they agree on is that goals represent purposeful behaviour but some define the 'goal' as the aim (a final outcome state that drives learning behaviour) or as the reason why learners engaged in a task (Elliot & Thrash, 2001).

Two broad branches of theoretical perspectives on goals are quite prominent, namely Goal Content theories and Goal Orientation theory (Schunk et al., 2014). The former type of theoretical approaches aims to understand the motives for human behaviour in general (Schunk et al., 2014), whereas goal orientation theory attempts to explain specifically attainment behaviour. It ought to be noted that learning goal orientations integrate both cognitive and affective cues (Ames, 1992) compared to self-efficacy beliefs, which are shaped more by social and cognitive cues (Bandura, 1997). In the past decades, many researchers have conducted studies on students' learning goal orientations with some

prominent theorists being Ames (Ames, 1992; Ames & Archer, 1988a), Dweck (Dweck, 1986; Dweck & Leggett, 1988), Nicholls (Nicholls, 1984), amongst others.

Although initial definitions of achievement goals varied to some extent, all definitions covered common ground as will be shown below. For example, Nicholls (1984) made a distinction between task- and ego-involved goals. When students adopt a task-involved goal, they perceive that increased effort results to greater achievement and competence (Kaplan & Maehr, 2007; Nicholls, 1984). These task-involved students prefer learning tasks that are highly probably to require high effort, which maintains a balance between high probability of displaying low ability and low probability of displaying high ability (Nicholls, 1984). Students adopting an ego-involved goal display their level of ability conditionally on the ability of others, which indicates that demonstration of competence is depending on normative standards (Nicholls, 1984).

Another parallel strand of achievement goal research was developed by Dweck and colleagues in the 70s. This research project began by identifying a distinction between adaptive and maladaptive responses. The main defining feature of the maladaptive/helpless pattern of cognition- affect- behaviour was an avoidance of challenges and decrease in academic achievement when faced with difficulties (Dweck & Leggett, 1988). The individuals with the adaptive pattern were usually characterised by actively searching for challenging learning activities and perseverance in the face of difficulty (Dweck, 1986; Dweck & Leggett, 1988). Surprisingly, the individuals with maladaptive patterns of cognition-affect and behaviour during learning had similar levels of IQ compared to those with adaptive patterns of learning (Dweck & Leggett, 1988; Dweck & Yeager, 2019). This distinction led Dweck (1986) to distinguish between two types of goals, called learning and performance goals.

Ames' (Ames, 1992; Ames & Archer, 1988a) work on goal orientations follows the development of the field but contributes greater information about the functioning of goal orientations in real-world classrooms instead of laboratory settings. Because of the different terms used by the various authors, Ames and colleagues (Ames & Archer, 1988a) suggest the terms mastery and performance goal orientations. The first connotation is used to describe learning goal, task-focused, and task-involved goals, whilst the second term encompasses all previous definitions of ego-involvement, ability-focused, and performance

goals. Ames and Archer (1988) have associated several classroom features with mastery and goal orientation, which is shown in Table 2.

Table 2. Associations between goal orientations and classroom features

Classroom features	Mastery goal	Performance goal
Success defined as...	Improvement, progress	High grades, high normative performance
Value placed on...	Effort/learning	Normatively high ability
Reasons for satisfaction...	Working hard, challenge	Doing better than others
Teacher oriented toward...	How students are learning	How students are performing
View of errors/mistakes...	Part of learning	Anxiety eliciting
Focus of attention...	Process of learning	Own performance relative to others'
Reasons for effort...	Learning something new	High grades, performing better than others
Evaluation criteria...	Absolute, progress	Normative

Note: Table adopted from © Ames and Archer (1988)

Nowadays, there is a common agreement that mastery goal orientation is observed when students focus on mastering an academic task in order to increase their competence, whereas performance goal orientation is endorsed when students seek to reduce the negative and increase the positive evaluations of their competence (Eccles & Wigfield, 2002; Wigfield et al., 2015). Students who choose mastery goals are interested in increasing their competence by opting for more challenging tasks, whilst students who choose performance goals seek to outperform others and select tasks more familiar to them (Eccles & Wigfield, 2002; Schunk et al., 2014).

Beyond the above distinctions between mastery and performance goals, the field of achievement goal theory has also coined the concept of the valence of competence (M. Lee & Bong, 2019). Valence of competence indicates here the potential of approaching success or the negative potential of avoiding lack of success (M. Lee & Bong, 2019). This has led to the introduction of the trichotomous model of achievement goals (Elliot & Hulleman, 2017; Elliot & Thrash, 2001). The trichotomous model splits the performance goals into performance-approach goals and performance-avoidance goals (Elliot & Hulleman, 2017).

Performance-approach goals refer to a positive valence of competence defined in normative terms, such as wanting to outperform others (Elliot & McGregor, 2001). Performance-avoidance, on the other hand, encompasses a negative valence of competence defined in normative terms, such as wanting to avoid achieving worse than others (Elliot & McGregor, 2001). Later on the trichotomous model of achievement goals was reformulated into the 2 x 2 model, wherein mastery goals were also divided into mastery-approach and mastery-avoidance (Elliot & McGregor, 2001; Elliot & Murayama, 2008). The first category was defined as mastering and learning the subject's content as thoroughly as possible, whereas the latter construct reflects the probability of not mastering and learning the content as much or learning without completely comprehending (M. Lee & Bong, 2019).

Despite the above developments in achievement goal theory, empirical and meta-analytic research studies have shed doubt on the salience of all these distinctions between different facets of achievement goals with regards to academic achievement. For instance, Lee and Bong (2016) having conducted a multi-study with middle school students reported that mastery-avoidance goals were not reported by the students and the vast majority of the students' responses were not represented by the 2 x 2 goals framework. The 2 x 2 framework accounted for 26.6% of the proportion of responses (M. Lee & Bong, 2019). The meta-analytic work by Huang (2012) indicated that the criterion validity of the different achievement goals with academic achievement could only be characterised as rather weak. For example, performance goals were not correlated with academic achievement, whereas mastery goals had a rather weak correlation of .13. Performance-approach goals were also weakly correlated with academic achievement, i.e., .07, whereas the effect size was also small for performance-avoidance, i.e., -.12 (Huang, 2012). Finally, the aggregated correlations between mastery-approach and mastery-avoidance with academic achievement were rather small, namely .10 and -.11, respectively (Huang, 2012). Similar weak bivariate correlations between the 2 x 2 achievement goals and academic achievement were reported in another more recent meta-analysis (Wirthwein et al., 2013). Given the above conflicting evidence regarding the criterion validity (with regards to academic achievement) of the different combinations of achievement goals within the 2 x 2 and the trichotomous models, I avoid including all these different configurations in my studies.

Particularly in the context of the cyclical model of self-regulated learning (see Figure 6), an overall mastery goal orientation is considered an important feature for self-regulation. Thus, I include an overall mastery goal orientation in Study 2 (Chapter 5). Additionally, given the controversial evidence regarding the correlation of self-efficacy and performance-approach goals (for an overview see Huang, 2016), I estimate the association between these two factors in Study 1 (Chapter 4) to examine whether the association is positive and strong, negative or null.

### 2.3.3. Intrinsic and Extrinsic Motivation: A two-sided story of student academic motivation

Another very important self-motivational belief included in the cyclical model of self-regulated learning is intrinsic motivation and value (Cleary & Zimmerman, 2012; Zimmerman, 2002). In the framework of the cyclical model of self-regulated learning (Zimmerman & Moylan, 2009) intrinsic interest and value could be approached either through the theoretical lens of self-determination theory (Ryan & Deci, 2000b) or through the lens of expectancy-value theory (Eccles & Wigfield, 2020; Wigfield & Eccles, 2000). In the current thesis, I am influenced by the self-determination theory approach to intrinsic motivation (Ryan & Deci, 2000b, 2016, 2020). The selection of self-determination theory as the theoretical foundation for my operationalisation of the concept of intrinsic motivation was based on the following reasons. The main model of the (situated) expectancy-value theory incorporates constructs from numerous theories (e.g., attribution, personality, life-course etc.) (Eccles & Wigfield, 2002, 2020) that are beyond the scope of the present study. Additionally, the situated expectancy-value theory blurs the distinction between self-efficacy and other expectancies for success and emphasise only domain-specific self-concept (Eccles & Wigfield, 2020), which is not in line with my adopted self-regulated learning models. Finally, the situated expectancy-value theory places emphasis on the momentary nature of the self-conceptions, tasks, values, and goals (Wigfield et al., 2021), which implies a longitudinal rather than cross-sectional perspective. Hence, the self-determination approach to intrinsic and extrinsic motivation was deemed more appropriated for the current study.

Self-determination theory is a macro-theory of human motivation, well-being, self-regulation, personality, basic psychological needs, amongst others (Deci & Ryan, 2008). In the current project, I am only interested in the theoretical tenets of self-determination theory regarding motivation. According to the fathers of self-determination theory, there are two different categories of motivation, called intrinsic and extrinsic motivation (Ryan & Deci, 2000a, 2020).

Intrinsic motivation refers to being moved to do something because it is inherently interesting, enjoyable, and self-satisfying (Ryan & Deci, 2000a). Ryan and Deci (2000b) place significant emphasis on intrinsic motivation by suggesting that there is perhaps no other psychological phenomenon that can describe the “positive potential of human nature” (p. 70). The benefits of intrinsic motivation are many. For example, a fairly recent meta-analysis reported that intrinsic academic motivation was associated with better concurrent and prospective academic achievement in school (Taylor et al., 2014). Higher intrinsic motivation has also been associated with better metacognitive (Katsantonis, 2020) and motivational (Rawsthorne & Elliot, 1999; Walker et al., 2006) outcomes. Cognitive evaluation theory, which is a mini-theory of self-determination theory (Deci & Ryan, 1985), suggests that parameters of the social context can induce intrinsic motivation through increasing perceptions of competence (self-efficacy) (Ryan, 1982; Ryan & Deci, 2000a). Such parameters of the social environment that have been studied are, amongst others, feedback, communication, and rewards (Ryan & Deci, 2000a).

On the other hand, extrinsic motivation is defined as doing an activity because it can lead to a desirable outcome (Ryan & Deci, 2000a). Extrinsically motivated students are motivated due to instrumental reasons such as rewards, incentives, punishments, focus on approval from others (Ryan & Deci, 2020). Extrinsic motivation is not homogenous, however, since there are several types of instrumental reasons why one could be motivated (Ryan & Deci, 2020). According to the theory individuals can pass through four stages of extrinsic motivation through a process called internalisation to reach intrinsic motivation (Ryan & Deci, 2016). The four types/ stages of extrinsic motivation are as follows (see Figure 9). Rewards and externally controlled motivation have been called externally regulated extrinsic motivation, whilst being motivated in order to maintain high self-esteem has been called introjected extrinsic motivation (Ryan & Deci, 2020). Understanding the value and the

importance of an activity is called identified extrinsic motivation, whereas, understanding that the value of the activity is compatible with one’s interests and value is called integrated extrinsic motivation (Ryan & Deci, 2020). Ryan and Deci (2000) suggest that there is a possibility of individuals being characterised by complete lack of motivation, which is called amotivation.

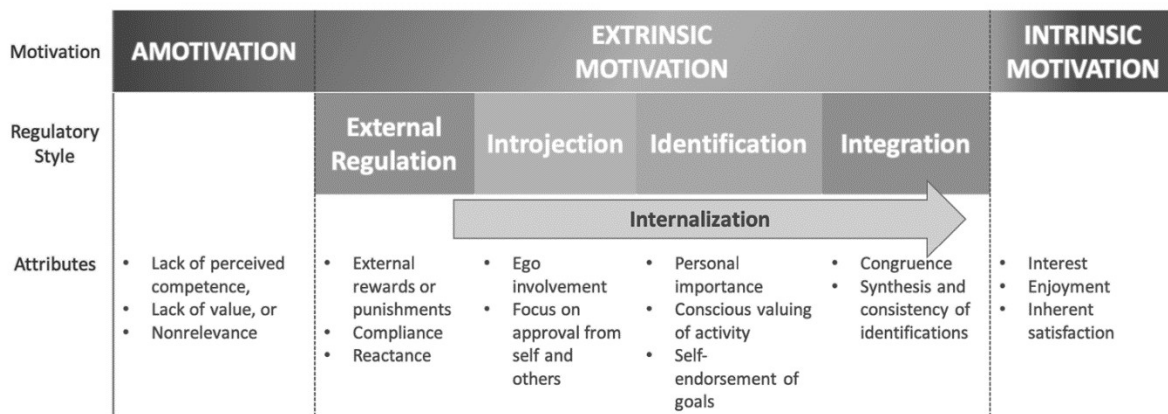


Figure 9. A continuum of motivation according to self-determination theory © Ryan and Deci (2020).

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Despite the above, empirical evidence examining the factor structure of the four-stage extrinsic motivation has revealed less than positive evidence (Guay et al., 2015). Most studies report unacceptable model-data fit according to current standards<sup>3</sup> (Barkoukis et al., 2008; Cokley et al., 2001; F. Li, 1999; Vallerand et al., 1992) and some called into question the validity of separating extrinsic motivation into four types given the high correlations between adjacent stages and unexpected criterion validity (Barkoukis et al., 2008; Fairchild et al., 2005). Nevertheless, given that self-regulated learning models clearly state that students can self-regulate their extrinsic motivation (Pintrich, 2000b; Zimmerman & Martinez-Pons, 1988) by promising themselves rewards, for example, I include some questions on extrinsic motivation (specifically, instrumental value, which is an example of identified and integrated motivation) in all empirical studies (Chapter 4, Chapter 5, and

<sup>3</sup> Current standards include CFI and TLI values above .95 and RMSEA values below .06 and SRMR below .08. The combination rule or two-index strategy involves CFI ≥ .95 and SRMR ≤ .08. See Kline (2023) for further details.

Chapter 6) but do not make distinctions between different types given the less optimal reported validity results.

However, the question remains what is the relation between intrinsic and extrinsic motivation since I include both aspects of motivation into my empirical studies. Early self-determination theory accounts indicated that extrinsic motivation undermined intrinsic motivation (Ryan & Deci, 2000b, 2016). In a meta-analysis of 96 experimental studies, Cameron and Pierce (1994) showed that rewards and reinforcement did not decrease intrinsic motivation, instead praise seemed to boost intrinsic motivation. Only a small negative effect appeared when tangible rewards were utilised (Cameron & Pierce, 1994). Later meta-analyses indicated that all types of rewards had deleterious effects on children's and adults' intrinsic motivation (Deci et al., 1999, 2001); however, positive feedback boosted intrinsic interest (Deci et al., 1999). Although the relation between intrinsic motivation and rewards remains an actively researched issue, there is less, if at all, evidence regarding the nature of the association between identified and integrated aspects of motivation and intrinsic motives. From my experience, there is no formal system of tangible rewards and punishments in Greek secondary schools regarding students' learning<sup>4</sup>. Hence, extrinsic motivation operationalised as punishment lies beyond the scope of the present thesis.

Despite the above debate, contemporary self-determination theory perspectives clearly underscore that individuals can hold simultaneously multiple motives (Litalien et al., 2017; Ryan & Deci, 2020). For example, studies have shown that individuals can be both intrinsically and extrinsically motivated (Guay et al., 2015; Litalien et al., 2017). This is further supported by a recent meta-analysis of 40 years of empirical works illustrating that the impact of intrinsic motivation on performance was not eroded by the presence of extrinsic rewards suggesting that intrinsic motivation and incentives do not have to be antagonistic but can be additive (Cerasoli et al., 2014). Additionally, empirical studies have also shown that indicators of intrinsic and instrumental extrinsic motivation are positively correlated (Ilishkina et al., 2022; Yildirim, 2012). Therefore, it is important to examine whether adolescent students can hold both intrinsic (interest, enjoyment) and extrinsic

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<sup>4</sup> One could think of increased grades as tangible rewards and decreased grades as 'punishment' measures; however, achievement is the outcome of the current study and is not a manipulated experimental variable. Hence, I do not think it is reasonable to treat achievement outcomes as rewards or punishments since I assume that there is probably no intentionality in teachers' use of the grades beyond reflecting achievement standards.

(instrumental value, utility) motives. A second objective is to understand whether and how both types of motivational forces are predictive of academic achievement in the low-performance context of Greek education.

#### 2.3.4. Relations between motivational beliefs

Beyond the above, extant empirical evidence has examined specific components of students' motivational beliefs in isolation, without merging multiple parallel strands of theoretical research under a unified framework. Existing studies have often reported different conclusions regarding the predictive relations between students' motivational beliefs.

For example, Cleary and Kitsantas (2017) proposed a model, wherein task interest predicted self-efficacy, which, in turn, predicted math grades. However, other important motivational variables were not considered in that model. Keskin (2014) also examined a mediation model with middle school students and found that the effect of metacognitive knowledge of reading strategies on task value- a motivational variable- was mediated by self-efficacy. Despite these findings, the Keskin (2014) study did not examine the associations of these constructs with achievement. Skaalvik and Skaalvik (2006) examined multiple mediation models using a sample of middle school and high school students. Their modelling results illustrated that the effect of self-perception- conceptualised as self-efficacy and self-concept- on students' mathematics achievement was mediated neither by interest in mathematics nor by goal orientations. This study though did not test alternative models whereby self-efficacy could have served as a mediator instead of as an exogenous variable.

Some other studies have also suggested that self-efficacy was associated with goal orientations (i.e., performance and mastery) (Ilshkina et al., 2022; Roeser et al., 1996), but the direction of the predictive relation between these motivational beliefs is unclear. Specifically, some studies suggest that goal orientations predict self-efficacy (Coutinho & Neuman, 2008; Midgley et al., 1998), whereas other studies, based on the revised trichotomous model of goal orientations (Elliot & Hulleman, 2017), suggested that self-efficacy predicted goal orientations (Diseth, 2011; Putarek & Pavlin-Bernardić, 2020; Skaalvik & Skaalvik, 2006). Of particular notice is the meta-analysis of Huang (2016) which showed a negative but not significant correlation between self-efficacy and performance

goals, performance-avoidance, and performance-approach goals. On the other hand, one of the few empirical studies based on Greek elementary school samples, showed that both mastery and performance goals were positively predicting mathematics self-efficacy, which in turn predicted intrinsic and instrumental motivation, and all these motivational variables with the exception of mastery goals were predictive of metacognitive self-regulatory strategies (Chatzistamatiou et al., 2015).

There is also quite inconclusive evidence regarding the interplay of self-efficacy and intrinsic motivation (enjoyment, interest, intrinsic satisfaction - Ryan & Deci, 2020). A portion of empirical investigations estimated a positive (either directly or indirectly) predictive effect from self-efficacy<sup>5</sup> to intrinsic motivation (Buff, 2014; Putwain et al., 2013, 2016; Simonton & Garn, 2020; Skaalvik et al., 2015). Nevertheless, there is also another strand of research studies that report a flow of predictive effects from intrinsic motivation to self-efficacy (An et al., 2021; J.-C. Hong et al., 2017; Villavicencio & Bernardo, 2016; M. Y. Yi & Hwang, 2003). Taken together, these contradicting findings indicate that examining the predictive order between self-efficacy and intrinsic motivation merits further study and can be a contribution to long-standing debates about the nature of these relations.

The above conflicting evidence and omissions of important variables suggest that further studies on the interplay between self-efficacy, goal orientations, intrinsic motivation (as well as extrinsic motivation), and achievement are needed. Recognising that the relations between these motivational factors are yet unclear, I conceptualised and tested a relevant multi-equation predictive model of these relations (Study 1, Chapter 4). Understanding how these factors are interlinked could help educationalists and educational policy-makers to design effective interventions by targeting specific components of self-regulation that are known to have a positive influence on students' achievement.

## 2.4. Variable-centred versus person-centred approaches

A major limitation of previous studies on achievement motivation, self-regulation of learning, and achievement (e.g., Callan & Cleary, 2019; Cleary & Kitsantas, 2017; Coutinho &

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<sup>5</sup> Some of these researchers conceptualise self-efficacy within the framework of control-value theory of academic emotions, whereby self-efficacy, along with self-concept and outcome expectancies, are considered aspects of control-related appraisals and beliefs (Simonton & Garn, 2020).

Neuman, 2008; Katsantonis, 2020; Skaalvik et al., 2015) is that they have opted for a variable-centred approach. Variable-centred approaches explore the links between personal processes and academic achievement that are assumed to be “averaged” across all sample members (i.e., a single coefficient summarises the relation) (Laursen & Hoff, 2006; B. Muthén & Muthén, 2000). In contrast, the person-centred approach is an individual-level perspective that treats students holistically and seeks to reveal, compare, and contrast naturally occurring groups of students that share similar characteristics within-group but are more dissimilar from students from another group (D. Bauer & Shanahan, 2007; Morin et al., 2016). Such naturally occurring subgroups of students within an overall sample are forming a single population that is divided in distinct groups, as shown in the Figure 10 below. The person-centred approach can also be used to test the interactive relations between the different motivational and metacognitive processes that take place primarily within individuals (D. Bauer & Shanahan, 2007; Lanza et al., 2010; Merz & Roesch, 2011). For example, as discussed in section 2.2.2., the metacognitive and affective model of self-regulated learning indicates the presence of interactive effects between students’ motivation and metacognitive knowledge and self-regulation (Efklides et al., 2018); however, these interactive effects are seldomly empirically examined. Hence, the person-centred approach could actually shed light onto how the higher-order multiplicative effects between the various motivational beliefs and metacognitive self-regulation are predictive of academic achievement.

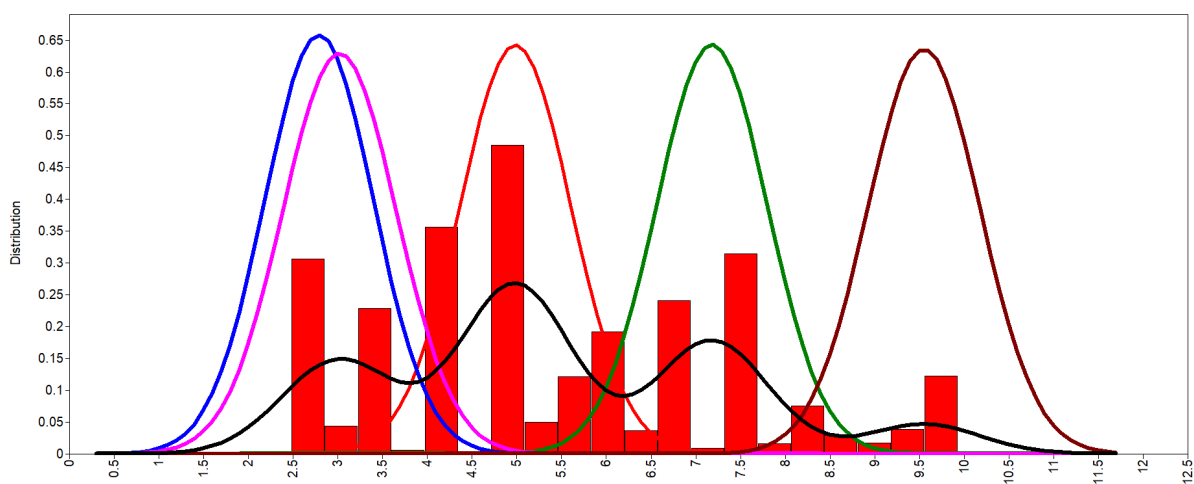


Figure 10. A mixture of different populations showing heterogeneity. © The Author

Note: Black line denotes overall population, whereas red, green, brown, blue, and pink lines denote different subpopulations.

Some person-centred studies of motivation and self-regulation strategies exist, however, a significant portion of these studies are focused on university/college students (e.g., Broadbent & Fuller-Tyszkiewicz, 2018; Dörrenbächer & Perels, 2016; Hong et al., 2020). However, from a theoretical point of view, it is more important to examine individual differences in motivation and self-regulation during adolescence, when academic motivation usually declines (Fredricks & Eccles, 2002; Gottfried et al., 2001, 2007; Wigfield et al., 2015), whilst metacognitive self-regulation and knowledge becomes more refined (Veenman et al., 2006; Weil et al., 2013). Thus, in the present dissertation, I examine heterogeneity in motivational beliefs and self-regulation of adolescents. This line of research provides new insights into the synergistic nature of the relations between motivation and self-regulation.

It ought to be noted that extant studies have been conducted in educational systems (e.g., UK, USA, Germany, China) that are highly performing according to international surveys of cognitive skills (OECD, 2016a, 2019b). Yet, there is a paucity of empirical evidence coming from lower performing educational systems, such as Greece's. Therefore, my project offers new evidence from less well-researched contexts, too.

## **2.5. Self-regulated learning and academic achievement**

Self-regulated learning has important implications for academic achievement. Self-regulated learning accounts of learning emphasise students' agency in learning environments and planning and controlling of their own instruction (Zimmerman, 1990a). However, I have not yet described the link between self-regulated learning and academic achievement. Thus, I devote this section to address the issue of the connections between self-regulated learning and academic achievement.

A recent meta-analytic structural equation modelling of 126 studies examined the impact of self-regulatory strategies interventions on academic achievement and revealed that the path from self-regulatory strategy interventions to academic achievement was

rather weak  $\beta=.18$  (R. S. Jansen et al., 2019). This might suggest that failing to include motivational self-beliefs into predictive models of achievement is telling half the story.

Another meta-analysis of correlational evidence examined the links between cognitive and metacognitive self-regulatory strategies and reported that the average correlation coefficient effect size was higher in the case of metacognitive self-regulation ( $r=.20$ ) compared to cognitive self-regulation ( $r=.11$ ) (Dent & Koenka, 2016). This finding indicates that it is more important to consider the relations between the metacognitive aspect of self-regulated learning and students' motivational self-beliefs in the prediction of academic achievement.

A relevant meta-analysis that is of great importance is that of Richardson et al. (2012). These researchers examined how seven clusters of variables were associated with college students' performance. These groups of variables were the following: motivation (e.g., self-efficacy, goal orientations, etc.), personality (e.g., Big 5 traits), approaches to learning (deep versus shallow), psychosocial context (e.g., social support, stress, etc.), self-regulated learning strategies (e.g., metacognition, effort regulation, cognitive strategies, etc.), previous achievement, and demographic variables (e.g., sex). Richardson et al. (2012) reported that academic self-efficacy ( $r=.31$ ) and performance self-efficacy ( $r=.59$ ) were the strongest correlates of academic achievement, whilst intrinsic motivation ( $r=.17$ ), mastery goal ( $r=.10$ ), performance goal ( $r=.09$ ) were rather weak correlates, amongst others. In line with other meta-analytic work regarding self-regulated learning strategies, Richardson et al. (2012) found that metacognition ( $r=.18$ ), test anxiety ( $r=-.24$ ), organisation ( $r=.04$ ), rehearsal ( $r=.01$ ), elaboration ( $r=.18$ ), help seeking ( $r=.15$ ), peer learning ( $r=.13$ ), time/study management ( $r=.22$ ), and concentration ( $r=.16$ ) were all rather weak<sup>6</sup> correlates of academic achievement. One can confidently say that the findings of the Richardson et al. (2012) meta-analysis regarding the links between motivation, self-regulated learning, and achievement are compatible with the evidence collated by the other meta-analyses reviewed above.

All in all, the evidence provided by the above meta-analyses suggest that self-regulated learning strategies are rather weak correlates of academic achievement given the small to moderate effect sizes reported in Dent and Koenka (2016), R. S. Jansen et al. (2019),

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<sup>6</sup> According to J. Cohen (1988), correlation effect sizes are interpreted as weak if they are below  $|.30|$ , medium if range between  $|.30|$  and  $|.50|$ , and large if they range between  $|.50|$  and  $|1|$ .

and Richardson et al. (2012). Amongst the many self-regulated learning strategies evaluated in the above meta-analyses, meta-cognitive self-regulated learning strategies (planning, monitoring, evaluating/ correcting) appeared to be more strongly correlated with academic achievement (Dent & Koenka, 2016; Richardson et al., 2012). Therefore, I place significant emphasis on metacognitive self-regulatory strategies. Last but not least, according to the Richardson et al. (2012) meta-analysis, motivational factors, and, especially, self-efficacy beliefs might be more important features of learning given the particularly salient correlations with academic achievement. Thus, motivational aspects of self-regulated learning deserve more emphasis while predicting academic achievement.

Despite the above, I note that some of the above meta-analyses were referring to college/ university students and, therefore, their results may not be applicable to secondary school students. Finally, not all of the above meta-analyses included academic motivation, which is a significant shortcoming.

Having discussed the role of self-regulated learning (motivation and metacognition) in promoting academic achievement, I now turn to important contextual-environmental influences on students' academic achievement (see conceptual framework section 2.1. Social-cognitive theory perspective on students' academic achievement). Hence, in the following sections 2.6, 2.7, and 2.8., I describe the role of teachers' feedback, the role of parental expectations, and peer influences.

## **2.6. Feedback processes underpinning students' motivation and academic achievement**

Having explored conceptually the importance of motivation and metacognition for adolescent students' academic achievement, I turn next to the contextual factors. Hence, in the next sections, I will be discussing the connections between the different contextual factors, that appear in my conceptual framework (see section 2.1.), and academic achievement.

As social cognitive theory (Bandura, 1997) would suggest that individual-level factors are not sufficient to explain achievement and learning behaviours, I need to consider how

environmental/ contextual factors influence students' academic achievement. As I mentioned earlier in the overall conceptual framework of the thesis (section 2.1. Social-cognitive theory perspective on students' academic achievement), teacher's feedback is part of the present research project and, therefore, the present section is devoted to the mechanism of feedback.

Teachers' instructional behaviours have been reported to be related to students' academic achievement and metacognition (Caro et al., 2016; Kyriakides et al., 2020). Teacher's feedback is considered an instructional strategy that has been strongly connected to students' achievement (Hattie & Timperley, 2007; Wisniewski et al., 2020). Feedback is not only important for learning but has also been found to be a critical factor that contributes to students' motivation and self-regulated learning strategies. In fact, models of self-regulated learning place specific emphasis on the importance of feedback for self-regulated learning (D. L. Butler & Winne, 1995). Zimmerman and Moylan (2009) mention that students' processing through the self-regulatory cycles (forethought motivational, performance, and self-reflection) are conditional on the frequency and the timing of internal feedback (i.e., self-awareness of mental, physical, and behavioural signals) that is susceptible to external feedback from parents, peers, and teachers, as well as from context-specific signals. Therefore, this points out the need to examine whether and how teachers' feedback is associated with aspects of students' self-regulated learning above and beyond academic achievement.

Feedback is generally defined as an action or information provided by another person (e.g., teacher, peers, parents) with respect to one's achievement and/or comprehension and is aimed to bridge the gap between the achieved level of performance or understanding and expected level of performance or understanding (Hattie & Clarke, 2018). Several types of feedback have been identified in the literature such as feedback through comments, grades, correction, explanation, reflection, or normative (i.e., comparisons with others or set standard) (Hattie & Clarke, 2018). In the context of a classroom learning environment, teachers' feedback can be convergent (i.e., attempting to draw correct responses and note errors made by the students) or divergent (i.e., more focused on motivating students to refine their thinking about the subject or learning process and task) (Hargreaves, 2013). According to another taxonomy according to Van der Kleij et

al. (2015), the types of feedback can be classified into three broad categories such as “knowledge of results”, “knowledge of correct response”, and “elaborated feedback”. The “knowledge of result” type of feedback provides an indication of whether the answer to the problem/ task is correct or not but does not offer the correct answer or any other information (Van der Kleij et al., 2015). The aim in the case of knowledge of result feedback is to provide behavioural reinforcement similar to behaviourist learning (Van der Kleij et al., 2015). The “knowledge of correct response” type is linked to the cognitivism paradigm and aims to correct students’ incorrect responses by indicating which answer is the expected correct response (Van der Kleij et al., 2015). Finally, “elaborative feedback” can also be called “formative feedback”. According to Shute (2008), the two distinctive features of formative feedback is verification and elaboration. Verification involves providing a “knowledge of result” judgement in terms of whether the answer is correct or not followed by elaboration which is a provision of information to the learners to help them reach the correct answer (Shute, 2008). Shute (2008) concluded her review by stating that formative feedback is conditional on students’ motivation (whether the student needs it), opportunity (whether the feedback is timely), and means (whether the student is a willing recipient).

Although one would expect teachers’ feedback to be a positive correlate of students’ academic achievement, there is substantial evidence coming from multiple educational and cultural contexts indicating that teachers’ feedback may not always have a positive influence on students’ learning and, subsequently, achievement. The possibility of the negative impact of feedback has largely been overlooked in the literature (Shute, 2008) and, in fact, it is less likely to be found in published articles (Wisniewski et al., 2020) which makes it impossible to evaluate what the potential mechanisms are that might ameliorate the impact of a possible negative effect of feedback on achievement.

A recent meta-analysis (Wisniewski et al., 2020) of 435 empirical studies explored the impact of feedback on several student outcomes (motivation, cognition, physical, and behavioural). The overall meta-analytic effect size was  $d=.48$ ; however, Wisniewski and colleagues (2020) also explored the effect of feedback on each cluster of student outcomes separately and found that feedback had greater beneficial effect on cognitive (student achievement and effort) and physical (motor skills) outcomes and was less effective for motivational (intrinsic motivation, self-efficacy) and behavioural (discipline, behaviour in

class). This meta-analysis also found that 21% of the feedback effects on motivational variables were negative suggesting that feedback can decrease autonomy and self-efficacy when it takes the form of being negative, controlling, and less informative (Wisniewski et al., 2020). Regarding the feedback type, the meta-analysis of Wisniewski et al. (2020) illustrated that formative/ elaborative feedback had the greatest impact ( $d=.99$ ) followed by corrective feedback (knowledge of results and knowledge of correct response) ( $d=.46$ ), whilst reinforcement (positive or negative) or punishment had a rather weak effect ( $d=.24$ ).

Another relevant meta-analysis examined the influence of three types of feedback (knowledge of results, knowledge of correct response, elaborative/ formative) on students' learning outcomes in a computer-assisted learning setting (Van der Kleij et al., 2015). The results of this meta-analysis illustrated that formative feedback had the greatest impact on students' learning outcomes ( $d=.49$ ), followed by knowledge of correct response feedback ( $d=.32$ ), whilst knowledge of results feedback had practically no impact at all ( $d=.05$ ) (Van der Kleij et al., 2015).

A smaller meta-analysis exploring the impact of graded (i.e., knowledge of results) versus comment (i.e., formative) feedback, indicated that receiving grades had a small negative impact on academic motivation<sup>7</sup> ( $d=-.08$ ) compared to receiving no feedback at all (Koenka et al., 2021). In contrast, receiving formative feedback through comments resulted in an overall small, but positive, impact on academic achievement ( $d=.32$ ) compared to receiving no feedback at all (Koenka et al., 2021). In comparison between knowledge of results and formative feedback, the meta-analysis reported that those students, who received formative feedback, had ( $d=.30$ ) higher academic achievement (Koenka et al., 2021). These findings indicate that the relations between feedback and academic motivation are perplexing and, thus, require greater study from both quantitative and qualitative perspectives to gain deeper insights into the mechanisms through which feedback is associated with increases or reductions in achievement and self-regulated learning.

Perhaps more important than the above meta-analytic evidence is the larger meta-analysis of Kluger and DeNisi (1996) that went beyond summarising the findings of empirical studies by presenting also conceptual models explaining how feedback behaviours were

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<sup>7</sup> Academic motivation was operationalised as intrinsic and extrinsic motivation, self-efficacy, self-esteem, self-worth, self-concept, mastery/ learning/ achievement goal orientation, and performance goal orientation, amongst others.

linked with task-specific motivation, achievement, and the self. These authors analysed 607 effect sizes regarding the impact of feedback interventions on performance and found that feedback was associated with an increase in average achievement with a small to moderate<sup>8</sup> effect size (Cohen's  $d=.41$ ) (Kluger & DeNisi, 1996). However, these authors also found that over 1/3 of the feedback interventions evaluated were associated with a decrease in achievement. After synthesising the empirical results, Kluger and DeNisi (1996, 1998) present the Feedback Intervention Theory (FIT) as a series of comprehensive explanatory conceptual models comprising three processes, namely task-learning (considered lowest-level), task-motivational (considered middle-level) and meta-processes (considered highest level) to explain how individuals perceive feedback and whether feedback could have a positive or negative consequences for learning and achievement. The overview of the theoretical model is presented in Figure 11 (Lipnevich & Panadero, 2021). The FIT model is the only model that has been based on an unprecedented extensive review and meta-analysis (including moderator meta-analysis (Lipnevich & Panadero, 2021)). Given its extensive nature, this model was considered appropriate to describe scenarios whereby feedback led to either positive or negative outcomes and was not necessarily confined to positive feedback outcomes. In the following paragraphs, I present the basic tenets and processes of the theory to assist in explaining the results of my empirical studies 1 and 3.

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<sup>8</sup> According to J. Cohen (1988), a  $d$  equal to .2 is considered small, a  $d$  equal to .5 is considered moderate, and a  $d$  effect size equal to .8 is considered large.

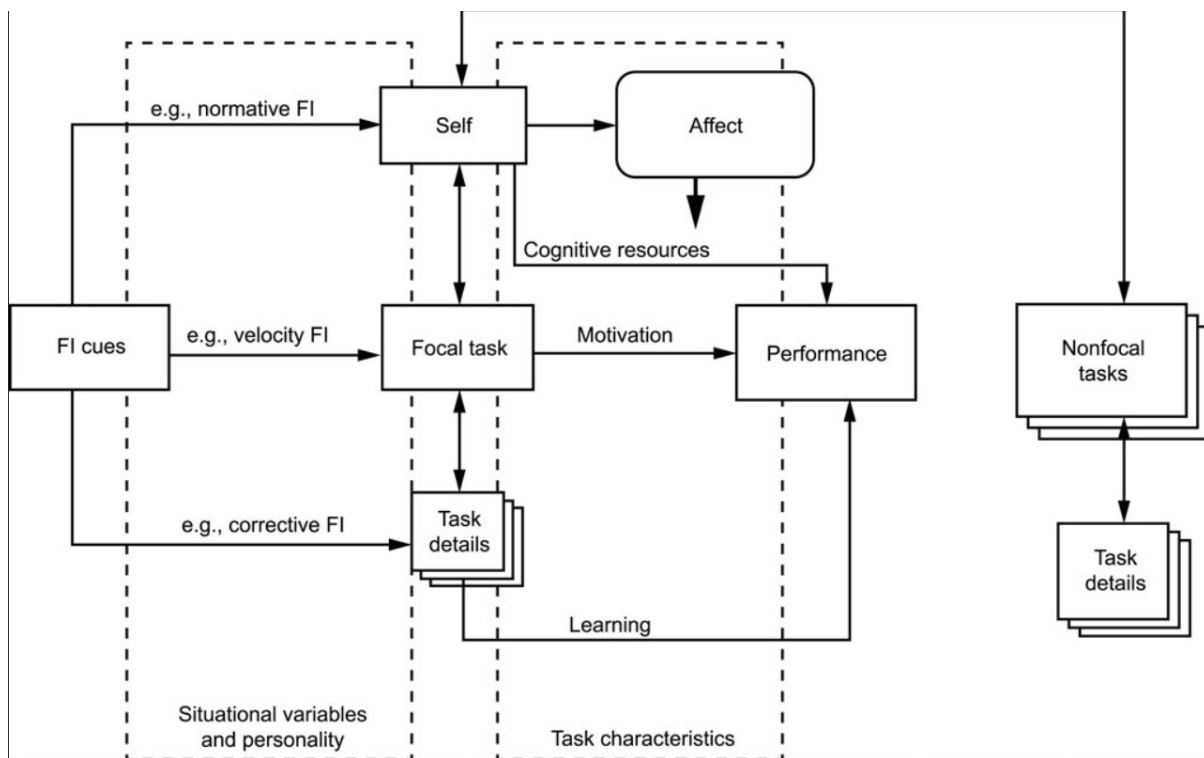


Figure 11. Overview of the feedback intervention theory © Kluger and Denisi (1998)

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The foundational tenet of the feedback intervention theory is the discrepancy or gap (King, 2016). Discrepancies occur when a self-regulating system identifies a distance/ gap between the received feedback and the standard or goal which is then driven to decrease the perceived discrepancies (Kluger & DeNisi, 1998). In educational practice, the perceived discrepancies, also called feedback-standard gaps, occur between student achievement and the achievement criteria set out by the teacher (C. D. Smith & King, 2004). Receiving feedback can activate a range of mental processes such as belief formation and re-structuring, assessment of new information, comparison of existing with prior knowledge and information, which are critical since they determine how feedback is perceived and processed (C. D. Smith & King, 2004).

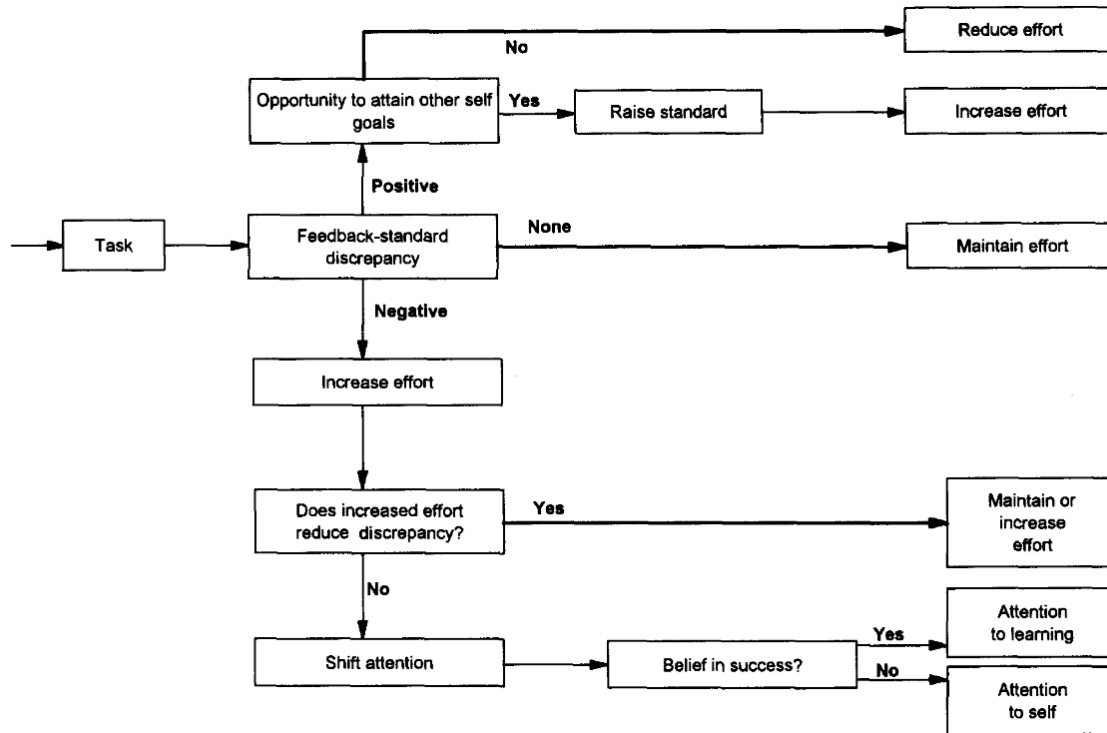


Figure 12. Conceptual model explaining the impact of feedback intervention-induced attention on task-motivation and its consequences for achievement © Kluger and DeNisi (1996)

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The first conceptual model (see Figure 12) aims to explain what are the effects of feedback on task-specific motivation (described as effort regulation) and its consequences for achievement. The theory (Kluger & DeNisi, 1996, 1998) suggests that given positive feedback there is no discrepancy between the feedback received and the standard level of performance for the task. The student may, then, perceive this as an opportunity to achieve other self-goals (i.e., self-esteem, control, impression management) which is likely to raise the student's standards and, subsequently, increase the effort invested. On the other hand, given positive feedback, a student may be satisfied with the achieved standard of performance and, thus, decrease effort (Kluger & DeNisi, 1996). However, if the feedback is negative, then students are likely to increase the effort invested in the task processing. In this instance, if the increase in effort is successful in reducing the discrepancy between the initially achieved (usually below-standard) task-performance and the expected standard

performance, then a student is likely to maintain or increase the effort invested (Kluger & DeNisi, 1996). If the discrepancy is not reduced, then a student is likely to shift attention towards lower-level processes, that is, task learning processes, or higher-level processes called meta-task processes (discussed below) (Kluger & DeNisi, 1996).

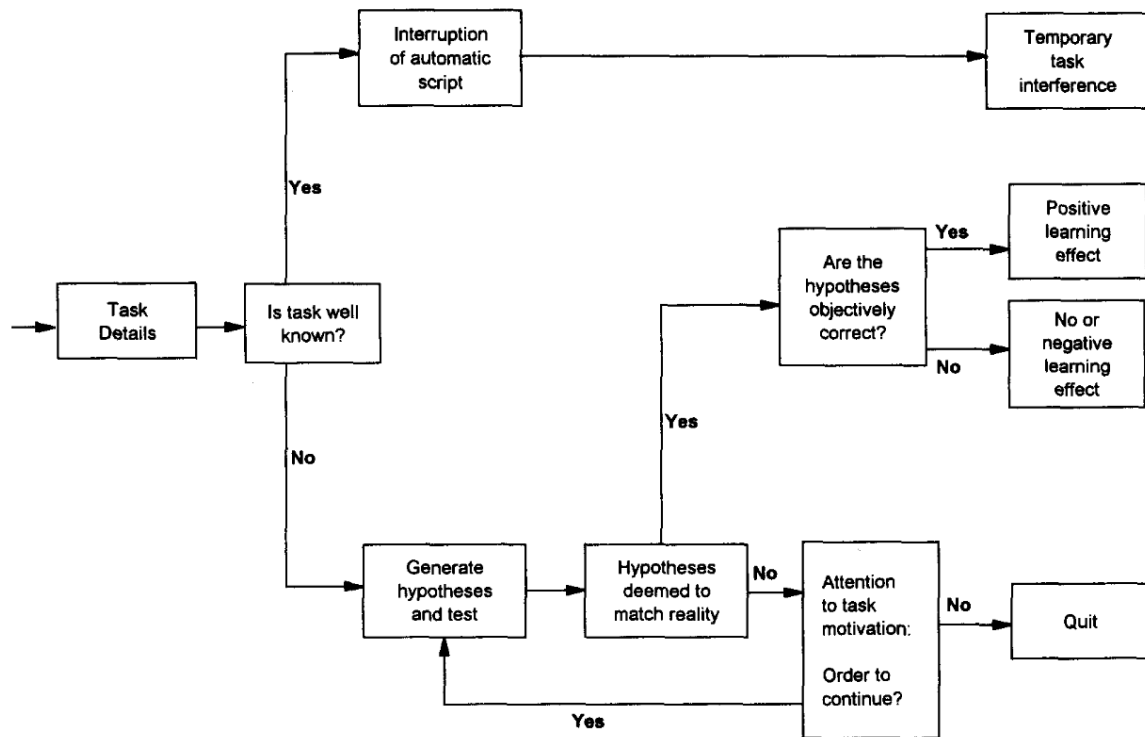


Figure 13. Conceptual model explaining the impact of feedback intervention- induced attention on task-learning processes and its consequences for achievement © Kluger and DeNisi (1996)

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Task learning processes (see Figure 13) lie at the bottom of the hierarchy of processes that comprise the feedback intervention theory (Kluger & DeNisi, 1996). However, these self-processes are triggered whenever the feedback-standard/goal discrepancy/ error cannot be resolved following the task motivation processes, extra effort is considered inefficient, and when the strategy to reduce the discrepancy aims to bring forth behavioural change (Kluger & DeNisi, 1996).

The first thing to do when individuals are confronted with an experience of perceived failure is to try and work harder to overcome obstacles (in this case, learning

obstacles); however, working harder on a (learning) task as a result of a motivational process requires automatic activation of strategies acquired by past (learning) experiences which also increase the demand in cognitive resources (e.g., memory) (Kluger & DeNisi, 1996). The basic premise of the task learning processes involves receiving and evaluating a feedback cue related to the features of the task (Kluger & DeNisi, 1996). If the task is considered well known and easy, then it is possible that the learning strategies may be subject to interruption, which might lead to short-term interruption to the task processing (Kluger & DeNisi, 1996). On the other hand, if the task is not well known, the learner is likely to generate some hypotheses that are used as a standard to evaluate whether the desired and expected level of performance has been achieved (Kluger & DeNisi, 1996). If the hypotheses are evaluated as realistic and are confirmed, then it is likely that feedback would have a positive effect on achievement; however, if the working hypotheses are not confirmed, then it is probable that feedback would have a negative impact on achievement (Kluger & DeNisi, 1996). During this process, the recipient of feedback is constantly monitoring whether the generated hypotheses are confirmed, leading, thus, to reduction of the discrepancy between feedback and standard or rejected (Kluger & DeNisi, 1996). If a generated hypothesis does not lead to the reduction of the discrepancy, then the recipient of feedback either quits the effort or persists in generating another hypothesis (Kluger & DeNisi, 1996).

The feedback offered and outcome of task processes may drive attention upwards in the hierarchy of processes and trigger meta-processes (see Figure 14), which involve four interrelated processes (Kluger & DeNisi, 1996). In the first instance, feedback may divert attention from the task to the self, whereby the task is evaluated for congruence with the self-goals (e.g., boosting impressions), and, thus, feedback may reduce or increase one's performance on a task depending on whether the task is cognitively demanding or not (Kluger & DeNisi, 1996). According to the theory, feedback can trigger emotional responses (unpleasant or pleasant) when the feedback is assessed for congruence with important personal self-goals (Kluger & DeNisi, 1996). If the task is considered critical for one's self-goals, then one's attention is diverted towards standards that "supervise" motivation to persist in a task, which, depending on the difficulty of the task, can lead either to achievement loss given the depleted cognitive resources due to attention switching or

increase in achievement due to lower cognitive load if the task is easy (Kluger & DeNisi, 1996).

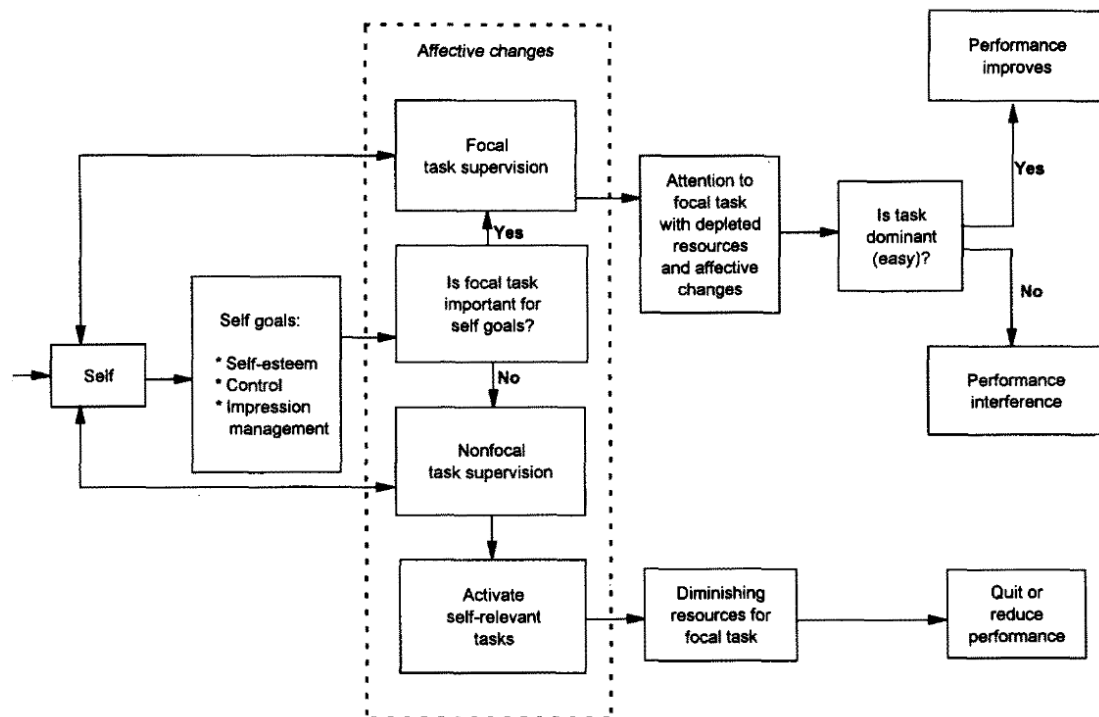


Figure 14. Conceptual model explaining the effects of feedback intervention-induced attention on meta-task processes and their consequences for achievement © Kluger and DeNisi (1996)

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To sum up the above information, feedback intervention theory emphasises the notion of a discrepancy or gap, wherein students, as a self-regulating system, come to realise that there is a distance between the feedback received and the desired goal or the expected standard. This perceived discrepancy encourages students to bridge the difference between the end goal and the initial performance. In an educational context, such as classrooms, this discrepancy will take the form of a student's achievement and the criteria/standard set by the teacher or the educational system. Feedback and specifically, teachers' feedback can play a pivotal role in activating various cognitive mechanisms, such as information re-evaluation, which can ultimately predict how feedback will be perceived and processed. The several conceptual models presented above comprise the feedback

intervention theory of Kluger and DeNisi (1996). The first model (Figure 12) reflects the relation between feedback and task motivation showing that positive feedback can either motivate students to exert more effort in the task or lead to satisfaction and, hence, a reduction of effort. The second model (Figure 13) reflects the task-specific processes (Panadero & Lipnevich, 2022) that are triggered by feedback; that is, in the case of perceived failure, students will be more effortful and, thus, falling back to previously acquired learning strategies. Lastly, the third model (Figure 14) involves meta-processes that are concerned with the alignment of the feedback with the personal goals of the students, triggering emotional reactions and affecting the level of engagement and attention each student pays to the task (Panadero & Lipnevich, 2022). In short, the educational implications of this theory suggest that the structure and the delivery of the feedback to the students in a classroom environment are critical for students' achievement (Lipnevich & Panadero, 2021). If teachers' feedback is properly constructed, then it can optimise learning, otherwise it might divert attention and hinder students' academic achievement.

Given the above inconsistencies reported in the meta-analytic syntheses of empirical studies, it is important to disentangle what the potential influence of teachers' feedback is not only on students' academic achievement but also on students' motivation. It is important to consider the role of teachers' feedback in students' task-specific motivation since the feedback intervention theory suggests that students will typically process feedback at the task-level (Lipnevich & Panadero, 2021) and feedback is most effective at the task motivation level (Panadero & Lipnevich, 2022). Moreover, this line of research can provide a significant contribution to knowledge since it is not clear what would be the valence and the directional nature of the relations between teachers' feedback and students' achievement, motivation, and self-regulatory strategies in a low-performance educational context.

## **2.7. Parental expectations of academic achievement and self-regulated learning**

As I noted earlier in the social-cognitive conceptual framework of the thesis (see section 2.1), beyond teachers' influence on academic achievement and self-regulated learning, parents also have a role to play in promoting their children's achievement as well as motivational and metacognitive aspects of self-regulated learning (Pino-Pasternak &

Whitebread, 2010). This is a logical assumption since the development of children requires significant amount of parental in addition to community investment of material and psychosocial resources (Hofferth & Sandberg, 2001). In fact, early research has indicated that parental involvement with their children's schooling activities was crucial for students' success in school (Grolnick et al., 1997).

A self-determination theory perspective on parenting and schooling (Grolnick, 2009), suggest that parents enhance or undermine their children's motivation at school by fulfilling their basic psychological needs for autonomy (i.e., behaviours, cognitions, and emotions that are self-endorsed), competence (i.e., being effective and having a mastery orientation), and relatedness (i.e., building warmth and caring relationships). Parents can also affect their children's learning by implementing two instructional strategies, namely scaffolding and contingency (Pino-Pasternak et al., 2010; Pino-Pasternak & Whitebread, 2010). Scaffolding describes the action when parents become responsible for the aspects of the learning that lie beyond their children's ability and leave their children to engage with the aspects that fall within their level of competence (Pino-Pasternak & Whitebread, 2010). Contingency is a term used to capture the parenting instructional behaviour whereby a parent offers or withholds help based on the child's ability to master a learning task (Pino-Pasternak & Whitebread, 2010).

Although the work by Pino-Pasternak and colleagues drew upon the experiences of younger children, recent empirical evidence has also confirmed how critical parental support with academic matters is. For example, Choe (2020) showed that adolescents' reports of parental learning and emotional support were predictive of greater academic outcomes and parents' reports of support were found to be the strongest correlate of adolescents' academic achievement. In another study, adolescent-reported parental involvement in school and learning (e.g., watching the adolescents to do homework) were connected to adolescents' academic achievement indirectly through self-regulated learning (Thomas et al., 2019). In a rare qualitative study with adolescents, Thomas et al. (2021) reported that parental educational support played a critical role in adolescent students' self-regulated learning (behaviour, metacognition, and motivational aspects). According to the above, I can understand that parents can play a significant role in their adolescent children's learning by providing both emotional psychological and instructional assistance. However,

there is another more important aspect of parenting behaviours that has been strongly linked with both short-term and long-term academic attainment, namely parental expectations.

Children's parents tend to have some educational expectations for their children. Educational expectations have received attention in educational research since they are hypothesised to play a significant role in children's academic behaviours, capabilities, and motivational beliefs (Briley et al., 2014). Researchers utilise the term 'educational expectations' in different ways in the literature. There is one portion of researchers that use the term to indicate whether parents or children expect to persist and continue on a specific educational and occupational (degree-level) pathway (Briley et al., 2014; Lazarides et al., 2016). Additionally, there is another strand of research that uses the term more inclusively to include also short-term academic attainment in a specific school year or term (Mello, 2008; Pinguart & Ebeling, 2020). However, in the present study, I am interested in the short-term educational expectations of the parents and, thus, I demarcate from the first type of usage of this term by defining the long-term expectations as parental career/ educational aspirations (Goldenberg et al., 2001).

Parental educational expectations are considered a sub-component of parental involvement in their children's education (Benner et al., 2016; Jeynes, 2005, 2022). Parental attitudes and expectations about school and education in general fall under the 'personal involvement' component that describes the academic socialisation around the value and instrumentality of education (Hill & Tyson, 2009). As will be shown below, meta-analytic evidence has indicated that the impact of parental educational expectations on students' academic achievement appears to be consistently positive across a wide range of empirical study designs and contexts.

Several meta-analyses of quantitative empirical studies on parental expectations and academic achievement have appeared over the years. For example, Hill and Tyson (2009) conducted a meta-analysis of American quantitative studies and reported that average weighted correlation effect size was weak but positive ( $r=.18$ ). Another, more recent meta-analysis of 54 empirical studies based on urban student samples has indicated that the association between parental expectations and academic achievement was small to moderate with an effect size of .37 of a standard deviation (Jeynes, 2022). A larger meta-

analysis of empirical findings from 169 studies revealed that the meta-analytic pooled correlation between parental educational expectations and achievement was rather modest ( $r=.32$ ) (Pinguart & Ebeling, 2020). Given the above, I conclude that parental educational expectations could be significant determinants of students' academic achievement. Yet, the question remains whether the finding of a positive association would hold also for educational settings that are not classified as high performing, as defined by the PISA programme<sup>9</sup>.

Despite the above, it is not clear what are the mechanisms through which parental educational expectations are linked with academic achievement. The above meta-analyses estimated the direct correlation between expectations and achievement; however, those estimates do not tell us much about the mechanisms through which parental expectations can lead to improved academic achievement.

An early theoretical model was put forward in a comprehensive literature review by Seginer (1983). The model proposed by Seginer (1983) adopts the distinction between parental expectations and aspirations and describes an indirect process through which parental expectations influence academic achievement. Socio-demographic variables that are reflective of one's social, racial, and ethnic status were not included in the model since they were considered descriptive rather than process-oriented (Seginer, 1983). According to this model (Figure 15), parental expectations are conditional on three variables, namely school feedback on children's level of academic attainment, parents' own educational aspirations, and parents' knowledge as naïve psychologists and educators of their child (Seginer, 1983). Nevertheless, the model assumes that parental expectations are not directly related to academic achievement but rather indirectly through three mediators. These mediators are parents' supportive behaviours of their children's academic achievement (this could be scaffolding and contingency described above), differential reinforcement in terms of rewards (in case of expectancy compliance) or punishments (in case of expectancy deviation), and children's own educational aspirations (Seginer, 1983). This model could be a helpful heuristic that explains why the bivariate correlation between parental educational expectations and academic achievement was rather modest.

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<sup>9</sup> I use the findings from the Programme for International Student Assessment (PISA) to classify the educational systems as either high-performing or low-performing depending on whether they score below or above the OECD average in standardised and comparable academic achievement tests administered to adolescent students aged 15 years old that participated in the PISA programme.

Redacted for copyright purposes © Seginer (1983)

Figure 15. A model describing the pathways from parental educational expectations to academic achievement © Seginer (1983)

Alternative perspectives on the role of parental expectations in fostering academic achievement have also emerged; however, the common feature is that parental educational expectations are not directly linked with academic achievement. A large American study of 22,000 students reported that different aspects of parental involvement including parental educational expectations were predictive of students' self-regulated learning which, in turn, predicted academic achievement in reading but a direct effect was also present (Xu et al., 2010). This shows that in addition to Seginer's (1983) mediators, I could add students' motivation and metacognition as intervening variables that should be considered holistically. Another more cognitively oriented study in China, revealed that parental educational expectations were predictive of cognitive ability which, in turn, predicted academic achievement (Y. Li et al., 2019).

To sum up, the above evidence underscores the importance of parental educational expectations for students' academic achievement. However, there are some evidence gaps here that have not been (sufficiently) addressed by previous studies in this field. First, the majority of the existing studies on parental educational expectations and academic achievement are quantitative in nature, which does not offer in-depth information about how adolescent students process the role of parental educational expectations in fostering

their academic achievement. Secondly, it is not clear whether students understand their parents' short-term educational expectations and, finally, whether this understanding is related to their achievement. Given that the Study 3 is an attempt to understand the influence of other contextual factors beyond teachers' feedback and internal factors such as students' motivation and metacognitive self-regulation, I examined parental educational expectations only in Study 3 (Chapter 6). The reason for that is that although parental educational expectations are, of course, relevant for and have an impact on students' learning, they are factors that are activated outside of schools. In the next section, I discuss the role of peer influences on students' motivation and achievement.

## 2.8. Peer influences on academic achievement and self-regulated learning

Classmates are an important factor that has implications for adolescent development since some of the adaptive and maladaptive behaviours have been attributed to peers (Katsantonis et al., 2022). Classmates are, thus, considered here to be another important feature of learning in schools since they can be sources of motivation (through self-efficacy, self-concept) and can serve as an additional feedback source (Hattie & Clarke, 2018), as will be discussed below. Nevertheless, peers can also have a negative effect on learning since it is known that distraction by peers or observing peers' maladaptive learning behavioural habits are linked with academic procrastination (Svartdal, Dahl, et al., 2020). Hence, in the present study, I consider a specific aspect of the role of classmates in academic achievement; that is, I am interested in the social comparative processes, whereby students compare their achieved level of performance with that of their classmates. Additionally, I am also examining adolescent students' perceptions about the role of peers in their learning when assigned a writing task for homework. The reason for the writing task at home is that the role of peers in students' self-regulation and motivation can be clearly disentangled from the regulatory influence of teachers and the school boundaries. In the homework task, I am able to glimpse the impact of friends rather than classmates, who are not necessarily all friends with the interview participants.

Social comparison theory suggests that a social comparison process occurs when an individual is thinking about other people in relation to the self (Festinger, 1957). A social comparison process occurs because individuals wish to sustain an accurate self-concept and, thus, search for feedback about their traits and skills (Corcoran et al., 2011). According to Festinger (1957), when objective non-social standards benchmarks exist, people choose to evaluate themselves by comparing themselves with others. Social comparison approaches in the classroom have noted a link between the ability to compare with other students and increased academic achievement (Blanton et al., 1999; Huguet et al., 2001). Specifically, the Blanton et al. (1999) and the Huguet et al. (2001) studies found that students who were comparing their academic achievement with that of other students who were also good performers and believed to be better achieving than other classmates had greater academic achievement.

A comprehensive review of evidence on the social comparison processes occurring in classrooms has collated several years of information that I summarise in the Figure 16 and explain in greater detail. According to the review of Dijkstra and colleagues (Dijkstra et al., 2008), a social comparison is triggered by three types of motives, namely self-evaluation, self-enhancement, and self-improvement motives. These motives constitute fundamental needs that are strategic in nature (Corcoran et al., 2011). Self-evaluation motives in the social comparison process involve ability-related and opinion-related self-evaluations (Suls et al., 2002), which become more salient after the age of 7 or 8 (Dijkstra et al., 2008). Self-enhancement motives are used in the social comparison process to compare with dissimilar others to boost one's self-concept and protect the subjective well-being (Suls et al., 2002). Finally, self-improvement motives involve social comparison in order to improve one's performance (Dijkstra et al., 2008). The above distinctive social comparative motives have clear ties to the goal orientations that are described above in section 2.3.2. Self-improvement motives are by definition part of mastery goals (Sommet et al., 2021), whilst self-enhancement and self-evaluation are integral for performance goals (R. Butler, 1992).

The social-comparison process, however, needs a specific dimension to focus upon, which is usually achievement standards after having received feedback (Dijkstra et al., 2008). Individuals proceed then to compare either with an upward (i.e., better performing) or a downward (i.e., worse performing) target (Gerber et al., 2018). Downward comparisons

are made when self-esteem (an emotional aspect of self-concept- (Katsantonis et al., 2022)) is threatened to increase positive self-evaluations (Gerber et al., 2018). Selection of an upward comparison target is likely to boost self-evaluation when the comparison standards (in this case, achievement) are similar (Gerber et al., 2018). According to the recent conclusive meta-analysis by Gerber and colleagues (2018), most people display a strong tendency to compare upwards even if there is a perceived threat to self-esteem. The outcomes of the social comparison process can range from feelings of self-satisfaction, to increase in self-concept, to increased academic achievement (Dijkstra et al., 2008).

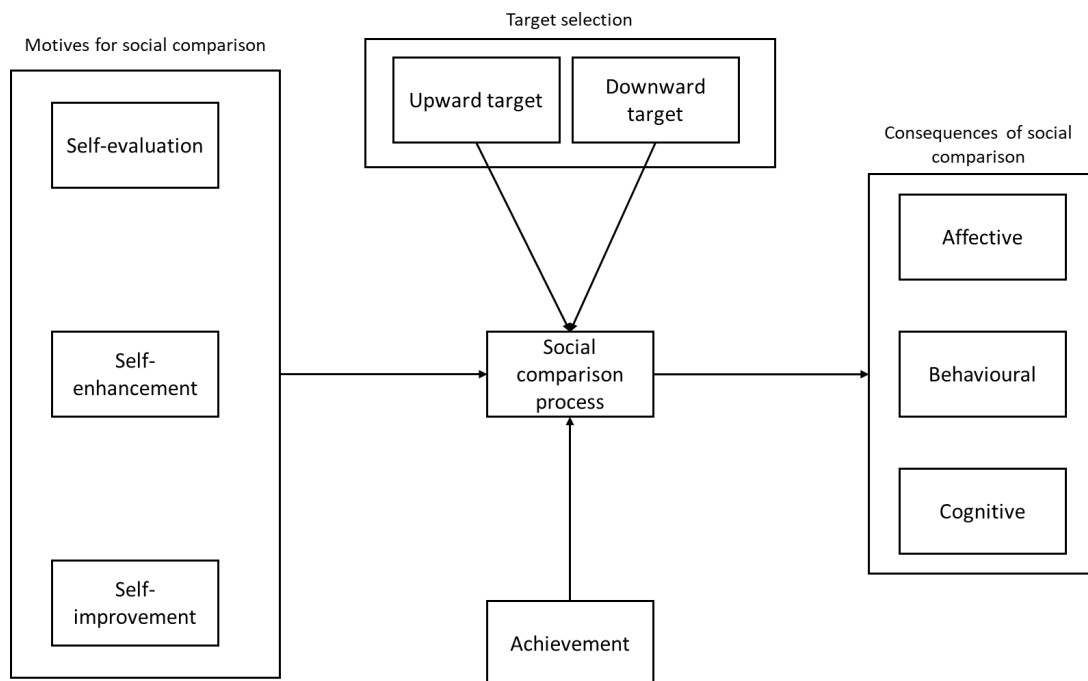


Figure 16. Antecedents and consequences of social comparisons in classroom settings © The Author

To sum up, the social comparative process in classrooms can prove to be beneficial for students' self-referent evaluations of their achievement. The above evidence indicates that being able to compare with other classmates, who are better achievers, could slightly improve students' achievement, too. Nevertheless, it is not clear whether adolescent students think about those comparisons and what those comparisons with classmates mean in terms of achievement. Additionally, it is interesting to explore whether adolescent students are aware of the reasons why some of their classmates are better achieving. The latter issue remains a matter that has not been examined, as far as I could ascertain. Finally, I

also explore the role of peer relationships in the regulation of effort invested in written homework, which has a motivational character (Winne & Hadwin, 2007).

Having discussed the key factors being studied to greater or lesser extent in this thesis, I am now turning to methodological issues revolving around the measurement of the key factors and the development of academic motivation and metacognition.

## **2.9. Operationalising self-regulated learning components: Aptitude versus event approaches**

When one is measuring self-regulated learning and/or its sub-component processes and factors, one is taking a specific view of the nature of self-regulated learning (Winne, 2010). The two views on the operationalisation of motivation and metacognitive strategies in self-regulated learning are called “aptitude” view and “event” view. The first view is that self-regulated learning and its sub-components (metacognition, motivation) are an aptitude. An aptitude is defined as an individual’s characteristic that can be measured and is assumed to precede and be essential for a successful intervention to occur (Snow, 1991). Aptitude theory suggests that some of the humans’ aptitudes can be trait-like or malleable to change (Snow, 1992). The aptitude view is not only limited to cognitive ability like IQ but can also encompass personality, motivational, beliefs, styles, and attitude psychological characteristics (Snow, 1991). In the aptitude perspective of self-regulated learning and its sub-processes, one would utilise momentary measures of metacognitive strategies and motivational beliefs through the use of self-report questionnaires/ scales, interviews, or teacher-reports (González-Torres & Torrano, 2008). The aptitude approach of self-regulated learning is considered essential to conducting research in the field of self-regulated learning (Winne, 2010).

Examples of multi-item measures of self-regulated learning as aptitude include the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich et al., 1991), the Learning and Strategies Study Inventory (LASSI) (Weinstein et al., 1987), Components of Self-Regulated Learning (CSRL) (Niemivirta, 1998), Patterns of Adaptive Learning Study (PALS) (Midgley et al., 1998, 2013), and the Children’s Perceived use of Self-Regulated Learning Inventory (CP-SRL) (Vandavelde et al., 2013) amongst other measures that have been and are being developed. The above-mentioned measures, though, are all quantitative in nature

aiming to elicit responses on a continuous scale. A qualitative measure of self-regulated learning is the Self-regulated Learning Interview Schedule (SRLIS) (Zimmerman & Pons, 1986). A teacher-report schedule has also been developed called Rating Student Self-Regulated Learning Outcomes: A Teacher Scale (Zimmerman & Martinez-Pons, 1988). It ought to be noted that all these measures include several sub-scales and each measure may include different operationalisations of self-regulated learning and its sub-component processes.

The second view of self-regulated learning measurement assumes that self-regulated learning is an event (Winne & Perry, 2000). The event view of self-regulated learning places emphasis on real-time self-regulatory actions of students during a learning task, which is called process-oriented measurement of self-regulated learning (González-Torres & Torrano, 2008). These self-regulated learning events can be distributed across three levels, occurrence, contingency, and patterned contingency, with each level adding more complexity to the self-regulated learning measurement (Winne, 2010). The self-regulated learning occurrence level involves measuring the number of times a self-regulated learning strategy is implemented by a student; however, a composite measure of occurrence of an self-regulated learning event is decontextualised and does not provide longitudinal information on preceding self-regulated learning events (Winne, 2010). The self-regulated learning contingency level of measurement takes place when a researcher (it could also be a computer) makes notes of two consequent applications of self-regulated learning strategies (Winne, 2010). Finally, the patterned contingency level involves repeated recording of a sequence of self-regulated learning strategies applied during a learning task (Winne, 2010).

The methods that assess self-regulated learning as an event are many and varied; however, some prominent methods include think-aloud protocols (Greene et al., 2018), micro-analytic methods (Callan & Cleary, 2019), and trace data (Perry & Winne, 2006), amongst other methods. All these methods capture students' self-regulated learning as a dynamic process that can evolve over time as students engage with a learning task (Y. Fan et al., 2022). Think-aloud protocols are online interviews where students report aloud on what they think they are thinking and doing while engaging with a task (Greene et al., 2018). Self-regulated learning micro-analytic assessment methods is an umbrella term used to capture a range of measurement types of students' cognitive, behavioural, and affective processes

while engaging with a task (Cleary et al., 2012; Cleary & Callan, 2018). Micro-analytic measures are highly targeted structured interviews aiming to capture responses to contextualised questions that reflect sub-component processes within aspects of the cyclical model of self-regulated learning (Cleary et al., 2012). Finally, trace data are unobtrusive method to gather data on students' self-regulated learning strategies arising from student-computer interactions, whereby students engaged with a learning software specifically designed to log students' behavioural reactions to the learning material(s) (Bernacki, 2018).

The proponents of self-regulated learning as an event view make a critique of the view of self-regulated learning as an aptitude since aptitude measures of self-regulated learning can be unreliable if one wishes to gain detailed information on very specific self-regulated learning strategies deployed by learners (Y. Fan et al., 2022; Rovers et al., 2019). In 2006, for example, Perry and Winne (2006) presented an educational software called 'gStudy' meant to log students' traces that were subsequently utilised to draw inferences about moment-to-moment changes in students' self-regulated learning strategies. In response to this article, several authors raised concerns regarding the validity of trace data especially with young children and in terms of whether the log analyser feature could accurately disentangle self-regulated learning behaviours from other behavioural reactions, amongst other counterarguments (Nenniger, 2006; Nolen, 2006). Regarding think-aloud protocols, some researchers do not consider them to be indicative of 'self-regulated learning as an event measures' since they capture information on students' self-regulated learning strategies as the students themselves perceive them and, thus, could be inaccurate (Winne, 2010). A similar claim could be easily made about self-regulated learning micro-analysis since the learners themselves report on their self-regulated learning strategies in a structured interview (Callan & Cleary, 2019; Cleary et al., 2012).

Reflecting on the strengths and limitations of the two views of self-regulated learning measurement and keeping in mind the main objectives of the present study, I reach the following conclusions which have implications for my own view of self-regulated learning and the measurement of its components. First, recent empirical research comparing the different ways of self-regulated learning measurement suggests that self-report measures can give accurate information regarding students' general degree of self-regulation (Rovers et al., 2019). Second, meta-analytic empirical research has illustrated that

self-report self-regulated learning measures (i.e., aptitude view) can provide accurate evidence on two facets of metacognition, namely metacognitive knowledge and metacognitive self-regulation (Craig et al., 2020). Third, self-report measures of students' self-regulated learning components have a legacy of being widely used method of assessing self-regulated learning (Winne & Perry, 2000) and are, thus, more established. Fourth, I take a similar stance to Greene et al. (2018) who suggest using the "right tool for each job" indicating that motivational components of self-regulated learning can be measured by self-report data. Finally, my research project has a strong educational effectiveness perspective and, therefore, larger than normal sample sizes of adolescent students in classrooms are needed in line with educational effectiveness research (D. Reynolds et al., 2014). Empirical studies adopting the self-regulated learning as an event view typically have small sample sizes (Callan et al., 2021; Y. Fan et al., 2022), making, thus, this design inappropriate for self-regulated learning measurement within traditional learning environments in Greek schools.

Having discussed the aptitude versus state perspective of self-regulated learning and its components, I now turn to another significant evidence gap regarding the motivation and metacognitive skills of adolescent students, which refers to the lack of qualitative interview-based studies.

## **2.10. Lack of qualitative approaches to adolescents' learning and achievement**

Despite the existence of significant quantitative studies on students' motivation and self-regulation (Callan & Cleary, 2019; Cleary & Kitsantas, 2017; Karakolidis et al., 2016, 2019; Katsantonis, 2020; Pitsia et al., 2017), there are few qualitative studies that provide detailed insights into adolescent students' feelings, thoughts, and perceptions of motivating factors and self-regulation (Perry et al., 2002). An additional important gap in existing literature is the absence of holistic qualitative studies exploring students' voices regarding the links between the contextual factors of teacher's feedback, peers, and parental expectations and students' motivation and self-regulation. Qualitative studies on students' motivation, self-regulation, and contextual factors can provide rich insights into the processes and factors underpinning academic achievement. Therefore, I examine the above-mentioned contextual factors in relation to motivation and self-regulation through

adolescent students' perceptions and perspectives. The advantage of qualitative semi-structured interviews in comparison to self-report questionnaires is that they allow students to have agency to express their inner thoughts, experiences, and emotions (Gubrium & Holstein, 2012). This practically means that students taking part in the qualitative interview-based study have the freedom to express themselves without being constrained by the requirements of a questionnaire with fixed questions and response options.

Following directly from the issues around qualitative interview-based investigations of the components of self-regulated learning, I discuss in the section below some key developmental facts about two critical aspects of self-regulated learning, namely motivation and metacognition. By considering evidence on the developmental trajectories of the constructs of students' motivation and metacognition, I justify why it is important to study these aspects of self-regulated learning during adolescence.

### **2.11. Developmental considerations: How metacognition and motivation develop**

In general, there is a need to gain greater insight into motivation and metacognitive self-regulation strategies during adolescence as will be shown below. There is a preponderance of studies of self-regulation strategies and motivation (e.g., Barnard-Brak et al., 2010; Bråten & Olaussen, 2005; Broadbent & Fuller-Tyszkiewicz, 2018; Dörrenbächer & Perels, 2016; Hong et al., 2020; Luo et al., 2023; Nelson et al., 2015; Theobald, 2021) that draw inferences from young adult university/college samples. However, it is argued that it is more appropriate to conduct such studies with secondary school students because of the following developmental reasons.

Early research in the 1980s and 1990s suggested that elementary school children face difficulties in applying cognitive and metacognitive strategies (Dignath & Büttner, 2008). This occurs because metacognitive abilities develop throughout the school years and some growth still occurs even in adolescence and adulthood (Schneider, 2010). More recent studies, though, suggest that metacognitive knowledge and skills start developing as early as the pre-school years at a very rudimentary level and become more refined as the academic demands increase (Veenman et al., 2006). Although children from a very early age display

evidence of metacognitive skills, metacognitive knowledge of certain learning strategies develops at a later stage of human development (Karlen et al., 2014). A fairly recent developmental study illustrated that most significant growth in metacognitive abilities occurs in adolescence and that metacognitive abilities plateau and stabilise in adulthood (Weil et al., 2013). Therefore, it was considered not appropriate to conduct the current project with very young children studying in elementary/primary schools that typically cannot report accurately on their metacognitive self-regulatory strategies and metacognitive knowledge of task-specific strategies.

A caution is warranted, though, since many studies examined the development of different features of metacognition decontextualised from the school classroom (Bardach et al., 2023). According to a recent robust longitudinal study in a school setting (Bardach et al., 2023), students' self-regulated learning and external regulation, which were measured in actual classrooms, were found to be declining over time. Similarly, Wang and Eccles (2012) and Ahmed et al. (2013) also reported a decline in self-regulated learning strategy component in adolescent students within school settings. This raises the question if metacognitive self-regulatory strategies are important for students' academic achievement in latter stages of education. Hence, it is necessary to sample adolescent students from multiple classrooms and grades to reach some valid conclusions regarding when exactly in adolescence is a greater educational focus on self-regulatory strategies more important.

In the study of individual differences in motivated metacognitive self-regulation, I also have to consider how academic motivation develops. Beliefs about ability and effort develop between 5 and 12 years and adolescents are able to clearly distinguish between ability and effort and comprehend the meaning of ability as capacity (Folmer et al., 2008; Nicholls, 1978). The findings on the growth of academic self-competence beliefs paint a grim picture since evidence indicates that students become less confident in their competence as they transition to secondary school (Wigfield et al., 2015). Similarly, students' valuing of certain academic subjects declines as age increases (Fredricks & Eccles, 2002). Evidence has also shown that intrinsic motivation declines in adolescence during high school (Gottfried et al., 2001, 2007).

Informed by the reviewed developmental evidence, it becomes clear that studies of motivation and metacognitive self-regulation with a focus on higher education students may

not be very helpful if I wish to achieve early educational gains in these areas. It is argued that it is more reasonable and developmentally sensitive to explore the interactive effects between students' motivational and metacognitive characteristics during early to middle adolescence, when metacognitive skills are still malleable to change and marked declines in students' academic motivation occur. By exploring these (potentially) interactive patterns in adolescence, researchers can gain greater insights into how these important aspects of self-regulated learning function synergistically in a sensitive period for development. Particularly, the study of the possible interactive patterns between motivation and metacognitive self-regulation can highlight potential areas for targeted intervention. Additionally, this approach can contribute to theory on self-regulated learning by illustrating whether motivation can compensate for a possible failure in metacognitive self-regulation or whether metacognitive self-regulation can potentially make up for students' low motivation.

## **2.12. The current thesis: Synthesising the literature**

In light of the above literature in Chapter 2, the present thesis aims to explore a complex system of influences on the academic achievement of Greek adolescent students by focusing on a broad spectrum of both student-level factors, such as motivational beliefs and metacognitive self-regulation strategies, and contextual factors, such as teachers' feedback, parental educational expectations and peer influences. Hence, the overarching research question is:

What student-level and contextual factors are critical for academic achievement among adolescent students in Greece, and in what ways do these factors contribute to their success?

This research question will address a significant educational problem in Greek secondary education by contributing to existing knowledge on the pathways to improving adolescent students' academic achievement in Greece, which is known to be steeply declining (see Chapter 1). This overarching research question is further divided into several study-specific research questions as shown in Table 3 below. In terms of the contribution to

extant knowledge, the current thesis aims to address several key issues, which constitute evidence and knowledge gaps.

One outstanding issue in the literature that the present study contributes to is the complex interrelations between the various motivational beliefs and, subsequently, academic achievement. In the literature review above (see section 2.3.4), I showed that there is an absence of comprehensive models describing the interplay between different motivational beliefs in adolescence. Therefore, given the inconclusive evidence, more research is needed to understand the dynamic interplay between the different motivational beliefs and specifically, the predictive effects that define these relations. Hence, the first research question of Study 1 (Chapter 4) specifically addresses this issue.

Additionally, the present thesis aims to address the nature of the higher-order interactions between different motivational beliefs and metacognitive self-regulation strategies in relation to academic achievement (see section 2.4). As already noted in section 2.11., some evidence suggests that metacognitive self-regulation and metacognitive knowledge become more refined in adolescence, yet academic motivation is known to decline. This raises the question of whether there are any negative interactions between these important components of self-regulated learning models (see section 2.2.) in adolescence and how these might be differentially linked with academic achievement. To address this evidence gap, the first research question (RQ1) in Study 2 (Chapter 5) was formulated.

Another research issue that the thesis covers concerns the role of several contextual factors in promoting academic achievement (see section 2.1). Therefore, the role of the contextual factor of teachers' feedback is examined first since there is inconclusive evidence regarding the role of teachers' feedback in promoting students' academic achievement and motivation (see section 2.6.). Further, the role of parental educational expectations and peer influences are also examined to gain greater insights into these factors' influence on academic achievement. To address these evidence gaps, the second research question (RQ2) of Study 1 (Chapter 4) and the first research question (RQ1) of Study 3 (Chapter 6) were formulated.

Moreover, given the limited scope and scarcity of past qualitative research on the factors associated with adolescent students' academic achievement, the current thesis aims

to explore what are students' perceptions about the contextual and student-level factors that contribute to their achievement (see section 2.10.). To achieve this aim, semi-structured interviews were designed to give students the flexibility expand upon their thoughts, feelings, and perceptions unhindered by the constraints of a fixed questionnaire scale. To this end, the first research question of Study 3 (Chapter 6) was designed.

In short, the above considerations lead to specific research questions that narrow down the focus from the overarching research objective. These research questions are presented comprehensively in Table 3 below. Taken together three studies were conceptualised, designed, and conducted to address these questions, which can all contribute to extant knowledge regarding which factors are more important for Greek adolescent students' academic achievement. These studies combine both qualitative and quantitative methodologies and involve both primary data collection in schools and secondary data analyses of existing nationally representative data.

Since the theoretical framework of the project has been presented above, I will outline in Chapter 3 below the epistemological and methodological considerations that guide the present thesis.

Table 3. Outline of the three empirical studies, data collection, methods, and research objectives

Study	Research questions	Data collection	Method	Research objective(s)
1	RQ1: How are self-efficacy, performance-approach goals, intrinsic and extrinsic/instrumental motivational beliefs related? RQ2: How are teachers' feedback, students' motivational beliefs, and science achievement associated?	Secondary data analysis	Quantitative: (variable-centred) Correlational, multilevel structural equation modelling, mediation analysis	This study will show what pathways from teachers' feedback to motivational beliefs are more important for Greek adolescent students' academic achievement
2	RQ1: How do motivational and metacognitive characteristics co-occur in the same students? How are the interactions between motivational and metacognitive characteristics formed? RQ2: How do different profiles of common motivational and metacognitive characteristics influence school language achievement?	Primary data collection	Quantitative: (person-centred) Correlational, latent profile analysis, BCH method	This study will explain the different configurations of students' motivational beliefs and metacognitive self-regulation strategies, the nature of the relation between the higher-order interactive effects between motivation and metacognitive self-regulation strategies with academic achievement, controlling for standard demographic covariates
3	RQ1: What are the students' perceptions about	Primary data	Qualitative: Semi-	This study will delve into adolescent

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the common contextual teacher-related, parental, and peer-related factors underlying students' school language achievement?

RQ2: What are the plausible relationships between the emerging factors influencing school language achievement?

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collection

structured interviews,  
abductive thematic  
network analysis

students' perceptions of the different contextual (i.e., peers, parental expectations, teachers), motivational, and self-regulatory factors.

## Chapter 3. Methodology

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In this methodology chapter, I begin by outlining the interpretative framework within which the current thesis operates. Next, I provide a concise overview of the methodological choices and decisions made in the current thesis concerning the selection of methods for each empirical study. Analytical approaches are justified and ethical considerations concerning the research are discussed in light of the existing guidelines of the British Educational Research Association and the British Psychological Society. I also explain procedural issues revolving around obtaining permission to approach and conduct research in Greek secondary schools. Detailed methodologies are presented in each study, in Chapters 4, 5, and 6.

### 3.1. Interpretative framework of the thesis

In this section, I endeavour to explain the philosophical assumptions that underpin the research design of the current thesis. To this end, I follow Creswell and Poth (2018) to describe the paradigm interpretative framework of the thesis. I explain why the selected paradigm is appropriate for the present thesis by showing how the different parts of the research process fit within the principles of the chosen philosophical assumptions underlying the selected paradigm.

The term ‘paradigm’ refers to a collection of beliefs that guide researchers’ research actions (Denzin & Lincoln, 2018). Paradigms capture researchers’ worldviews about the nature of the world, humans’ place in it, and the breadth of potential associations between that world and the several of its components (Guba & Lincoln, 1994). Admittedly, there are various epistemological paradigms, such as post-positivism, constructivism, or critical theory, amongst others (Guba & Lincoln, 2005). However, the paradigm that underpins the current thesis is pragmatism and below, I provide the reasons why pragmatism is the appropriate worldview for my research project.

Given the overarching research question (see **section 2.12.**), the appropriate epistemological paradigm for this study is pragmatism. The philosophical foundations of the pragmatic paradigm have their roots mainly in the works by John Dewey, but also in those by Peirce, James, Herbert Mead, and Rorty, among others (Mertens, 2019). According to Biesta (2010), the Deweyan pragmatic paradigm suggests that knowledge is generated

through researchers' actions and their consequences and is not an independent objective "out there". In essence, pragmatic oriented studies are conducted for their empirical and practical implications (Johnson & Onwuegbuzie, 2004). This pragmatic viewpoint lies at the centre of this project since in the present thesis I am not solely concerned about the theoretical "gaps" in the literature. Instead, I seek to identify potential self-regulated learning and contextual factors that saliently correlate with students' academic achievement, which can be considered in future interventions aiming to improve Greek students' academic achievement. Additionally, I am not only interested in identifying which factors are more important but also how and why are these factors connected with academic achievement.

Drawing upon Morgan (2007), the three key views of pragmatism are summarised as follows and connected with the aims of the project. First of all, pragmatic research is neither theory- or data-driven, but embraces both types of inquiry (Morgan, 2007). That is, it moves from data to theory and again, from theory to data. For instance, the structure of study 3 (**Chapter 6**) echoes this assumption because it is both theory- and data-driven. In other words, I begin by formulating some deductive codes based on preceding theoretical evidence, but I also embrace the inductive approach to identify patterns in the qualitative data. Similarly, in Study 1 (**Chapter 4**), several structural equation models are specified and tested; however, models may not be a good approximation of the data-generating process and thus, they are revised following the suggestions of statistical indices. Similarly, in Study 2 (**Chapter 5**) the selection of the best fitting model is based on the data.

Secondly, pragmatic research accepts both the existence of an objective reality and individuals' interpretation of the reality (Morgan, 2007). In spirit of this principle, I argue that the learning principles implied by the construct of self-regulated learning exist as measurable "objects", but individual students can have different perceptions and experiences thereof. This means that single measures of motivation and metacognitive self-regulation will be administered to all participants in Study 2 (**Chapter 5**). Nevertheless, I recognise that each participant will score differently since each individual will have a unique perception of these psychological constructs and contextual factors (**Chapter 6**).

The final principle of pragmatic research posits that it is not necessary for research findings to be either context-specific or generalisable, rather researchers have to test

empirically whether the findings are transferable (Morgan, 2007). This principle ties closely with the my approach to sampling from multiple schools and different regions. This strategy will ascertain that the findings will not reflect idiosyncrasies of specific students in a specific school but will be more representative of the opinions and attitudes of multiple students and schools, as much as possible.

From a methodological viewpoint, pragmatism offers researchers great autonomy in the selection of research methods, tools, and procedures (Creswell, 2007). Thus, given the greater flexibility compared to other paradigms, such as postpositivism or interpretivism/constructivism, pragmatic epistemology is suitable for mixed methods studies that juxtapose quantitative and qualitative perspectives (Johnson & Onwuegbuzie, 2004), such as in this project.

As noted earlier in **section 2.12.**, Study 1 is a quantitative study based on secondary data analysis, Study 2 comprises a quantitative study based on primary data collection in Greek secondary schools, and lastly, Study 3 is a qualitative interview study based on primary data collection with Greek adolescent secondary school students. In that sense, the current thesis could be considered a mixed methods study (Hitchcock & Onwuegbuzie, 2022; Johnson & Onwuegbuzie, 2004; Tashakkori & Creswell, 2007). However, the mixed methods research design is not meant to serve as a means for triangulating the findings, rather this design is used in an attempt to integrate the quantitative results with the findings of the qualitative study and to construct a shared account of what the results and findings mean to each other (Collins, 2022). In the current thesis, direct triangulation would have been impossible since each study contributes new insights into the overarching issue of identifying pathways to improved academic achievement by including overlapping but also distinct elements.

Mixed methods research, also called mixed research, has several advantages. Mixed methods research rejects the so-called *incompatibility thesis*, which advocates that either quantitative or qualitative paradigms and their associated research methods should not be mixed (Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 2012). This permits the researcher to gain a full picture and a more in depth understanding and description of the phenomenon (Yardley & Bishop, 2008). In the current thesis, the combination of

quantitative and qualitative methods can provide a richer understanding of the factors that are important for adolescent students' academic achievement. The quantitative strand of the thesis provides the much needed internal validity to the research process (Yardley & Bishop, 2008), whereas the qualitative strand comes to compliment the quantitative with its external validity by situating the constructs within the everyday experiences of the students.

Admittedly, despite the mixed methods nature of the thesis, the research design follows the format of what scholars (Tashakkori & Creswell, 2007; Teddlie & Tashakkori, 2009) call *parallel mixed designs*. A parallel mixed research design involve a research project where the different quantitative and qualitative phases take place in a non-sequential parallel way either at the same time or with a small time lapse (Teddlie & Tashakkori, 2009). In that sense, Study 1 was conducted chronologically before Study 2 and Study 2 was conducted before Study 3. However, all studies were designed in the first year of the doctoral programme and, thus, are not sequential.

Given that Study 1 comes first, I outline the methodological overview of Study 1 in **section 3.2.**, followed by the methodological overview of Study 2 in **section 3.3.**, and the methodological overview of Study 3 in **section 3.4.**

### 3.2. Methodological synopsis of Study 1

The research questions that Study 1 aims to address are mentioned in **section 2.12.** Two key points need to be recapped. First, Study 1 aims to examine the interplay between academic motivational beliefs, perceived teachers' feedback, and academic achievement at the student level. Second, the study aims to explore the impact of the school-level on these processes. Based on these research questions, Study 1 is grounded in a secondary data analysis of existing population-based representative data of Greek adolescents, who participated in the Programme for International Student Assessment survey in 2015 (OECD, 2016a).

The secondary data analysis technique seeks to address new research questions by analysing readily available data that were collected for a different purpose (E. Smith, 2008). Secondary data analysis is commonly used in social sciences and has many advantages, such as nationally representative samples, a large number of variables, and standardised items

and indices across different populations (Kiecolt & Nathan, 1985). Another significant advantage of secondary data analysis is that it permits the researcher to conduct advanced statistical analyses that require large sample sizes at both the individual and the cluster level (Vartanian, 2011). Specific to Study 1, the clustered sampling at the school level permits the examination of the complex interplay between the various motivational beliefs and teachers' feedback both at the student and the school level.

The participants of Study 1 are adolescent students aged 15 years old studying in secondary schools in Greece who participated in the *Programme for International Student Assessment* in 2015 (PISA- OECD, 2016a). The PISA 2015 programme is a standardised international survey run in 72 countries that measures: (a) students' achievement in science (primary focus), reading, and mathematics; (b) students' psychosocial adjustment; (c) aspects of classroom contexts and families' backgrounds (OECD, 2016a). The PISA datasets are publicly available for secondary analyses through the internet. In short, the Greek PISA samples amount to 5,532 adolescent students. Although the PISA 2015 focus is on science achievement and science-related motivational beliefs and perceptions, it was selected for the following reasons. Science is an achievement area that is constantly declining in Greece (see Chapter 1). Most importantly, though, the PISA 2015 data set includes many important motivational variables that are not available in later or earlier rounds of the PISA survey. PISA is also a representative data set of the entire Greek population of adolescent students and, thus, any conclusions drawn from those analyses are more 'valid' of the processes that take place in the wider population of that time.

PISA has administered a standardised science achievement test to all students along with an accompanying questionnaire. All measures administered in the context of the PISA 2015 testing were validated through the use of Item Response Theory modelling (IRT) (OECD, 2016a). Therefore, I could be certain of the internal structure validity and the reliability of the measures. All item wordings for the scales that are of interest are available in Appendix C and sample item wordings are presented in Study 1 (**Chapter 4**).

In Study 1, I analysed the PISA data using a combination of quantitative statistical methods called *structural equation modelling* and *multilevel modelling*. In Study 1, I combine structural equation models with multilevel models to estimate the interplay between the

different motivational beliefs and teachers' feedback and academic achievement, both at the student and the school levels. Hence, I provide a brief explanation of these statistical analyses in the following paragraphs since these methods are well-known in educational psychological research.

Structural equation modelling is an umbrella term that refers to a family of multivariate models that deal with specifying and testing systems of regression equations between one or several dependent (endogenous) and independent (exogenous) variables (Hair et al., 2019; Kline, 2023; Tabachnick & Fidell, 2012). Structural equation modelling can accommodate both objectively measurable variables (e.g., income, age, etc.), but it can also include unobserved latent variables, such as self-efficacy (Hoyle, 2022). The unobserved latent variable modelling as part of structural equation modelling is particularly relevant in educational psychological research since many, if not all, constructs are assumed to be abstract and researchers can only infer their existence through the scores on several items (Katsantonis, 2021; McDonald, 1999). One advantage of structural equation models is that they can simultaneously test statistical associations between multiple variables at the same, which can serve to build and test theory- and/or data-drive hypotheses (Kline, 2023). The major advantage of structural equation modelling is that it can attenuate the effects of measurement error that is inherent in all psychological and educational multi-item measures (Bollen, 1989; Katsantonis, 2022). Therefore, this modelling approach can provide more accurate parameter estimates compared to classical regression approaches.

Multilevel modelling, also known as hierarchical linear modelling or mixed-effects modelling, is employed when the data are cluster sampled from different levels (Goldstein, 2010; Raudenbush & Bryk, 2001). A classic example of a multilevel data structure is students nested in classrooms nested in schools (Tabachnick & Fidell, 2012). Multilevel models can allow the researcher to disentangle the variance attributed to between-student and between-school differences, as well as to test complex regression models at multiple levels of the hierarchy of the data (Hox et al., 2017). One advantage of multilevel models is that they appropriately separate individual-level variance from classroom- or school-level variance and can, thus, result in more accurate parameter estimates (Heck & Thomas, 2020; Silva et al., 2019). Another advantage stemming from the use of multilevel models is that

researchers can examine how macro-level processes and phenomena interact with each other and influence individual-level processes and outcomes (Heck & Thomas, 2020).

From the above description, it is clear that combining the structural equation modelling approach with the multilevel modelling would result in more accurate and trustworthy results. Hence, this explains why I utilise these methods in Study 1, which can be found in **Chapter 4**.

### 3.3. Methodological synopsis of Study 2

Having described the key methodological consideration of Study 1, I now proceed to provide a methodological overview of Study 2. The second study of this thesis shifts the perspective from variable-centred to person-centred (for a discussion see **section 2.4.**). I reiterate here the key objectives of Study 2. First, Study 2 aims to explore the higher-order interactions between motivational beliefs and metacognitive self-regulation in a Greek adolescent sample. Second, the study aims to explore the links of the different interactive patterns with academic achievement. Lastly, the predictive effects of several demographic characteristics were also examined to identify the role of the students' background in the configuration of the interactions and achievement.

To empirically test the above objectives, a primary data collection was conducted in Greek secondary schools because there were not available data sets that contained all the desired variables for a secondary data analysis. The method adopted to elicit responses from the participants was the survey. Surveys are one of the most frequently utilised methods of data collection, which aim to elicit information from and about individuals in order to contrast, describe, categorise, interpret, analyse, and associate different attitudinal, cognitive, and/or behavioural phenomena (L. Cohen et al., 2018; P. P. Phillips et al., 2013). The survey design is characterised as cross-sectional face-to-face (Gideon, 2012) administered in schools. In total, 1046 adolescent students from 19 schools from urban, semi-urban, and rural areas agreed to participate in the survey. The sampling procedure can only be characterised as a convenience sampling because the students and schools were not selected using a probability-based algorithm or using the simple random sampling technique

(Vehovar et al., 2016). Hence, the results of any analyses based on this sample cannot be generalised to the whole population of Greek adolescents studying in secondary schools.

Regarding the measurement of the key constructs, the data collection instrument consisted of a questionnaire. The questionnaire comprised five standardised multi-item scales from Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich et al., 1991; Pintrich & Groot, 1990), accompanied by a couple of demographic questions and students' achievement indexed by their most recent language class grade. The MSLQ measure has been administered in the past in even younger primary school students in Greece and is considered a valid measure in this context (Metallidou & Vlachou, 2007, 2010).

In light of the person-centred objectives of Study 2, the data were analysed using latent profile analysis. Latent profile analysis is part of the finite mixture modelling family of statistical models (Masyn, 2013). Although in the case of structural equation models researchers deal with continuous latent variables that assume that all individuals in the sample come from a single population, in latent profile analysis analysts have a single latent categorical variable that clusters the sample into distinct subgroups based on their scores (Clark et al., 2013; Lubke & Muthén, 2005), hence the term “population heterogeneity” (see **section 2.4.**). The different clusters of individuals could be characterised by quantitative (e.g., low, medium, high) or qualitative (e.g., qualitative differences in motivation and self-regulation strategies) differences (Lubke & Muthén, 2005).

The major advantage of latent profile analysis in comparison to other clustering approaches, such as k-means or hierarchical cluster analysis, is that it is a probabilistic technique of clustering that offers several fit indices to assist the researcher in selecting the best fitting model (J. Bauer, 2022; Nylund-Gibson & Choi, 2018). Another important advantage of the latent profile analysis approach is that it can reveal interactions between multiple variables that naturally occur in the data (D. Bauer & Shanahan, 2007; Lanza et al., 2010; Merz & Roesch, 2011). To model such a higher-order interaction between the various motivational beliefs and metacognitive self-regulation through the conventional regression approach would present severe interpretative and computational challenges (Thommen et al., 2021). Hence, the latent profile analysis could answer important theoretical questions about the nature of the interactive patterns between metacognitive self-regulation

strategies and motivational beliefs in adolescents and how these patterns are linked with academic achievement. Study 2 can be located in **Chapter 5**.

### 3.4. Methodological synopsis of Study 3

Having approached the overarching research question (see **section 2.12.** and **Chapter 1**) through both variable-centred and person-centred approaches, a major limitation is the scarcity of qualitative studies on adolescent students' academic achievement in school settings. Hence, Study 3 aims to address a limitation of past empirical research by exploring adolescent students' perceptions of the motivational, self-regulatory, and contextual factors that are related to their academic achievement. The study, though, goes beyond simple identification but also attempts to identify patterns of relations between the emergent themes.

As became apparent in previous sections, Study 3 is an interview-based study. The participants are students aged ~14/15 years old studying in secondary schools in Greece. In total, 16 students (mostly girls) volunteered to participate in this qualitative study. These students came from schools that had agreed to participate in the quantitative Study 2. This sample size is justified for a thematic analysis interview-based qualitative study since approximately 12 interviews are sufficient to reach saturation of thematic analysis codes according to methodological studies of saturation (Ando et al., 2014; Constantinou et al., 2017; Guest et al., 2006; Hennink et al., 2017).

In principle, interviews are utilised for various purposes, such as assessing a person, event, circumstances, creating tests or hypotheses, and sampling participants' opinions (Cohen et al., 2018). Interviews are an effective and valid method to understand others' perceptions (Maxwell, 2012). In semi-structured interviews, the topics and question prompts are predefined and open-ended. However, the sequence and wording of the questions may be adapted to the needs of each interviewee in contrast to structured interviews where the interview protocol is strictly followed (Grix, 2019). Thus, I consider semi-structured interviews on students' academic achievement as an appropriate method of data collection.

The interview protocol is divided into three sections as follows. The first section aims to cover students' perceptions of the contextual factors (e.g., feedback, support, parental achievement expectations, peer influences). The second part is devoted to students' motivational beliefs (e.g., self-efficacy, intrinsic and extrinsic motivation) and self-regulatory strategy use whilst undertaking an imaginary task of writing an abstract. The final part of the interview protocol aims to collate some information on students' background, such as grades, and best and weakest subjects. A summary of the broad interview topics is presented in Figure 17 below. The whole interview protocol is presented in Appendix E.

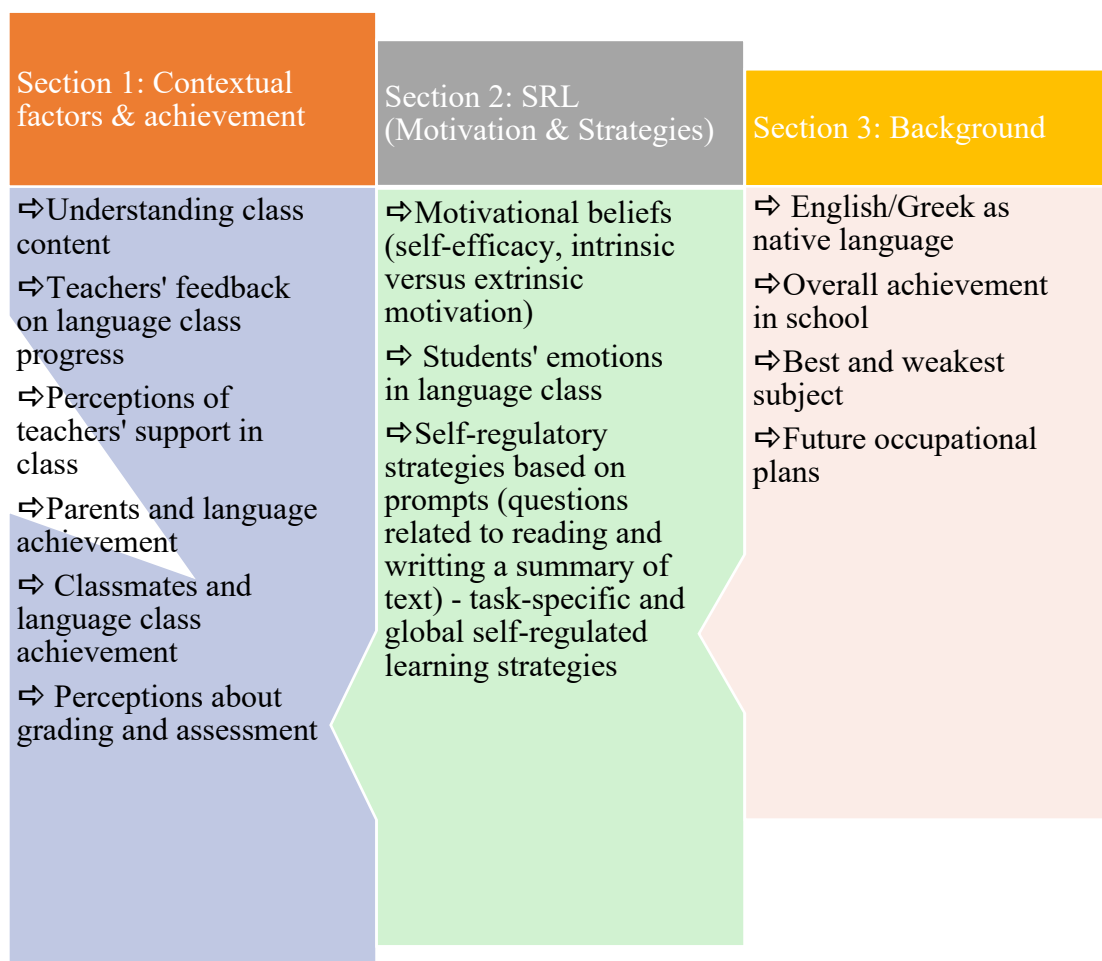


Figure 17. Summary of interview topics © The Author

Participants for the qualitative study were recruited from schools on a voluntary basis. If more students expressed an interest to participate in the study, then they were welcomed to participate in a group discussion that did not necessarily contribute to this study. One-to-one semi-structured interviews were carried out. Each interview had three phases in line with the methodological literature (Gillham, 2005). In the first phase, called the “entry phase”, interviewees were welcomed, thanked for their interest in participating, and informed about the purpose of the study and the structure of the interview. The second, substantive phase involved asking the questions, probing further, and projecting patience and understanding. Finally, during the closing phase, I asked the interviewees if they wished to add something or ask any queries they had, and in the end, I thanked them for their time. I estimated that each interview lasted between 15 to 20 minutes.

The interviews took place in a quiet space in the schools. The interview questions were asked in the predetermined order with fixed wordings. However, depending on the flow of the responses, some minor changes to the order and wording of the questions were needed. If students asked for clarifications, those were provided making sure that I did not lead the students towards a specific response. During the interviewing process, the following principles were adopted in line with methodological recommendations (Seidman, 2006). My role as an interviewer was to simply listen more to what interviewees have to say without interrupting and speak less. In case I did not understand something during the interview or clarifications were needed, I followed up on what the interviewee was saying. Sample follow up questions were “can you tell me *more* what you mean by that?”, “I am not sure I have quite got that” (Gillham, 2005; Seidman, 2006).

The interview data were manually transcribed in Microsoft Word and were imported into Atlas.ti computer software to implement a computer-assisted qualitative data analysis (Friese, 2019). Given the pragmatic interpretative framework of the thesis, I conducted an innovative abductive thematic network analysis following the methodological steps outlined in the literature (Attride-Stirling, 2001; Goldbart & Marshall, 2014; Rambaree, 2018). The abductive approach to the thematic analysis (for an overview of thematic analysis see V. Braun & Clarke, 2006, 2022) is aligned with the pragmatic approach since it is neither hypothetico-deductive nor inductive, rather it blends both approaches to shed new insights informed by both theory and the data (Thompson, 2022). The steps in an abductive

thematic analysis are the following: (a) creating codes; (b) reducing codes to themes; (c) constructing thematic network by clustering sub-themes into 'organising themes', and clustering organising themes into 'global themes'; (c) provide a description and exploratory theoretical analysis of the constructed network (Attride-Stirling, 2001). Study 3 can be found in **Chapter 6**.

### 3.5. Ethical considerations

In this section, I describe the ethical considerations of the present research project. To start with, I outline the ethics approval and risk assessment details. Next, I explain how the project's procedures are aligned with professional bodies' ethical guidelines for conducting research.

The empirical studies have received ethical clearance from the Psychology & Education Research Ethics Committee at the Faculty of Education, University of Cambridge, UK on 29/7/2022. A separate risk assessment was also conducted and approved by the Faculty of Education, University of Cambridge, which assured that the procedures of the research are completely safe for both the researcher and the participants. The risk assessment was completed on 18/7/2022.

In addition to the above, the present thesis' research design adheres to the ethical standards and guidelines for conducting human research as set out by the British Psychological Society (Oates et al., 2021) and the British Educational Research Association (BERA, 2018).

Specifically, the purposes of this research undertaking were transparent to participants and their parents/carers. Written and verbal informed consent were solicited from the participants' parents/ carers and students, respectively. Young people who were unable to give verbal consent were not included in this study. All participants had the right to withdraw from the research at any time and without the need for prior announcement of their intent to do so.

There was no probability of physical or psychological harm arising from participation since sensitive personal or confidential data were not collected, sensitive topics did not come up, and invasive interventions were not conducted (risk assessment- Oates et al., 2021). Finally, the privacy of the participants was assured because the collected survey and

interview data will be kept confidential, anonymous, and secure behind a password-protected PC in line with the UK Data Protection Act (2018) and the EU's General Data Protection Regulation (BERA, 2018). That is, the questionnaires and interviews did not require any personally identifying information. The data will not become available through any online repositories because of the restrictions imposed to the research by the Greek Ministry of Education (see **Appendix B**). Consent forms and information sheets for parents/carers are available in **Appendix A**. All students assented to participate in the research after I had personally explained the purposes of the research to them. If a student's parents/ carers had provided consent but the student did not wish to complete the survey or participate in the interview study, then the student was allowed to withdraw from the research.

### 3.6. Procedure

In this section, I describe first the procedure of getting access to the PISA data. Afterwards, I will outline the steps for obtaining permission to conduct the research in Greek secondary schools and how students were recruited to participate in the study.

As mentioned in **section 3.2.**, Study 1 is a secondary data analysis of PISA data. PISA data are publicly available via the internet from the Organisation for Economic Co-operation and Development's (OECD) dedicated website for PISA (see <https://www.oecd.org/pisa/data/2015database/>). Hence, getting access to the PISA data for research purposes was a straightforward matter.

The issue of obtaining permission to approach and conduct research in Greek schools is more complicated, though. In order to get approval for any research project to be conducted in Greek schools, researchers have to file a formal application to the Ministry of Education, which will refer the application and the supporting documents to the Institute of Educational Policy (see **Figure 2**) for consideration and formal recommendation. Hence, the first step was that I compiled a folder with the Cambridge Ethics Approval Letter, my supervisor's letter of support, the questionnaires, ethics forms, and official approvals translated in Greek. In the second step, I had to prepare a document outlining the purposes of the current research studies, the benefits for the participants and for Greek education in general, and a justification of the methods that I was going to use. The application's

approval was delayed because of the low speed of processing of the applications, but the Ministry of Education granted me approval to conduct my research (see **Appendix B**).

Despite the official approval from the Ministry, participation in the studies was voluntary and schools and students participated voluntarily. To manage to conduct the research, I personally visited 40 secondary schools from both urban, semi-urban, and rural areas in Attica and Western Greece to get a good coverage of opinions. The first visit to the schools was a simple meeting with the principals/ headteachers in order to explain the purposes of the research and what was required from the schools and the students if they wished to participate. As might have been expected, half of the schools did not accept to participate in the research. This left me with a total number of 19 schools for the quantitative Study 1 and 7 schools for the qualitative Study 3. Some schools agreed to participate in both phases of the research, but the vast majority of schools agreed to participate only in the quantitative phase of the research. Five schools that participated in the interview study came from schools that participated in the quantitative Study 2, too.

For those schools that agreed to participate after consultation between the principals and the within-school teachers' association (i.e., all teachers in a school collectively comprise a teachers' association that make several decisions about the day-to-day within-school management), I had to visit another time to hand over the printed consent forms and the information sheets for the parents. Principals/ headteachers were responsible for collecting and counting the number of signed consent forms and creating lists with the students' names, who agreed to participate. Afterwards, in consultation with the principals, I visited the schools again to administer the survey questionnaires and/ or conduct the interviews during class time. The Greek Ministry of Education permitted a maximum of two teaching hours per school for me to engage students in research during class time (see **Appendix B**). This restriction understandably limited the extent of research that could be conducted in a single school. Due to time constraints, some schools requested that I visit twice, staying within the two-hour limit, to complete the research with the students. Overall, the administration of the quantitative survey and the qualitative interviews was completed successfully.

## Empirical studies on academic achievement

**Chapter 4. Study 1- Unravelling the Complexity of the  
Associations between Students' Science Achievement,  
Motivation, and Teachers' Feedback**

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### Abstract

In recent decades, national science achievement in Greece is following a declining trend. A commonly held assumption is that achievement declines may occur either due to low quality teaching practices or due to students' low motivation. Whilst motivational beliefs have been linked with achievement, there is not enough evidence connecting these motivational constructs with teachers' feedback, which can play an important role in nurturing both students' motivation and achievement. Given that less is known about how these variables collectively function in predicting students' science achievement, the present study draws upon the Greek (N=5,532 students, N=211 schools) PISA 2015 dataset to address this issue. A serial multiple mediation multilevel structural equation model was deployed. The results illustrated that the association between feedback and science achievement was partially mediated by the complex network of associations between students' motivational beliefs. Intrinsic motivation was the strongest predictor of achievement, whilst feedback positively predicted students' motivational beliefs. Unexpectedly, feedback was a negative predictor of achievement both at the individual and school level. The results suggest that interventions are needed to target specifically teachers' feedback practices and intrinsic motivation.

*Keywords:* achievement motivation; motivational beliefs; science achievement; PISA; teachers' feedback;

#### 4.1. Introduction

A comparative inspection of the time-series of the Greek national achievement in secondary schools indicates a decreasing trend in science achievement (OECD, 2014, 2016a, 2019b). While there are many possible factors contributing to this trend (e.g., school, family, peers), it is argued that the most proximal factors influencing achievement, that are of educational and psychological importance, are those related to processes taking place in schools, classrooms and students themselves, such as teaching strategies as well as students' motivation to learn. More distal factors, such as the structure of the educational system or the national curriculum, are typically stable and beyond the influence of students and teachers in centralised governing systems, such as the Greek one (Kougias & Efsthopoulos, 2020). The psychological processes, though, that are under the explicit control of the learners are malleable to change (Winne & Nesbit, 2010), and, thus, susceptible to psychoeducational interventions. One of the most critical psychological factors affecting students' learning and achievement is motivational beliefs, such as self-efficacy, intrinsic and extrinsic motivation, and goal orientations (cf., Hulleman et al., 2010; Karakolidis et al., 2019; Katsantonis, 2020; Pitsia et al., 2017; Richardson et al., 2012; Skaalvik & Skaalvik, 2006). Hence, the question remains whether academic achievement can be explained in part by students' motivational beliefs.

The teaching quality, narrowly defined as strategies/ practices implemented by teachers, could also be an explanatory factor of the declines in academic achievement (Schleicher, 2016; H. S. Yi & Lee, 2017). In fact, research on teaching effectiveness has posited that teachers' behaviours and what occurs in classrooms are the most significant factors for explaining student outcomes and the development of metacognitive skills (Caro et al., 2016; Cordero & Gil-Izquierdo, 2018). Among the many teaching strategies documented in the literature, feedback practices seem to be powerfully related to students' academic motivation (Hattie & Timperley, 2007; T. Jansen et al., 2022) and achievement (Hattie & Timperley, 2007; Wisniewski et al., 2020). Nevertheless, teachers' feedback may not always have a positive influence on students' achievement (Swaffield, 2008) due to various reasons that will be described below. Additionally, empirical evidence is inconclusive regarding the nature of the potential impact of this powerful teaching strategy on students' motivational beliefs.

Hence, the current study draws upon three main theoretical perspectives, namely the self-determination theory of intrinsic vs. extrinsic motivation (Ryan & Deci, 2000, 2016, 2020), the social-cognitive theory of self-efficacy (Bandura, 1997), and the goal orientation theory (Ames, 1992; Ames & Archer, 1988; Nicholls, 1984). Motivational beliefs, such as self-efficacy, intrinsic and extrinsic motivation, and goal orientations, have been found to be critical factors affecting students' learning and achievement. Similarly, feedback practices have been identified as a powerful teaching strategy that could potentially improve students' academic motivation and achievement. However, the nature of the potential impact of feedback on students' motivational beliefs is still unclear.

In short, the aim is to investigate the relationship between students' motivational beliefs, teachers' feedback practices, and science achievement in Greek secondary schools. Specifically, I seek to answer the following overarching research question: How do students' motivational beliefs and teachers' feedback practices collectively function as a system to predict science achievement in Greek secondary schools? By examining the relationship between students' motivational beliefs and teachers' feedback practices, this study aims to contribute to researchers' understanding of the most effective pathways towards improved science achievement in Greek secondary education.

#### 4.1.1. Complex relations between students' motivational beliefs

Although achievement motivational beliefs are many (Eccles & Wigfield, 2002; Wigfield et al., 2021), I attempt to model the relationships between self-efficacy, performance-approach goal orientation, and intrinsic and extrinsic motivation in this study. These motivational beliefs have been postulated as essential components that drive students' forethought stage of self-regulated learning, with the latter construct encompassing use of cognitive and metacognitive strategies to monitor, control, and regulate learning (Zimmerman et al., 2017; Zimmerman & Moylan, 2009). Understanding how these motivational factors, which were available in the dataset, are linked with feedback practices could have implications for improving students' self-regulated learning, too. Hence, in this section, I briefly review some of the extant empirical evidence of the links between these motivational beliefs.

Recent empirical evidence illustrated that self-efficacy, defined as personal persuasive judgement of one's capability to complete an academic task or activity with success (Ferla et al., 2009), was a significant predictor of higher intrinsic motivation (i.e., enjoyment and interest) and lower extrinsic motivation above and beyond demographic influences (McGeown et al., 2014). Similarly, a study with middle school students found that self-efficacy strongly predicted students' intrinsic motivation which, in turn, predicted effort, persistence, and help-seeking behaviour (Skaalvik et al., 2015). Thus, I hypothesise that self-efficacy would predict greater intrinsic (H1) and lower extrinsic motivation (H2).

More complicated appear to be the structural relationships between self-efficacy and goal orientations, defined as the aims/purposes why students engage in learning tasks (Ames, 1992; Ames & Archer, 1988a; Elliot et al., 2017; Wigfield et al., 2021). These relationships are mostly undertheorised and underexplored in the empirical literature. The general consensus, though, is that noteworthy correlations exist between self-efficacy and goal orientations (Ilishkina et al., 2022; Midgley et al., 1998; Skaalvik, 1997). What is not unanimously agreed is the directional nature of this relationship. That is, some studies found evidence in favour of a direct pathway from goal orientations to self-efficacy (Coutinho & Neuman, 2008; Midgley et al., 1995; Roeser et al., 1996), whilst other studies indicated a reverse pathway from self-efficacy to goal orientations as will be discussed below.

According to the trichotomous model of goal orientations (mastery, performance-approach, performance-avoidance) (Elliot & Harackiewicz, 1996), perceptions of competence and ability are assumed to be antecedents of mastery (engaging with a task to improve competence) and performance goal orientations (engaging with task to demonstrate competence), where high perceptions of competence predict greater approach goals (mastery and performance-approach), whilst low perceptions predict greater avoidance goals (performance avoidance) (Elliot & Hulleman, 2017). Hence, I follow previous theoretical evidence (Elliot & Hulleman, 2017) and argue that some form of self-awareness is needed before students can opt for a specific goal orientation. Therefore, it could be argued that students' self-efficacy, as a perception of capabilities, is needed prior to deciding on whether to approach (performance-approach) or avoid a task (performance-avoidance). This theoretical perspective has informed more recent studies. For instance,

empirical evidence (Diseth, 2011; Putarek & Pavlin-Bernardić, 2020; Skaalvik & Skaalvik, 2006) illustrated that self-efficacy positively predicted performance-approach goals and mastery goals. Thus, I hypothesise that self-efficacy would predict greater performance-approach goal orientation (H3). Given that empirical research has shown that all the above motivational constructs influence students' achievement outcomes (Carpenter, 2007; Cellar et al., 2011; Taylor et al., 2014), I expect positive effects on science achievement (H4).

This brief overview lays the groundwork for the current study. Although these motivational psychological variables are firmly grounded in substantial empirical and theoretical evidence, I argue that it is not well established how they function collectively in predicting students' science achievement and what the nature of the relationships between them may be. Moreover, few empirical studies have examined what the role of teachers' feedback, as a powerful predictor of achievement itself (Hattie & Timperley, 2007), may be in shaping students' motivations. Hence, in the following section, I discuss the role of teachers' feedback in shaping students' motivation and achievement.

#### 4.1.2. Powerful but controversial effects of feedback

Feedback can be defined as information given from an agent (i.e., a teacher, in this case) regarding different aspects of one's (i.e., a student's) performance (Wisniewski et al., 2020). According to theoretical accounts of feedback (Hattie & Timperley, 2007; Wisniewski et al., 2020), feedback usually influences students' motivational beliefs and academic achievement and the literature records many types of feedback (e.g., summative, formative, negative, positive, self-referenced, etc.) that influence outcomes differently (Kluger & DeNisi, 1996). The literature on teachers' feedback suggests that there are several types of feedback that can be offered to students. For instance, if the feedback is provided for summative assessment (e.g., end of term exam), then it has a judgemental nature, whereas, if the feedback is offered within the framework of formative assessment, then it has a more descriptive nature (Swaffield, 2008). The impact of feedback is not always positive, even though in education it is considered a "good thing" (Swaffield, 2008). In fact, a large-scale meta-analysis of 131 studies revealed that about 40% of the effect sizes documenting the association between feedback and attainment were negative (Kluger & DeNisi, 1996). This is further confirmed by experimental evidence. For example, an experimental study examining

the impact of feedback on academic achievement illustrated that formative instead of knowledge of results feedback was perceived as more useful and was associated with greater positive change in academic achievement and interest (Harks et al., 2014). The Harks et al. (2014) study also reported that grade-oriented feedback was associated with a negative change in academic achievement (less achievement). On the other hand, students themselves may not interpret or incorporate feedback appropriately. An influential review notes that students may not perceive feedback as something positive since may highlight their low competence and/or lack of skills, or they may fail to understand that feedback can act as a helpful guideline (Black & Wiliam, 1998). With respect to the frequency of teachers' feedback practices in class, it is noted that it is generally low (Hattie & Timperley, 2007). Nevertheless, given that most of the extant evidence indicates a positive association between feedback and achievement, I expect a positive predictive relationship (H5).

With regards to the links between feedback and students' motivation, the literature suggests that the nature of the relationships between feedback and motivational variables is more complex than it seems. Depending on the target (i.e., self or task) and the nature (i.e., positive or negative) of feedback, Hattie and Clarke (2018) note that it can have a beneficial or detrimental effect on students' self-efficacy. In general terms, studies have shown that feedback was associated with higher levels of self-efficacy (Abbas & North, 2018; Chan & Lam, 2010; Duijnhouwer et al., 2010). Hence, I hypothesise that feedback would positively predict self-efficacy (H6). A well-known meta-analysis (Deci et al., 1999) underscored that more positive feedback was positively associated with interest- a component of intrinsic motivation (Ryan & Deci, 2020). A meta-analysis of 78 studies found that negative feedback reduced intrinsic motivation (Fong et al., 2019). Therefore, it is hypothesised that feedback would predict greater intrinsic and extrinsic motivation (H7). A recent experimental study showed that receiving feedback (operationalised as knowledge of results) was associated with higher intrinsic motivation (Abbas & North, 2018). Feedback has also been linked with goal orientations. For example, a study indicated that self-referential compared to normative feedback positively predicted mastery goals and negatively predicted performance (approach and avoidance) goals (Pekrun et al., 2014). Another study reported that normative feedback (i.e., comparison with others) was linked with more performance-approach and performance-avoidance goals, whereas feedback was not connected to

mastery goals (Shin et al., 2017). Subsequently, it is reasonable to expect that feedback will predict greater performance-approach goals (H8).

Nevertheless, it is not well established what would be the simultaneous influence of teachers' feedback on science self-efficacy, performance-approach goal orientation, and intrinsic and extrinsic motivation. Additionally, given that Greek adolescent students are consistently underperforming compared to other countries, it raises the question whether the impact of teachers' feedback is not that positive after all or whether the problem lies with students' low academic motivation. Hence, the need for further research using robust nationally representative data.

#### 4.1.3. The present study

In the current study, I opted for a teaching quality approach. Teaching quality models indicate the importance of teachers' instructional practices for students' motivational and attainment outcomes (Fauth et al., 2019, 2020). Therefore, it is of utmost importance to explore the relationships between teachers' feedback and students' motivational beliefs and achievement. To this end and informed by the reviewed studies, I identified several evidence gaps in the extant literature. Most of the existing studies have examined the relationships between self-efficacy, intrinsic and extrinsic motivation, performance-approach goal orientation, and teachers' feedback in isolation, neglecting how all these variables can be connected in a functional system to promote science achievement. Additionally, existing models are to some extent misspecified since they do not holistically include all these beliefs but students may hold multiple motivational beliefs (Pekrun et al., 2009; Pintrich, 2000a; Wigfield et al., 2015, 2021). Hence, it is of utmost importance to place all these factors in an integrated framework.

Specifically, the study aims to answer the following research questions:

RQ1: How are self-efficacy, performance-approach goals, intrinsic and extrinsic/instrumental motivational beliefs related?

RQ2: How are teachers' feedback, students' motivational beliefs, and science achievement associated?

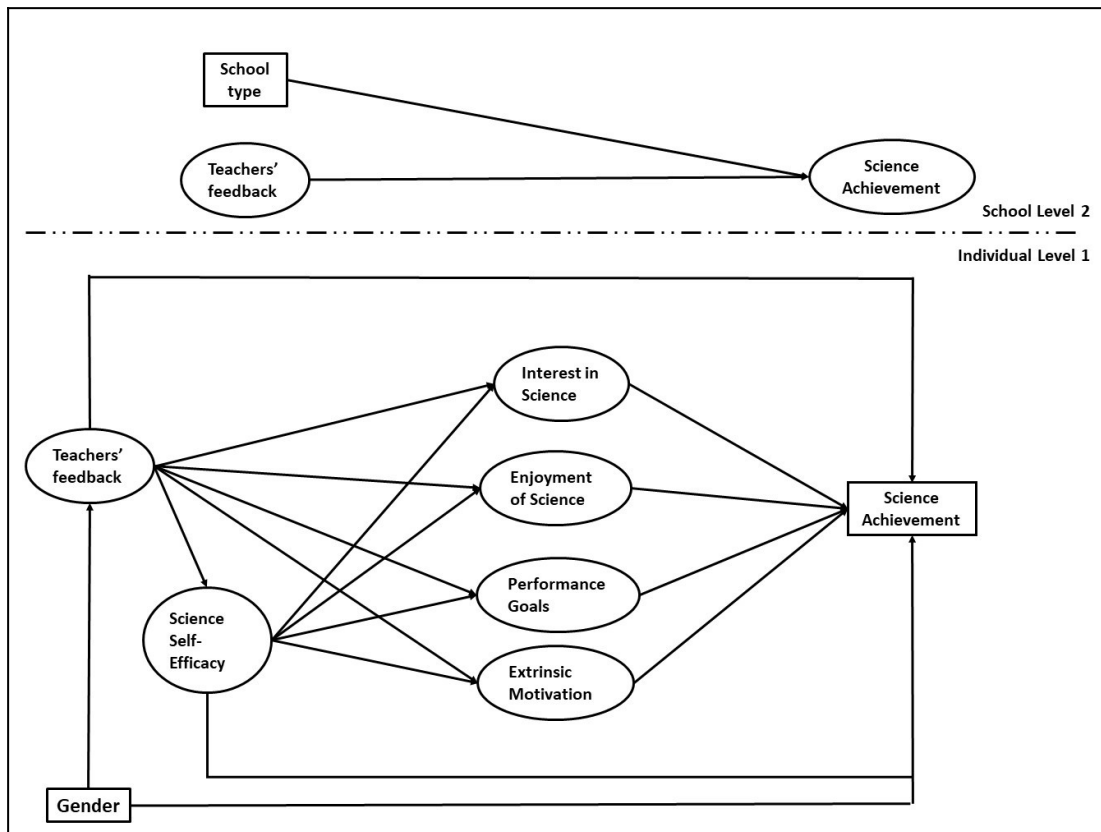


Figure 18. Conceptual multilevel structural equation model © Katsantonis et al. (2023)

As shown in Figure 18, I built and tested a conceptual model that explores the complex structure of the associations between teachers' feedback, self-efficacy, performance-approach goals, and intrinsic and extrinsic/instrumental motivational beliefs while accounting for school effects. In this model, self-efficacy is hypothesised to predict all other motivational beliefs. Feedback also predicts all motivational beliefs. Motivational beliefs are hypothesised to mediate the association between feedback and science achievement, adjusting for covariates. Overall, it is hoped that the findings could inform teacher training programs or educational policies aimed at improving student achievement and motivation.

## 4.2. Method

### 4.2.1 Dataset and participants

Participants of this study are adolescent students aged 15 years old studying in secondary schools in Greece who participated in the *Programme for International Student Assessment* in 2015<sup>10</sup> (PISA- OECD, 2016). This dataset includes a range of motivational beliefs that are not available in previous or later years of the PISA programme. The PISA datasets are publicly available for secondary analyses. The Greek PISA sample with complete data on the key measures of interest amounts to 5,532 adolescent students nested in 211 schools. The sample is about equally distributed to gender groups with 48% being males and 52% being females. 95.8% of the students attended public schools and only 4.2% attended private schools.

### 4.2.2. Measures

All measures were administered in the context of the PISA 2015 testing and were validated through the use of the generalised partial credit Item Response Theory model (IRT) which freely estimates both the difficulty and the discrimination parameters (Muraki, 1992). The scales below show good cross-cultural validity and internal consistency (OECD, 2017). Below, I describe the content and the psychometric properties of the measures. The exact item wordings are available in the **Appendix C**.

#### *Science self-efficacy*

A scale comprising 8 items was indexing students' efficacy beliefs about their capability in executing science-related tasks (OECD, 2016a). Possible response categories were ranging from 1 "I could do this easily" to 4 "I couldn't do this". A sample item is "identify the science question associated with the disposal of garbage". Item responses were reverse-scored so that higher scores indicate greater levels of self-efficacy. Cronbach's alpha reliability coefficient was  $\alpha = .86$ .

#### *Intrinsic motivation- Enjoyment and Interest in Science*

Intrinsic motivation is operationalised in this study to comprise enjoyment of science and interest in science. Students were asked how interested they are in several science-related topics. A 5-items measure indexes interest in science and it is scored using a Likert-

<sup>10</sup> The PISA 2015 data were utilised because later waves do not include all the motivational variables of interest

type scale ranging from 1 “not interested” to 4 “very interested” (OECD, 2016a). The scale’s Cronbach’s reliability coefficient was  $\alpha = .79$ . A sample item is “Motion and forces (e.g., Velocity, friction, magnetic and gravitational forces)”. The enjoyment of science measure consists of 5 items scored using a Likert-type scale ranging from 1 “strongly disagree” to 4 “strongly agree” (OECD, 2016a). Students were asked how much they (dis)agreed with several statements about their enjoyment of science. A sample item is “I like reading about broad science”. The scale’s Cronbach’s reliability coefficient was  $\alpha = .93$ .

#### *Performance-approach goal orientation*

PISA 2015 administered a 5-items measure called the “achievement motivation” scale (OECD, 2016b). Students were asked to rate their (dis)agreement with statements such as “I want to be one of the best students in my class”. I argue that this instrument measures performance-approach goal orientation since its items focus on performance, and the self, and describe competence to outperform others. This interpretation is in line with early works on goal orientations (Ames, 1992; Nicholls, 1984). This scale maps onto the performance-approach dimension of the trichotomous model (Elliot & Hulleman, 2017) of goal orientations. Items were scored using a 4-point Likert-type scale ranging from 1 “strongly disagree” to 4 “strongly agree”. The Cronbach’s alpha reliability coefficient was .73.

#### *Extrinsic motivation- Instrumental motivation*

A 4-items scale measured extrinsic motivation (OECD, 2016a). A sample item is “studying my school science subject(s) is worthwhile for me because what I learn will improve my career prospects”. The instrument is scored using a 4-point Likert-type scale ranging from 1 “strongly agree” to 4 “strongly disagree”. Reverse-scoring was applied so that higher scores indicate greater extrinsic motivation. The Cronbach’s alpha reliability coefficient was  $\alpha = .89$ .

#### *Teachers’ feedback practices*

A 5-items scale was administered to tap into students’ perceptions of how frequently they received feedback regarding their learning goals and performance from their science teachers (OECD, 2016b). Feedback was measured in terms of frequency of personal improvement and was more related to task mastery rather than improvement in terms of

normative performance. A sample item is “the teacher tells me how I am performing in this course”. The possible item response options are 4 and range from 1 “never or almost never” to 4 “every lesson or almost every lesson”. The Cronbach’s alpha reliability coefficient was  $\alpha = .90$ .

#### *Science achievement*

PISA 2015 used a standardised balanced incomplete design, where students responded to different but overlapping batteries of science tasks. Afterwards, given the common items, the different subsets of the test were equated using IRT modelling to place students’ scores on the same continuum (OECD, 2017). This procedure is called test equating or linking (F. B. Baker, 2001). There is no theoretical minimum or maximum for the PISA achievement score; however, it has been standardised with a mean of 500 and a SD of 100 (OECD, 2019b). Given the uncertainty in the computation of students’ science ability estimates, 10 factor scores (called plausible values) were computed for each student, which should be pooled in order to reach valid conclusions (OECD, 2017). The reliability coefficient for the PISA test in Greece was .91.

#### *Control variables*

Gender was used as a control variable for science achievement and teachers’ feedback. Gender differences in achievement (Yu et al., 2020) and feedback perceptions (Cunha et al., 2019; Hattie & Timperley, 2007; Henderlong Corpus & Lepper, 2007) have been reported in the literature. At school-level, school type (private, government funded private, and public) served as a control given that some literature suggests that public schools may have lower student achievement (Boerema, 2009; Peterson & Llaudet, 2006).

#### 4.2.3. Statistical analyses

To begin with the analyses, confirmatory factor analyses with the WLSMV estimator were performed at the individual level to ascertain the extent to which the scales were displaying internal structure validity (T. A. Brown, 2015). Afterwards, the intra-class correlation coefficients were computed to determine whether the variables can be aggregated to the higher level (Heck & Thomas, 2020).

The multilevel serial multiple mediation model was estimated through structural equations under the general structural equation modelling framework in *Mplus* 8.7 (L. K.

Muthén & Muthén, 2017). A structural equation multilevel model with so many ordered-categorical indicators would have been computationally inefficient to estimate due to requiring high dimensional numerical integration (Asparouhov & Muthén, 2007). Hence, summed composite scores were calculated for the motivational variables and feedback, and single-indicator latent factors were formed adjusted for measurement error ( $1 - \alpha$  reliability) (Kline, 2023) so that the multilevel model could be estimated through robust maximum likelihood (MLR). Predictors were grand mean centred in line with methodological guidelines (Hox et al., 2017). Given that 10 plausible values were generated by PISA 2015 per student, I followed existing methodological guidelines (Khorramdel et al., 2020; Laukaityte & Wiberg, 2017) and pooled estimates across all plausible values using Rubin's rules (Rubin, 2004) in Mplus.

A bottom-up model-building approach was adopted. In the first step, I estimated a baseline **Model A** with only the level-1 specification (see Figure 18) plus a random intercept for science achievement. Next, the level-2 specification was added with a random intercept for feedback predicting achievement (**Model B**). An alternative **Model C** was estimated to test possible between-school differences in the motivational beliefs. Finally, I tested whether the hypothesised pathway from self-efficacy to performance-approach goals could be reversed (**Model D**).

To evaluate the models' fit, I used a combination of fit indices. CFI and TLI values close to /above .95 in conjunction with RMSEA and SRMR values less than .06 are indicating a good model-data fit (Hu & Bentler, 1999). These global fit indices are also applicable to the multilevel SEM, however, they may conceal level-specific misspecification since they describe the degree of fit for the whole model (Ryu & West, 2009). It is noted that in multilevel SEM (MLSEM), the only fit index that is available separately for all levels of the analyses is the SRMR (Silva et al., 2019). Thus, the SRMR values are of particular importance in the multilevel SEM analyses. Moreover, the Bayesian information criterion was also considered, which is more effective in selecting the 'true' population model (Bollen et al., 2014). Lower values in the information criteria indicate better model fit and a more parsimonious model (Silva et al., 2019). Given the stratified cluster sampling design implemented by PISA (OECD, 2017), the available sampling weights at both levels, the clustering, and the stratification design information were included in the modelling to adjust

the standard errors (TYPE=COMPLEX). The possibility of common method bias was also examined through the Explained Common Variance (ECV) coefficient (Rodriguez et al., 2016; Sijtsma, 2009), which indexes variance explained by a common general latent factor divided by the total variance explained by the group and the general factors (Reise, 2012). ECV values less than .80 indicate a multidimensional structure (Rodriguez et al., 2016). The ECV was calculated using the *psych* package (Revelle, 2022) in R (R Core Team, 2023).

### 4.3. Results

#### 4.3.1. Preliminary analyses

In the first instance, the data were subjected to CFAs to determine the extent to which the scales are unidimensional. Modification indices were inspected to identify sources of possible misspecification for improvement of model fit (Kline, 2023). The goodness-of-fit indices of CFA per scale are presented in Table 4.

**Table 4. Results of construct validity testing for Study 1**

Scale	Scaled $\chi^2$	CFI	TLI	RMSEA	SRMR
SCIEF	424.568*** (18)	.981	.970	.065	.024
PERF	37.706*** (4)	.996	.991	.039	.014
ENJ	44.854*** (4)	1.00	.999	.044	.003
INT	9.358* (3)	1.00	.999	.020	.005
EXT	14.182** (1)	1.00	.997	.050	.003
TFEED	63.053***	.998	.995	.062	.006

(3)

Note: \*\*\*p<.001; \*\*p<.001; \*p<.05; SCIEF: Science self-efficacy; PERF: Performance-approach goals; ENJ: Enjoyment of science; INT: Interest in science; EXT:

Extrinsic motivation; TFEED: Teachers' feedback

The values in goodness-of-fit indices in Table 4 indicate that all the scales displayed excellent internal structure validity even with some minor modifications (correlated residuals) due to meaning overlap (Bandalos, 2021). Having ascertained the unidimensional nature of the scales, descriptive statistics (Table 5) and bivariate correlations (Table 6) were computed to inspect the distributions and the relationships in the data. The ECV was equal to .36 indicating negligible common method variance (Sijtsma, 2009). From the descriptive statistics, it becomes apparent that the levels of feedback provided are very low; that is, the average feedback is just 5 points higher from the empirical minimum, suggesting that most students did not report high levels of teachers' feedback.

**Table 5. Descriptive statistics for key variables of Study 1**

Variable	Mean (SD)	Min-Max	ICC	Total N
SCIEF	21.55 (5.5)	8-32	.025	4855
PERF	15.05 (2.68)	5-20	.033	5320
ENJ	13.50 (4.02)	5-20	.055	5144
INT	13.23 (3.75)	5-20	.082	4531
EXT	11.51 (3.09)	4-16	.023	5129
TFEED	10.54 (4.04)	5-20	.084	5023
ACHIEV <sup>a</sup>	454.83 (91.92)	-	.414	5532

*Note:* Weighted descriptive statistics adjusting for non-response and complex sampling design. <sup>A</sup>: All 10 plausible values were pooled; ICC: Intra-class correlation coefficient for level 2; SCIEF: Science self-efficacy; PERF: Performance-approach goals; ENJ: Enjoyment of science; INT: Interest in science; EXT: Extrinsic motivation; TFEED: Teachers' feedback

As can be seen from the intraclass correlation coefficients (Table 6), science achievement varies significantly across schools (41.4%). Additionally, only the frequency of

teachers' feedback (8.4%) and interest in science (8.2%) and enjoyment of science (5.5%) varied significantly across schools. However, the hypotheses pertain only to science achievement and feedback, and, therefore, I include random intercepts for these variables only. From the values of the correlation matrix, it can be seen that motivational beliefs are modestly positively correlated amongst themselves. Most notably, teachers' feedback and students' science achievement were negatively correlated.

**Table 6. Model estimated correlation matrix for Study 1 variables**

Variable	1.	2.	3.	4.	5.	6.	7.
1. SCIEF	1						
2. PERF	.195	1					
3. ENJ	.304	.216	1				
4. INT	.312	.203	.618	1			
5. EXT	.299	.181	.490	.352	1		
6. TFEED	.074	.027 <sup>ns</sup>	.133	.125	.131	1	
7. ACHIEV	.239	.189	.344	.364	.138	-.161	1

Note: All correlations were statistically significant at least at  $p < .01$ ; ns not significant. SCIEF: Science self-efficacy; PERF: Performance-approach goals; ENJ:

Enjoyment of science; INT: Interest in science; EXT: Extrinsic motivation; TFEED: Teachers' feedback; ACHIEV: Science Achievement

#### 4.3.2. Unravelling the Complexity between Science Achievement, Motivation, and Teachers' Feedback

To test the hypotheses 1 to 4, a multilevel serial multiple mediation model was built and estimated using a bottom-up approach. At the first step, I specified the regression paths at level 1 (student level) and permitted only a random intercept for science achievement at the school level. This model (**Model A**) had a rather poor fit to the data and especially at the school level, scaled  $\chi^2(6) = 77.227$ ,  $p < .001$ , CFI = .972, TLI = .865, RMSEA = .046, SRMR<sub>WITHIN</sub> = .016, SRMR<sub>BETWEEN</sub> = .437. In addition, the information criteria reached the following values, BIC = 169184.915, AIC = 168926.802, sBIC = 169060.985. In a second model (Model B), a random intercept for teachers' feedback frequency was added at the school level along with the control variable, and the regression paths to achievement. **Model B** had very good fit at

all levels, scaled  $\chi^2$  (6)= 53.350,  $p<.001$ , CFI=.984, TLI=.916, RMSEA=.038, SRMR<sub>WITHIN</sub>=.016, SRMR<sub>BETWEEN</sub>=.023. In addition, the information criteria confirmed that Model B is improved, BIC= 169072.193, AIC= 168787.606, sBIC= 168935.552. Further covariates (e.g., socio-economic status; immigrant status, etc.) were included at both levels; however, the fit indices rejected those models.

Given that more than 5% of the variance for enjoyment and interest could also be explained by school-level factors (Table 5), a model (C) was estimated with enjoyment and interest as school-level random intercepts predicting achievement. **Model C's** fit to the data significantly deteriorated, scaled  $\chi^2$  (11) = 175.774,  $p<.001$ , CFI=.945, TLI=.808, RMSEA=.052, SRMR<sub>WITHIN</sub>=.01, SRMR<sub>BETWEEN</sub>=.337. Further, the information criteria confirmed this degradation in model-data fit, BIC= 169236.541, AIC= 168925.481, sBIC= 169087.190. Hence, the conceptual model was the best amongst the alternative models examined.

In addition to the conceptual model, a nested model (**Model D**) was estimated where performance-approach goal predicted self-efficacy, instead of the reverse. This was done to ascertain the flow of effects given the debate regarding the nature of this relationship. The model with the reverse path was significantly worse fitting to the data variance-covariance matrix and the information criteria confirmed this, scaled  $\chi^2$  (9)=145.828,  $p<.001$ , CFI=.953, TLI=.837, RMSEA=.052, SRMR<sub>WITHIN</sub>=.039, SRMR<sub>BETWEEN</sub>=.023, BIC= 169434.251, AIC= 169169.519, sBIC= 169307.144. The models' fit indices are presented comprehensively in Table 7. Thus, self-efficacy was better represented as predicting performance-approach goals and not the reverse. Standardized parameter estimates for the conceptual Model B, which displayed the best fit, are shown in Figure 19. Statistically non-significant parameters are depicted with dashed lines. All non-dashed lines represent regression paths that reached statistical significance at least at the 5% level.

**Table 7. Fit indices for two-level models A- D.**

Model	CFI	SRMR within	SRMR between	BIC
Model A	.972	.016	.437	169184.915
Model B	.984	.016	.023	169072.193
Model C	.945	.01	.337	169236.541

Model D	.953	.039	.023	169434.251
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Note: CFI: Comparative Fit Index; SRMR: Standardised Root Mean Residual; BIC: Bayesian Information Criterion

As can be seen in **Figure 19**, self-efficacy positively predicted science achievement,  $\beta=.119$ ,  $p<.001$ . Similarly, interest in and enjoyment of science were positive predictors of achievement,  $\beta=.180$ ,  $p<.001$ ;  $\beta=.193$ ,  $p<.001$ , respectively. Performance-approach goals also were a positive predictor,  $\beta=.079$ ,  $p<.001$ , whereas, adjusting for the rest of the motivational constructs, extrinsic motivation undermined achievement,  $\beta=-.061$ ,  $p<.01$ . Self-efficacy was a strong positive source for all other motivational constructs with the regression path coefficients ranging from  $\beta=.191$  (performance-approach goals) to  $\beta=.303$  (extrinsic motivation). Higher frequency of teachers' feedback had beneficial influence on self-efficacy,  $\beta=.094$ ,  $p<.001$ , enjoyment,  $\beta=.276$ ,  $p<.001$ , interest,  $\beta=.156$ ,  $p<.001$ , and extrinsic motivation,  $\beta=.121$ ,  $p<.001$ , whilst it had no impact on performance-approach goals,  $\beta=.030$ ,  $p>.05$ . Surprisingly, higher frequency of teachers' feedback was associated with lower science achievement both at the student level,  $\beta=-.135$ ,  $p<.001$ , and the school level,  $\beta=-.799$ ,  $p<.001$ . Given that the indirect effects were very small, they are not reported.

With respect to the control variables, gender (female) was a negative predictor of both achievement,  $\beta=-.058$ ,  $p<.01$ , and feedback,  $\beta=-.165$ ,  $p<.001$ . Attending public schools was associated with lower achievement between schools compared to private schools,  $\beta=-.227$ ,  $p<.001$ . At the school level, the model explained 69% of the variance of between-school differences in achievement, whereas the model explained 15.3% of the variance of between-student differences at the student level.

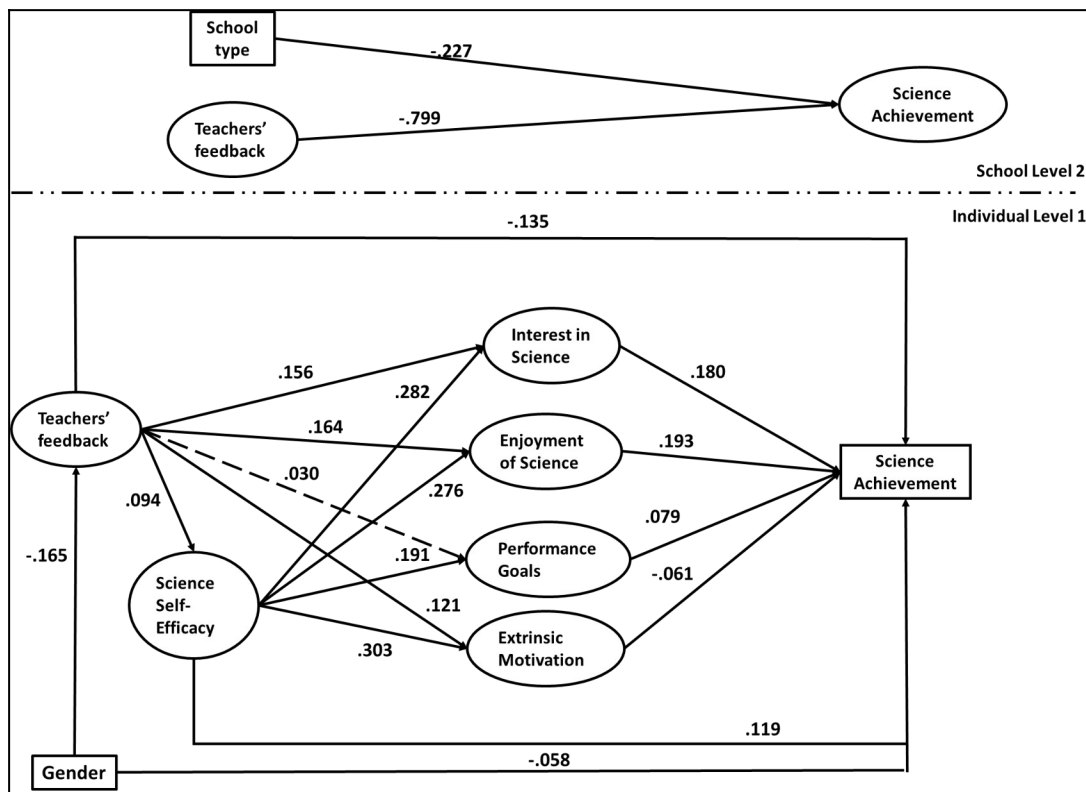


Figure 19. Standardised parameter estimates of the MLSEM (Model B) © the Author

#### 4.3.3. Robustness analysis: Testing the predictive effect of language teachers' feedback on students' reading achievement with PISA 2018

Given the negative relation between teachers' feedback and academic achievement both at the individual-level and the school-level, a sensitivity analysis was conducted with the Greek ( $n=6403$  students) PISA 2018 dataset (OECD, 2019b) to explore the nature of the relation between feedback and reading (i.e., a language-related skill) achievement. The simple regression unstandardised coefficient for teachers' feedback was  $\beta = -1.266$ ,  $p = .306$ , indicating a similar negative association that did not reach statistical significance. Therefore, in both science and language domains, the quantity of perceived teachers' feedback did not have a positive effect on achievement.

#### 4.4. Discussion

Motivated by the declining science performance in Greek secondary schools, the present study, following a pragmatist perspective, sought to clarify the extent to which motivational factors and teachers' feedback practices may be linked with achievement. Specifically, this study was informed in part by three prominent achievement motivation

theories, namely SDT (Ryan & Deci, 2020), social-cognitive theory (Bandura, 1997), and goal orientations theory (Ames & Archer, 1988a; Nicholls, 1984). In brief, I aimed to disentangle the complexity between self-efficacy, intrinsic and extrinsic motivation, performance-approach goals, and teachers' feedback. Hence, the contribution of this study is twofold. Firstly, the theoretical contribution of this work is that I merged parallel strands of achievement motivation research with feedback under a unified framework in predicting science achievement. Secondly, the educational contribution of this study is that through this unified approach it is possible to gain a better understanding of how one could structure successful interventions to increase science achievement.

#### 4.4.1 Associations between motivational beliefs

In greater detail, several hypotheses guided the present research. The first research objective was to estimate the effect of self-efficacy on the other motivational constructs. The MLSEM results illustrated that science self-efficacy (i.e., an academic self-efficacy) was a substantial predictor of greater intrinsic (enjoyment, interest) and extrinsic motivation, and higher performance-approach goals. The positive effect of self-efficacy on intrinsic motivation is a finding which coincides with previous empirical evidence suggesting such associations (McGeown et al., 2014; Skaalvik et al., 2015). Hence, H1 was confirmed. Despite that, higher science self-efficacy was predicting higher extrinsic motivation, which is a unique finding since past evidence suggested that this association was negative (Ilishkina et al., 2022; McGeown et al., 2014). Thus, H2 was rejected. This finding probably depends on the pedagogical context of Greece. Since the context promotes performance structures (value of good normative performance ahead of national exams), then feeling able to do something might mean being motivated to demonstrate good performance. As the model shows this does not necessarily translate to better achievement though, quite the opposite.

Another research hypothesis pertained to the directional nature of the relationship between science self-efficacy and performance-approach goals. What is not well-established is that self-efficacy can predict goal orientations. Most of the preceding empirical studies have indicated that goal orientations predict self-efficacy (Coutinho & Neuman, 2008; Midgley et al., 1995; Roeser et al., 1996), despite the trichotomous model of goal orientations suggesting that perceptions of ability and competence are antecedents of

performance-approach goals (Elliot & Harackiewicz, 1996; Elliot & Hulleman, 2017; Elliot & Thrash, 2001). To the best of my knowledge, only three studies have estimated the reverse path (Diseth, 2011; Putarek & Pavlin-Bernardić, 2020; Skaalvik & Skaalvik, 2006). The argument that I put forward here is that a degree of metacognitive judgement of capabilities in science (i.e., science self-efficacy) is needed prior to the adoption of a specific goal orientation. This argument has found empirical support since the MLSEM model D was rejected. This signifies that higher science self-efficacy was predicting greater levels of performance-approach goals (Model B). Hence, H3 was confirmed.

#### 4.4.2. Teachers' feedback effects on motivational beliefs and science achievement

Another objective was to confirm that all motivational constructs would predict students' science achievement. The modelling (Model B) results underscored the fact that students' academic motivations were good predictors of achievement. Much can be said about the positive effect of motivation on students' achievement, but suffice to say that the literature supports the positive links between self-efficacy and academic achievement (Carpenter, 2007; Schunk et al., 2014; Taylor et al., 2014). Although early literature on performance goals has associated performance goals with maladaptive patterns of learning such as surface learning (Anderman & Young, 1994; Kaplan & Maehr, 2007; Midgley et al., 1995), the present results disagree to the extent that performance-approach goals weakly predicted higher science achievement. This result is in agreement with the findings of a large meta-analysis that suggested that performance-approach goals with normative reference were positively, but weakly, associated with academic outcomes (Hulleman et al., 2010). Another finding is that extrinsic motivation was negatively predicting science achievement. Despite that extrinsic and intrinsic motivation are not necessarily antagonistic (Cerasoli et al., 2014) and that a little extrinsic motivation may be needed to be academically flourishing (Y.-G. Lin et al., 2003), the current findings concur with recent empirical literature that found support for the negative consequences of extrinsic motivation on achievement after adjusting for intrinsic motivation (Areepattamannil et al., 2011; Karlen et al., 2019; Lemos & Veríssimo, 2014). Furthermore, the present negative effect of extrinsic/instrumental motivation indicates that the influence of extrinsic motivation on achievement is, indeed, non-additive, adjusting for the rest of the motivational constructs. Overall, H4 was partially supported.

Another research objective pertained to the role of feedback in promoting science achievement. The present approach differs from preceding evidence since it sought to explore from a multilevel perspective the impact of feedback both between students and between schools. Although extant literature suggests that feedback can usually be a powerful positive predictor of achievement at the individual-level (Hattie & Clarke, 2018; Hattie & Timperley, 2007), the current study found that higher frequency of feedback was predicting lower achievement both between schools and students. This finding is not entirely unprecedented, though, since a large-scale meta-analysis found that about 40% of the associations between feedback and achievement were negative (Kluger & DeNisi, 1996). Nevertheless, the present data do not allow us to identify the source of this controversy. However, this result may point towards deficits in teachers' feedback strategies (i.e., low quality of feedback) or that feedback is offered exclusively to low-achievers and is not provided to all students. An alternative hypothesis pertaining to the negative nature of this effect is that feedback was provided in an unclear way which induced low performance (Hattie & Timperley, 2007). Additionally, students themselves may not have interpreted feedback positively and, thus, any improvements in achievement may not have been consolidated given that feedback may have been interpreted as judgemental of their (cap-)abilities. This interpretation seems plausible given that Black and William (1998) mention that students may fail to comprehend feedback appropriately. Thus, H5 was rejected.

Additionally, the multilevel modelling showed that feedback was a significant predictor of self-efficacy, intrinsic and extrinsic motivation, but not of performance-approach goals. Thus, H6 and H7 were supported, but H8 was rejected. This finding is in line with preceding evidence indicating that feedback predicted self-efficacy (Chan & Lam, 2010; Duijnhouwer et al., 2010; Hattie & Clarke, 2018) and intrinsic (Deci et al., 1999) and extrinsic/instrumental motivation (Guo & Wei, 2019; Oker et al., 2020). Although previous studies reported that feedback predicted performance-approach goal orientation (Pekrun et al., 2014; Shin et al., 2017), the MLSEM results showed that the path from teachers' feedback to performance-approach goals did not reach statistical significance. This finding may be linked with the nature of the feedback. Specifically, feedback was measured in terms of frequency of personal improvement, and, thus, was more related to task mastery

rather than improvement in terms of normative performance. Hence, this may explain why feedback had no impact on performance-approach goals.

#### 4.4.3. Strengths and limitations of Study 1

Although the present study is not without any limitations, it should be noted first that it has many strengths. For instance, a large nationally representative sample of about 5500 students was used, which exceeds the median samples in psychology or education (Kline, 2023). Additionally, the sample was representative of secondary schools' student population in Greece, which suggests that these findings are generalisable to the wider population. Moreover, the present dataset allowed me to collectively examine the relations between some of the most prominent academic motivational constructs, which is not usually feasible through primary data collection. Further, the multilevel perspective permitted the examination of the true nature of feedback effects at both student and school level. Nevertheless, the present approach was constrained since there were no available data on mastery goals and avoidance performance goals, or the quality and nature of teachers' feedback practices. Furthermore, the cross-sectional nature of the data did not allow for causal conclusions. More research is also needed with representative sample to ascertain whether the nature of the relationship between feedback and achievement is indeed negative between students and schools. Moreover, the dataset is a little bit outdated, however, since the competence indicators (Dominguez-Gil et al., 2022), the curriculum, and pedagogical structure of the Greek educational system remain relatively stable over time (Kougias & Efstathopoulos, 2020) I could assume that the findings are still pertinent but need to be replicated using other more established measures for cross-validation.

#### 4.4.4. Implications for educational policy and practice

Despite any limitations of this work, the findings have potential implications for educational policy and practice. Specifically, the MLSEM revealed that intrinsic motivation and, especially, enjoyment of science, was the most beneficial predictor of science achievement in Greece. Therefore, the national curriculum's focus could be shifted more towards enhancing students' enjoyment of science. Additionally, teachers should invest in

new methods that would make the content knowledge more enjoyable and interesting to the students. Of course, these suggestions would require a shift from the traditional instructionist model of teaching and the stage-like structured teaching of academic subjects implemented in Greek schools (Bulle, 2011). My findings may have implications for the Italian, Spanish, and French educational systems that follow similar curricular and pedagogical structure as the Greek educational model (see Bulle, 2011). In order to improve science achievement, I also recommend more evidence-based interventions that place emphasis on both cognitive (e.g., self-efficacy) and emotional (e.g., enjoyment, interest, goal orientation) motivational forces since my results indicated that these had a positive effect on achievement. In contrast, parents and/or teachers should make an effort to restrict explicit instrumental expectations since extrinsic/instrumental motivation has a deleterious effect on achievement.

Beyond students' motivation, greater emphasis should be placed on promoting highly qualitative teachers' feedback practices. The present findings suggest that high frequency of feedback was linked with lower achievement, at least in this context. This would suggest the need for further teacher training that would place emphasis on appropriate strategies for the delivery of feedback, especially since secondary school teachers in Greece may not have taken any pedagogical courses (Bista et al., 2016). Feedback frequency was generally found to be low; however, students may not be able to recognise or appreciate feedback. Thus, I recommend explicit provision of constructive feedback targeted specifically at the students' work. Offered feedback should also not be negative, controlling or uninformative, but should be highly informative and focused both on areas for improvement and specific strategies to improve students' learning (Wisniewski et al., 2020).

#### **4.5. Conclusion**

In conclusion, the above findings indicate that teachers' feedback and students' motivation do not work, as well as expected, in a system that brings to bear positive changes in students' achievement- at least in this context. Although teachers' feedback had a positive impact on students' motivational beliefs, this positive impact does not directly translate to increases in students' science achievement in Greece. This is supported by the inconsistent mediation effects that cancel each other out, resulting in a total effect

(MacKinnon et al., 2000) of teachers' feedback that is zero for achievement. Thus, the feedback's predictive effects- at least as measured in the current study- are not as powerful as the literature portrayed them to be, instead students' motivations are more powerful.

**Chapter 5. Study 2- Person-centred study on higher-order interactions between students' motivational beliefs and metacognitive self-regulation: Links with school language achievement**

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### Abstract

Variable-centred studies assume that the links between motivation and metacognition with academic achievement are uniform across all students. However, this assumption may not hold and multiple interactions between motivational beliefs and metacognitive self-regulation may occur. To this end, the present study sought to explore these higher-order interactions and their links with school language achievement in a low-performance context. A large sample ( $N=1046$ , 53.14% girls) of Greek secondary school students ( $M=13.97$ ,  $SD=.80$ ) was drawn. Latent profile analyses were deployed to mimic higher-order interactions. Unexpectedly, the results indicated only three distinct well-defined profiles of students' motivated metacognitive self-regulation, namely exceptional motivation and metacognitive self-regulation (23.3%), adequate motivation and metacognitive self-regulation (48.2%), and minimal motivation and metacognitive self-regulation (28.5%). Incompatible profiles of motivation and metacognitive self-regulation did not emerge, contrary to previous findings suggesting negative higher-order interactions. The BCH method revealed large mean differences in school language achievement between the profiles, adjusting for covariates. Latent multinomial logistic regression indicated that gender and age predicted greater odds of membership to the minimal motivation and metacognitive self-regulation profile. Socio-economic status and spoken language at home predicted less chances of membership to the minimal profile only. Educational interventions are needed to target both motivational beliefs and metacognition to prevent underachievement.

*Keywords:* motivational beliefs, metacognitive self-regulation, person-centred study, socio-economic status, age, latent profile analysis, academic achievement, interactions

### 5.1. Introduction

Motivation and metacognition have been posited as important components of students' self-regulated learning (SRL) (Efklides, 2011; Zimmerman, 2008; Zimmerman et al., 2017) and have been linked with adaptive student outcomes, such as achievement (Huang, 2016; Karlen et al., 2019; Katsantonis, 2020; Říčan et al., 2022). However, extant studies make an assumption that may not be tenable; that is, they take a variable-centred approach and assume that the links between students' motivational beliefs and application of metacognitive strategies are uniform across all sample members (Cleary & Kitsantas, 2017; Zheng et al., 2021). In other words, these studies estimate "averaged" separate effects of motivation and metacognition on achievement. In reality though, students in a sample may constitute a heterogeneous population and demonstrate different levels of motivation and metacognition that are connected differentially with achievement. However, profiling studies of motivation and metacognitive self-regulation are inconclusive. To address this important gap in extant research, I can deploy a person-centred latent profile analysis that assigns students in groups with similar characteristics and is able to mimic higher-order interactions (D. Bauer & Shanahan, 2007; Lanza et al., 2010) between multiple motivational variables and metacognitive self-regulation.

Some person-centred studies have explored heterogeneity in students' motivational and metacognitive characteristics and potential connections with achievement (Chon & Shin, 2019; Karlen, 2016; L. Lin et al., 2021). However, most of these studies use university/college samples. Consequently, their findings do not reflect the motivational and metacognitive processes that take place in secondary school classrooms during adolescence when metacognitive abilities are malleable and subject to developmental spurt (Weil et al., 2013) and academic motivation usually declines (Fredricks & Eccles, 2002; Gottfried et al., 2007; Wigfield et al., 2015). Additionally, extant studies were conducted in high-performance contexts (e.g., USA, Germany, China, etc.), as defined by PISA rankings (OECD, 2019b), and do not illustrate what occurs in low-performance contexts, such as the Greek one (Katsantonis et al., 2023) that is the focus of the present study. Finally, there exist studies that explore secondary school students' motivational or metacognitive strategies separately (Kwarikunda et al., 2022; Tóth-Király et al., 2022), whereas I need to consider

both aspects simultaneously to identify potential areas for theoretical and practical educational innovations.

Hence, the present study sought to address these important gaps in the literature by exploring unobserved heterogeneity and higher-order interactions between motivational beliefs and metacognitive strategies of adolescent secondary school students.

#### 5.1.1. Interactions between motivation and metacognition in self-regulated learning

Current models of self-regulated learning (Efklides, 2011; Pintrich, 1999; Zimmerman, 2008; Zimmerman et al., 2017) integrate both metacognitive processes and academic motivational beliefs and postulate that learners need to activate both in order to be academically successful. Metacognition is broadly defined as “cognition about cognition” and involves cognitive processes that take place on a “meta-level” requiring monitoring and control of cognition (Flavell, 1979). In the present study, the focus is specifically on metacognitive self-regulation which is defined as the regulation of cognitive processing (i.e., planning, monitoring, and regulating strategies) instead of metacognitive knowledge (Tock & Moxley, 2017) since metacognitive self-regulation is considered a higher-order process that reflects students’ ongoing processing and strategies deployed to improve performance, rather than static general knowledge about the person, task, and strategies (Nietfeld et al., 2005). Motivation is broadly defined as the forces that make people act and academic motivation comprises self-beliefs of competence (e.g., self-efficacy), goals (e.g., goal orientations), and intrinsic (e.g., interest) and extrinsic (e.g., incentives) motivation, amongst others (Wigfield et al., 2021).

Empirical research has indicated how critical motivation is for metacognition (Katsantonis, 2020; Sungur, 2007). Additionally, other researchers have specified both motivation and metacognition as joint predictors of students’ performance (Coutinho & Neuman, 2008; Metallidou & Vlachou, 2007; Özcan, 2016; Pérez-González et al., 2022). Yet, these studies have not captured the complexity of self-regulated learning since they have not tested the multiplicative effects of motivational beliefs with metacognition. As Efklides et al. (2018) accurately mention, self-regulated learning is not only informed by the recursive prediction from motivation and metacognition but also by the interactions between these components. This study adopts Efklides’ (Efklides, 2011) MASRL model of self-regulated learning- which takes an interactionist perspective. The MASRL is structured

at two levels, namely the person-level and the task X person level (Efklides, 2017). The person-level is more generic and encompasses the interactions between students' relatively trait-like cognitive, metacognitive, motivational, and emotional characteristics, whereas the task X person level involves cognitive, emotional, and motivational regulation while engaging with a task (Efklides, 2019). At each level of the model, it is hypothesised that the postulated components would interact (Efklides, 2011). The present study focuses only on the motivational and metacognitive self-regulatory aspect at the person-level. However, the directional nature of these interactions is under-researched.

Students' motivational beliefs positively correlate (Putarek & Pavlin-Bernardić, 2020; Ross et al., 2016; Skaalvik et al., 2015) indicating that students hold multiple motivational beliefs at the same time. Thus, the number of possible interactive effects of motivation with metacognitive self-regulation becomes large and difficult to estimate (Harrell, 2015). Therefore, the present study contributes to theoretical models of self-regulated learning by deploying a person-centred latent profile model to explore the higher-order interaction of motivation and metacognitive self-regulation (i.e., self-efficacy X mastery goal X performance goal X intrinsic motivation X extrinsic motivation X metacognitive self-regulation) and to link this with school language achievement.

### 5.1.2. Related profiling approaches to the study of motivation and metacognitive strategy use

As will be shown below, several studies have explored the interactions of students' metacognitive self-regulation in terms of metacognitive strategy use and motivational factors. These studies use mostly person-centred approaches to identify profiles of students' motivational and metacognitive self-regulatory characteristics. Person-centred approaches, such as latent profile analysis, do not accommodate interaction effects in the same ways as conventional regression modelling. Nevertheless, the distinct subgroups/profiles of students' characteristics mimic higher-order interactions that would have been impossible to disentangle otherwise using regression modelling (D. Bauer & Shanahan, 2007; Lanza et al., 2010; Merz & Roesch, 2011). Therefore, person-centred evidence can be interpreted in terms of both heterogenous profiles of and complex interactions between motivational beliefs and metacognitive self-regulation.

Studies having deployed person-centred (i.e., latent profile/ cluster analyses) approaches indicate the possibility of encountering more than three subgroups of students'

motivational and metacognitive self-regulation. Yet, conclusive results cannot be reached since each study offers new insights. Research studies using school-aged student samples have also revealed various emerging profiles. For instance, a study revealed four profiles of motivational and metacognitive self-regulation characteristics ranging from unmotivated learners to maximal learners (Karlen, 2016). Another study explored profiles of motivation and metacognitive strategy use of second language learners and found four profiles of students that were characterised by varying scores on motivational and strategy variables (Chon & Shin, 2019).

In the same vein, studies with college/university samples have illustrated significant variation of emerging profiles. For instance, studies have indicated five (Broadbent & Fuller-Tyszkiewicz, 2018; Nelson et al., 2015) or four (Dörrenbächer & Perels, 2016) profiles. The emerging profiles included a mixture of different characteristics of motivation, metacognitive and cognitive self-regulation with some studies suggesting the existence of both positive and negative interactions. However, a research gap is that all the above studies did not examine the links between the profiles with students' native language attainment, but focused on specific grades in certain university/college samples. Finally, most studies with university samples had small-to-medium sample sizes, which may be underpowered for profile analyses (Nylund-Gibson & Choi, 2018).

There is also preceding evidence that profiled students' motivational (Korpershoek et al., 2015; Tóth-Király et al., 2022) and (meta-)cognitive self-regulatory strategies (Kwarikunda et al., 2022; Ning & Downing, 2015) separately. However, such profiling evidence is limiting since it does not permit study of how different aspects of academic motivation and metacognitive self-regulation interact in the prediction of language achievement. To this end, the present study sought to address this limitation by including both a range of motivational indicators and metacognitive self-regulation in the profiling to predict school language achievement.

What is interesting, though, is that both secondary school and university studies identified some profiles where students scored higher on motivation but lower on certain metacognitive or cognitive strategies. This suggests that the potential interactions between students' motivational beliefs and metacognitive self-regulation may be more complicated than initially thought, namely they may be negative. Since the MASRL model does not

specify the sign of the interactions (Efklides, 2011; Efklides et al., 2018), more research is needed on the complex interactions between motivational beliefs and metacognition to better understand the self-regulated learning processes at the general person-level.

### 5.1.3. School language achievement: A critical outcome

Language is such a necessary ingredient for human communication since humans' mental representations, learning, and cognition rely heavily on language (Gottlieb, 2016; Halliday, 1993). Young students live in a swiftly changing world where the demands to understand and produce a quantity and variety of written materials are increasing and becoming more complicated (OECD, 2019a). Given these new challenges that students face, students need to acquire new cognitive and metacognitive competencies in order to process linguistic inputs (OECD, 2019a). However, most of the studies profiling students' motivational and metacognitive self-regulation characteristics have not connected these profiles/ interactions with school first language (L1) attainment, which captures a range of linguistic skills (e.g., abstract writing, text comprehension, essay writing, reading literacy, etc.) that are taught in the secondary school in Greece (Law 21072b/C2). This is a significant gap in the literature that the present study seeks to address.

### 5.1.4. The nature of the Greek language subject and the educational system

The Greek language subject in the Greek secondary schools is usually taught by specialised language teachers that have completed four-years university education in linguistics/ philology. The educational system is centralised and all students at the same year-groups are taught using the same language textbooks (that are centrally provided) based on the common national curriculum (Katsantonis et al., 2023) for Greek modern language. The Greek modern language subject is taught between two and three hours per week in the junior high school (Gymnasium) (Ministry of Education, 2022) and two to four hours in senior high school (Lyceum) (Ministry of Education, 2020). According to official guidelines for teaching the Greek modern language, the main aims are to enhance the linguistic and communicative capabilities of students through reading and comprehending written and oral speech, the development of critical thinking, the understanding of grammatical phenomena, the recognition of text genres, and production of written texts in authentic communication frameworks (Ministry of Education, 2022). Given the above, students' school language achievement reflects to what extent students had acquired a

range of competencies. However, according to PISA 2018 findings, more than 25% of the Greek adolescent students (aged 15 years old) had achieved below the “minimum level of proficiency” that all students should achieve by the end of secondary education, as outlined in the United Nations Sustainable Development Goals (OECD, 2019b). Therefore, it is more crucial to conduct research in this low-performance setting to understand the reasons that drive students’ achievement and underachievement.

#### 5.1.5. The present study

It has become clear that most of reviewed studies were conducted in high-performance countries, with small-to-medium sample sizes, and using university/college student samples. A smaller proportion of extant studies utilised second-language learners. All these facts pose some theoretical and practical limitations in terms of developmental sensitivity and educational value. Hence, it is important to address these limitations by including a range of motivational beliefs (e.g., self-efficacy, mastery and performance goal orientations, intrinsic and extrinsic motivation) in the profiling of metacognitive self-regulation of secondary school students and to link these profiles with school language achievement. To address the potential issue of confounding, I also included a few socio-demographic variable as covariates based on preceding evidence. These covariates were the following. Firstly, gender was included as a covariate since gender differences have been noted in both motivation and metacognition (Katsantonis, 2020). Secondly, students’ socio-economic status (SES) was also included since it has been associated with achievement gaps (Sirin, 2005), but is seldomly included as a predictor of students’ motivational and metacognitive profiles. Thirdly, students’ age was also accounted for given that greater age has been associated with better metacognition (Weil et al., 2013) but lower academic motivation (Fredricks & Eccles, 2002). Finally, whether students spoke Greek at home (as a proxy of non-native language learners) with their families was also controlled since it has been found to influence students’ achievement (Van Laere et al., 2014). Overall, to guide this study, the following research questions and hypotheses were formulated:

RQ1: How do motivational and metacognitive characteristics co-occur in the same students? How are the interactions between motivational and metacognitive characteristics formed?

RQ2: How do different profiles of common motivational and metacognitive characteristics influence school language achievement?

RQ3: How are the covariates (socio-economic status, sex, age, and (main) language spoken at home) associated with the profiles of motivation and metacognitive self-regulation?

It is hypothesised that more than three profiles of students' motivational and metacognitive self-regulatory characteristics would emerge (H1). It is expected that one profile would include interactions between high motivation and high metacognitive self-regulation (H2), whilst another profile would include interactions between low motivation and low metacognitive self-regulation (H3). It is possible that another profile including a negative interaction would occur such as low motivation and high metacognitive self-regulation, or the reverse (H4). It is expected that the emergent interactions through the person-centred approach would be linked differentially with school language achievement (H5). Additionally, identifying as a male would be associated with membership to the less motivated and metacognitive self-regulation profiles (H6). Further, I hypothesised that students from higher SES backgrounds would be more motivated and display greater metacognitive self-regulation (H7). Given the ambiguity regarding the association of age (i.e., a proxy of developmental level) with motivation and metacognitive self-regulation profiles, I did not formulate a specific directional hypothesis but only assumed that an association would emerge (H8). Finally, it was expected that speaking Greek at home would be associated with greater likelihood of membership to the more motivated and metacognitively self-regulated profiles since native speakers would probably face less difficulties in the school language lesson (H9).

## 5.2. Method

### 5.2.1. Participants

The sample of the present study comprise 1,046 Greek secondary school students ( $M_{age} = 13.97$ ,  $SD = .80$ ) from 19 schools. The data collection took place between late 2022 and late April 2023. The sample consisted of 46.86% boys and 53.14% girls. Students come from a range of socio-economic backgrounds but overall were of average SES ( $M = 6.38$ ,  $SD = 1.6$ ). The majority of the students spoke Greek at home (94.42%), and were sampled from urban ( $N = 12$ ), semi-urban ( $N = 4$ ), and a few rural areas ( $N = 3$ ). The above demographics are aligned with population estimates according to national averages (Hellenic Statistical Authority, 2022). The present sample is situated within the developmental stage of adolescence, when significant biological (e.g., puberty, brain development), educational (e.g., transitions from

primary to secondary school), and relational (e.g., romantic relationships) changes occur (Katsantonis et al., 2022). Thus, the present sample's developmental characteristics differ from those of previous studies with college students.

### 5.2.2. Measures

Several scales from the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich et al., 1991; Pintrich & Groot, 1990) were deemed appropriate for adolescents aged ~14 years old and were administered. Additionally, the MSLQ has been utilised in a plethora of studies, translated to different languages (including Greek- (Andreou & Metallidou, 2004; Metallidou & Vlachou, 2007, 2010), and administered to various populations in different educational and cultural contexts (Duncan & McKeachie, 2005). All MSLQ items are scored using a 7-point rating scale ranging from 1 "not at all true of me" to 7 "very true of me" (Pintrich & Groot, 1990). The question prompts were adapted to refer to the modern Greek language lessons that students are taught as part of the national curriculum. Item wordings and coding decisions are presented in supplementary materials (Appendix D).

#### Self-efficacy

The scale comprised 9 items (see Table in S1 Table) measuring perceptions of competence and performance in the language class (Pintrich & Groot, 1990). Reliability coefficient indicated exceptional reliability, Cronbach's  $\alpha=.91$ .

#### Mastery and performance goal orientations

Two scales were tapping into mastery and performance goals. The *mastery goal orientation* scale comprises 4 items measuring students' perceptions of the reasons why they engage with the lesson, such as developing competence, curiosity, and challenge (Pintrich et al., 1991). The reliability coefficient indicated adequate reliability, Cronbach's  $\alpha=.68$ . The *performance goal orientation* scale consists of 4 items that measure students' perceptions of engagement in the modern Greek language lesson for reasons of displaying competence, rewards, and outperforming others (Pintrich et al., 1991). The reliability coefficient indicated good reliability, Cronbach's  $\alpha=.78$ .

#### Intrinsic motivation and extrinsic motives

The 6-item long task value scale was split into two separate scores because a confirmatory factor analysis (CFA) rejected the unidimensional structure. However, a CFA (see results section) confirmed the two-factor structure. Two items that described interest and liking the topics and content of the class (i.e., emotional aspect) were assumed to reflect intrinsic motivation. Cronbach's  $\alpha=.82$  indicated good reliability for the intrinsic motivation scale. The other four items that described utility, valuing, and importance of the language class content were assumed to capture the extrinsic motivation aspect, in line with self-determination theory (Ryan & Deci, 2020). Cronbach's was  $\alpha=.86$ , demonstrating a good level of reliability.

### **Metacognitive self-regulation**

The metacognitive component covers the control and self-regulatory part of metacognition (Tock & Moxley, 2017). Metacognitive self-regulatory strategies in this measure include planning, monitoring, and regulating (Duncan & McKeachie, 2005). Planning is operationalised as goal-setting, whilst monitoring is measured using indicators of tracking one's task-/goal-relevant attention (Pintrich et al., 1991). Finally, correcting one's cognitive activities is used as an index of metacognitive control (Pintrich et al., 1991). From the original nine items comprising the metacognitive self-regulation, three loaded on the factor very weakly even after reverse-scoring them due to negative content and were, thus, dropped from the scale. Cronbach's coefficient of reliability indicated that the scale was reliable,  $\alpha=.77$ .

### **Modern Greek language achievement**

Grades in modern Greek language classes were reported by students. Studies have shown that self-reported grades are very reliable (Caprara et al., 2008; Kuncel et al., 2005; Sticca et al., 2017). The Greek grading system in secondary education is numerical and ranges from one to twenty. Thus, grades in modern Greek language class potentially ranging from one to twenty were utilised.

### **Covariates**

A few demographics were collected as covariates based on preceding research suggesting appreciable associations between these covariates, motivation, and metacognition.

*Gender.* A binary variable was used to code students' gender as male versus female.

*Socio-economic status (SES).* In this study, the families' SES was measured using the youth version of the *MacArthur* scale (Goodman et al., 2001), which is a ladder where students mark where they think their families are standing in the society. The possible values can range from 1 "lowest SES" to 10 "highest SES".

*Age.* Students' age was coded using an ordinal variable ranging from 13 to 16. Age was controlled .

*Language spoken at home.* A binary variable (1=yes, 0=no) was used to code whether students spoke Greek with their family at home.

*Current school grade.* Students' current school grade was measured using an ordinal variable reflecting which grade students were studying in and was ranging from 0 "A Gymnasium" to 3 "A Lyceum". I did not include this variable in the main analyses as a control variable because of overlap with students' age and due to very possible confounding.

### 5.2.3. Statistical analyses

Common method bias was assessed with an exploratory factor analysis (EFA) (Fuller et al., 2016) at the item-level using the minimum residual estimation (MINRES) method based on parallel analysis for latent factor extraction. A general factor accounting for more than 50% of the variance would indicate some common method bias (F. Kock et al., 2021). Additionally, a collinearity test was deployed at the composite level to identify potential common method bias, whereby a variance inflation factor (VIF) greater than 3.3 would indicate common method bias (N. Kock, 2017).

Confirmatory factor analyses (CFA) were estimated per scale to explore the internal structure validity of the scales (T. A. Brown, 2015). A weighted composite score was derived per scale by multiplying each item by its factor loading (Finch et al., 2016). Afterwards, the six weighted composite variables were z-scored ( $M=0$ ,  $SD=1$ ) so that they were placed on the same metric and were more comparable (Cooper, 2019). Latent profile analyses (LPA) were estimated based on the z-scored variables. LPA is a probability model that assigns participants into  $k$  latent profiles that share similar characteristics on the measures (Ferguson et al., 2020). The LPA model, unlike cluster analysis, allows for a mathematical

evaluation of how well each LPA solution fits the data and accounts for both measurement and classification error (Nylund-Gibson & Choi, 2018).

To examine the links of profile memberships (including the interactions) with school language achievement, the manual BCH method was deployed since it does not shift the number of latent profiles by including more indicators and can, additionally, accommodate relevant covariates (Asparouhov & Muthen, 2021; Nylund-Gibson et al., 2019). Given a fraction of missing data on covariates, a multiple imputation was conducted in *Mplus* (Asparouhov & Muthen, 2022) using all the variables above since full-information maximum likelihood is not available with the BCH method (Asparouhov & Muthen, 2021). The full conceptual model is presented in Figure 20.

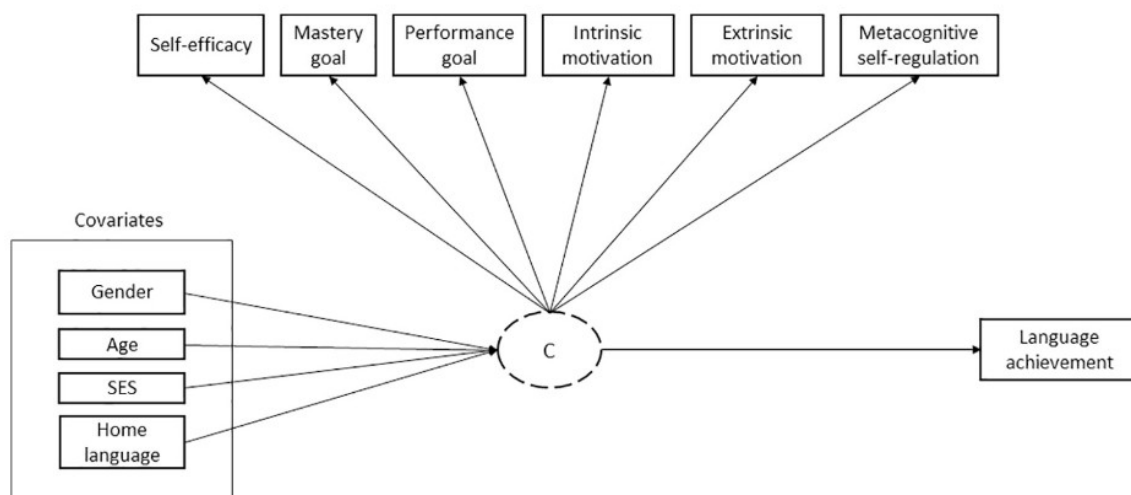


Figure 20. Categorical latent variable predicting language achievement conditionally on covariates © Katsantonis & McLellan (2023)

The small sample size at the school-level ( $N=19$ ) did not justify multilevel modelling or cluster-robust standard errors since the estimated parameters exceeded the number of clusters (McNeish & Stapleton, 2016b). However, intra-class correlation coefficients (ICC) were derived from variance components (no-predictor random-intercept) models to explore the extent to which nesting of students within schools had to be taken into account using alternative approaches. An ICC below .05 would indicate that a multilevel modelling will have few benefits and be unreliable to estimate (Dyer et al., 2005). In case of an ICC greater

than .05, a fixed-effects estimator was chosen to adjust the standard errors and account for unobserved school-level covariates (McNeish & Kelley, 2019; McNeish & Stapleton, 2016a). This was achieved by regressing the achievement and the latent categorical variables on 18 dummy variables (19 schools minus 1).

To evaluate how well a proposed CFA model represents the data, the conventional fit indices were utilised. Specifically, CFI and TLI values close to/above .95 along with RMSEA and SRMR values below .06 and .08, respectively, were considered indicators of exceptional fit of the model to the data (Hu & Bentler, 1999). Factor score determinacy (FDET), defined as the correlation between the true and estimated factor scores, was also calculated. FDET is an indicator of the uncertainty of the latent factor measurement (Rigdon et al., 2019) with values close to 1 indicating less uncertainty and better measurement (L. K. Muthén & Muthén, 2017).

For profile enumeration in LPA, multiple fit indices were considered along with the practical interpretability of the profile solutions (J. Bauer, 2022; Nylund et al., 2007). The Bayesian (BIC) and the sample-adjusted Bayesian information criteria (a-BIC) were evaluated along with the Vuong-Lo-Mendell-Rubin (VLMR), the Lo-Mendell-Rubin (LMR), and bootstrapped (BLRT) likelihood ratio tests that compare the model with the  $n-1$  profiles with the model with  $n$  profiles. It is known that the information criteria can keep decreasing with additional profile solutions (Nylund-Gibson & Choi, 2018). Similarly, the likelihood ratio tests can reach statistical significance in the presence of a large sample size (J. Bauer, 2022). Therefore, the 'elbow' plot of the information criteria values can be used to identify the point of diminishing returns similar to a variance explained measure as additional profiles are extracted (Ferguson et al., 2020; Masyn, 2013). Additionally, the classification quality was also considered, whereby entropy (E) values above .8 are preferable (Ferguson et al., 2020).

All main statistical analyses were performed using the *Mplus* 8.7 software (L. K. Muthén & Muthén, 2017), whilst preliminary data management was performed using Stata 16 (StataCorp., 2021). Since the BCH method does not provide effect sizes, Cohen's  $d$  was calculated using Lakens' (2013) calculator, whereby values equal to .2 are small, values equal to .5 are medium, and values equal to/above .8 are large (J. Cohen, 1988). Partial eta

squared ( $\eta^2$ ) effect sizes were also calculated for between-profile differences, whereby values equal to .01 are small, .06 are medium, and .14 are large (J. Cohen, 1988).

#### **5.2.4. Procedure**

This study's data collection protocols have received ethical approval by the Psychology and Education Research Ethics committee at the Faculty of Education, University of Cambridge, UK (29/7/2022). Parents/legal guardians of the students provided written informed consent and the students assented to participate. The questionnaires were administered by the lead researcher in schools. Permission to conduct the research in schools was granted by the Greek Ministry of Education (REF: 145640/ $\Delta$ 2/23-11-2022).

### **5.3. Results**

#### **5.3.1. Preliminary analyses**

##### **5.3.1.1. Descriptive statistics and latent partial bivariate correlations**

Descriptive statistics and correlations are presented in Table 8. As seen in Table 8, students simultaneously hold multiple motivational beliefs since the correlations were all positive between the motivational beliefs. The intra-class correlation coefficients (ICC) revealed that a multilevel modelling was not justified given the small between-school heterogeneity in motivational beliefs and metacognitive self-regulation. The only exception to this was school language achievement, whereby 15% of school language achievement was attributable to school-level differences.

**Table 8. Descriptive statistics and latent partial bivariate correlations between covariates and outcomes of Study 2**

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. GENDER	1											
2. LANG	-.02	1										
3. SES	-.02	-.01	1									
4. AGE	.00	-.04	-.09*	1								
5. CLASS	-.07*	-.02	-.09*	.74***	1							
6. SELF	-.14***	.16***	.21***	-.10***	-.08**	1						
7. MASTERY	-.17***	.13***	.10***	-.06	-.04	.54***	1					
8. PERFORM	-.02	.06	.08*	-.15***	-.14***	.28***	.22***	1				
9. INT	-.14***	.09**	.08*	-.13***	-.10***	.47***	.54***	.25***	1			
10. EXT	-.20***	.12***	.08*	-.16***	-.13***	.57***	.61***	.32***	.78***	1		
11. MCOG	-.16***	.11***	.10***	-.14***	-.14***	.54***	.52***	.31***	.53***	.62***	1	
12. GRADE	-.18***	.06*	.10***	-.09***	-.08**	.54***	.26***	.06	.08***	.28***	.35***	1
Descriptive statistics												
<i>Min-Max</i>	0-1	0-1	1-10	12-16	0-3	6.52-	2.24-	2.56-	1.67-	3.12-	3.55-	2-20

						45.63	15.69	17.89	11.69	21.86	24.84	
% Max	46.86	94.42	4.4	1.25	1.63	.39	1.44	6.41	5.9	5.23	4.23	5.14
M (SD)	-	-	6.38 (1.60)	13.97 (.80)	1.45 (.69)	32.03 (7.61)	10.75 (2.80)	13.10 (3.43)	7.22 (2.73)	14.76 (4.56)	15.09 (4.82)	15.97 (2.86)
ICC	-	-	-	-	-	.02	.02	.04	.03	.04	.03	.15

*Note:* GENDER: male; LANG: whether student speaks Greek at home; SES: MacArthur socio-economic status scale; AGE: The numerical age of the students; CLASS: The school grade currently studying in; SELF: Academic self-efficacy in language lesson; MASTERY: Mastery goal orientation; PERFORM: Performance goal orientation; INT: Intrinsic motivation (interest and enjoyment); EXT: Extrinsic motivation (utility and value); MCOG: Metacognitive self-regulation; GRADE: School language lesson grade; ICC: Intra-class correlation coefficient; \*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$

### 5.3.1.2. Outliers and missing data analysis

Multivariate outliers were examined through the LPA analysis using the influence statistic in Mplus. All influence values were below 1 ranging between  $.89 > INF > .001$ . Thus, no potential outliers were identified for the LPA analysis (Tabachnick & Fidell, 2012). To explore the missing data mechanism, missing data patterns were subjected to Little's MCAR (missing completely at random test) test. Little's MCAR reached statistical significance,  $MCAR \chi^2(1009) = 1292.123, p < .001$ . Thus, the missing values were not missing completely at random. Next, I tested whether the hypothesis of missing at random data conditionally on covariates (i.e., sex, class, age, SES, and home language). The CDF  $\chi^2(5304) = 2419.121, p > .05$ , indicated that the missing data patterns were related to covariates. Hence, I could analyse the data using full-information maximum likelihood estimation.

### 5.3.1.3. Common method bias assessment

The EFA showed that the largest unrotated factor explained 33.2% of the variance, indicating no common method bias. The mean VIF was 2.08 with range of 1.19 to 3.37, confirming the absence of common method bias as well as the absence of multicollinearity. A one-factor CFA also confirmed the absence of common method bias:  $CFI = .701, TLI = .679, RMSEA = .085, SRMR = .082$ .

### 5.3.1.4. Construct validity testing

As seen in Table 9, CFA indicated good construct validity for the scales following some minor modifications by introducing residual correlations according to the modification indices.

**Table 9. Fit indices for internal structure validity analyses (CFA) of Study 2 scales**

Scale	$\chi^2(df)$	CFI	TLI	RMSEA	SRMR	FDET
Self-efficacy	123.768 (27)***	.960	.947	.059	.032	.956
Mastery goal orientation	.820 (1)	1.00	1.00	.000	.006	.842
Performance goal	6.917 (2)*	.991	.973	.049	.016	.867

orientation						
Intrinsic & Extrinsic motivation <sup>†</sup>	44.285 (8)***	.980	.962	.066	.023	.936 <sup>a</sup> ; .948 <sup>b</sup>
Metacognitive self-regulation	25.642 (8) **	.984	.970	.046	.021	.882

Note: † Two-factor model for intrinsic and extrinsic motivation; FDET: Factor score determinacy; a: FDET determinacy for intrinsic motivation; b: FDET

determinacy for extrinsic motivation; \*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$ ;

The parameter estimates of the CFA models are presented in the Tables 10, 11, 12, 13, and 14.

**Table 10. Confirmatory factor analysis of the mastery goal orientation scale**

Item	Factor Loading
Item 1	.502***
Item 2	.490***
Item 3	.793***
Item 4	.457***
Inter-item residual correlation	Coefficient
Item 2 WITH Item 1	.365***

\*\*\* $p < .001$

**Table 11. Confirmatory factor analysis of the performance goal orientation scale**

Item	Factor Loading
Item 1	.713***
Item 2	.718***
Item 3	.565***
Item 4	.560***

\*\*\* $p < .001$

**Table 12. Confirmatory factor analysis of the self-efficacy in school language lesson scale**

Item	Factor Loading
Item 1	.648***
Item 2	.654***
Item 3	.789***
Item 4	.794***
Item 5	.703***
Item 6	.777***
Item 7	.783***
Item 8	.716***
Item 9	.654***

\*\*\* $p < .001$

**Table 13. Confirmatory factor analysis of the intrinsic and extrinsic motivation scale (two-factor solution)**

Item	Factor Loading
Intrinsic Factor	
Item 1	.867***
Item 2	.803***
Extrinsic Factor	
Item 1	.723***
Item 2	.769***
Item 3	.833***
Item 4	.798***

Latent Factor Correlation	Coefficient
	.914***

\*\*\* $p < .001$

**Table 14. Confirmatory factor analysis of the metacognitive self-regulation scale**

Item	Factor Loading
Item 1	.737***
Item 2	.606***
Item 3	.615***
Item 4	.657***
Item 5	.441***
Item 6	.493***

Inter-item residual correlation	Coefficient
Item 4 WITH Item 6	.306***

\*\*\* $p < .001$

### 5.3.2. Exploring complex interactions between motivational beliefs and metacognitive self-regulation: A latent profile analysis

To begin with the analyses, a likelihood ratio test was calculated based on the two-profile solution to estimate whether the latent profile indicator variances should be freely estimated across latent profiles or constrained to equal. The  $LRT(6) = 176.99$ ,  $p = .001$ , indicated that the latent profile indicators' variances should be freely estimated across profiles. Hence, the LPA models were estimated with unequal indicator variances and means. The fit indices for the LPA modelling are presented in Table 15.

**Table 15. Fit indices for latent profile analyses (unequal variances)**

Np	Log-Lik	BIC	a-BIC	E	VLMR <i>p</i>	LMR <i>p</i>	BLRT <i>p</i>
2	-7750.005	15632.112	15571.765	.824	<.001	<.001	<.001
2 <sup>A</sup>	-7656.136	15486.091	15406.688	.848	<.001	<.001	<.001
<b>3<sup>A</sup></b>	<b>-7341.014</b>	<b>14946.232</b>	<b>14825.539</b>	<b>.827</b>	<b>&lt;.01</b>	<b>&lt;.01</b>	<b>&lt;.001</b>
4 <sup>A</sup>	-7212.588	14779.765	14617.782	.812	>.05	>.05	<.001
5 <sup>A</sup>	-7072.721	14590.416	14387.143	.854	<.01	<.01	<.001

A: Unequal indicator variances across profiles; STARTS=500 125 10; Np: Number of extracted profiles; Log-Lik: Loglikelihood; BIC: Bayesian Information

Criterion; a-BIC: Sample-adjusted BIC; E: Entropy; VLMR: Vuong-Lo-Mendell-Rubin LRT test; LMR: Lo-Mendell-Rubin LRT test; BLRT: Bootstrapped LRT

From the (a-)BIC values in Table 15, it became clear that more than five profiles should be extracted. However, the VLMR and LMR LRT were in favour of the three-profile solution since the four-profile solution did not differ significantly from the three-profile solution. Given the inconsistent fit indices, the (a-)BIC values were plotted as shown in Figure 21. The 'elbow' plot indicated that the point of diminishing returns is reached at three profiles. Further profiles were also extracted but they did not represent theoretically meaningful solutions since they simply splintered the already well-defined three-profile solution. Therefore, the three-profile solution was retained.

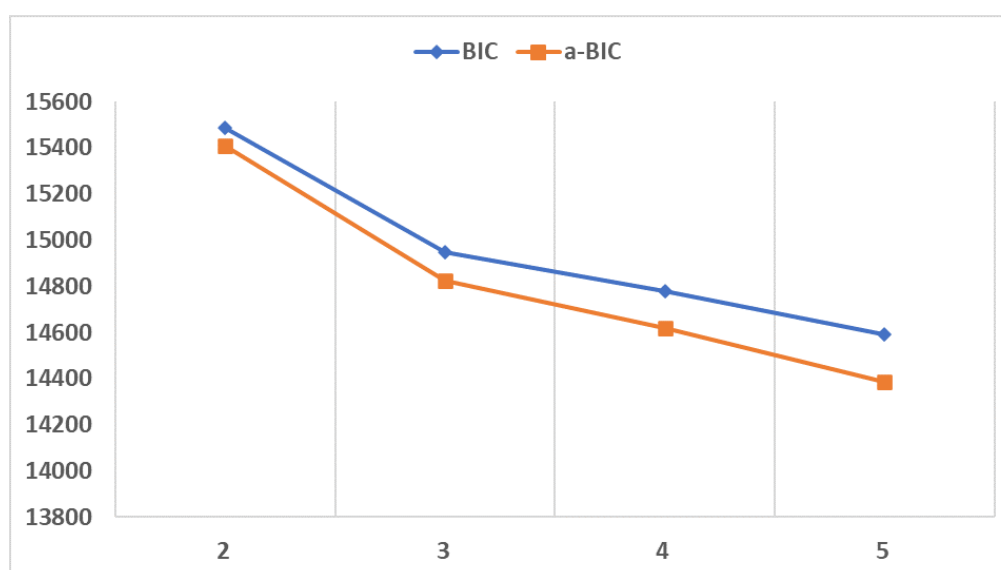


Figure 21. 'Elbow' plot of BIC and a-BIC values for LPA models with 2 to 5 profiles. ©

Katsantonis & McLellan (2023)

LPA latent indicator means were plotted (Figure 22) to understand how the variables interacted within and across profiles. It appeared that motivational beliefs went hand-in-hand with metacognitive self-regulation. The analysis showed that the students *within* each profile had similar levels of motivation and metacognitive self-regulation, whilst profiles where students scored high on motivation but low on metacognitive self-regulation, or the reverse, did not emerge. Thus, it was assumed that the sixth-order interaction between self-efficacy beliefs, mastery and performance goal orientations, intrinsic and extrinsic motivation, and metacognitive self-regulation was positive.

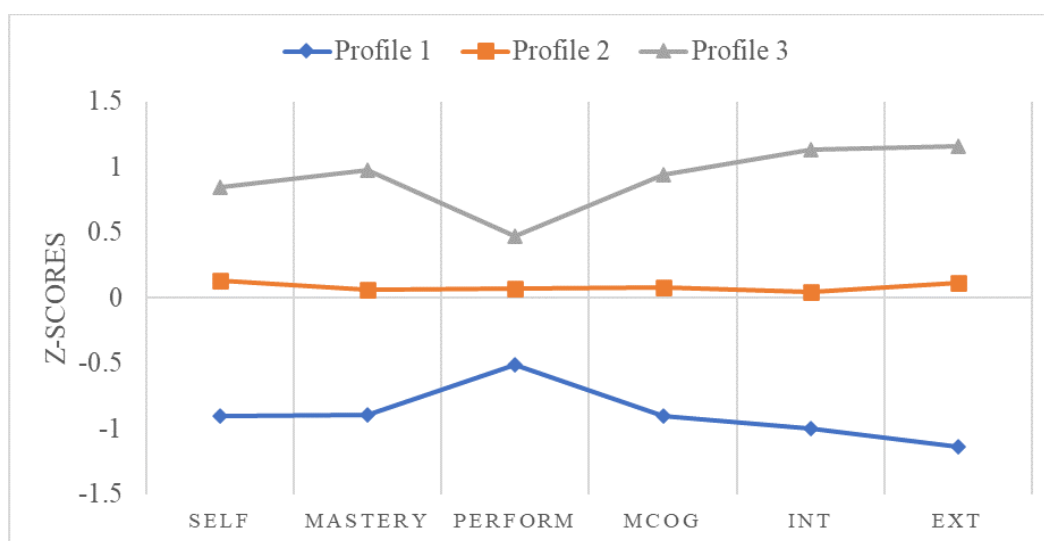


Figure 22. Plot of LPA indicator means; Profile 1: Minimal MMSR (28.5%); Profile 2: Adequate MMSR (48.2%); Profile 3: Exceptional MMSR (23.3%). © Katsantonis & McLellan (2023)

A significant proportion (28.5%) of the students belonged to profile 1 that was characterised by extremely low scores on motivational beliefs and metacognitive self-regulation, and was, thus, called “*minimally motivated and metacognitively self-regulated students*” (minimal MMSR). Consequently, these students seemed to have extremely low capability to self-regulate their learning. Only 23.3% of the students were scoring nearly 1 SD above the mean of the sample and were named “*exceptionally motivated and metacognitively self-regulated students*” (exceptional MMSR). These students were

expected to be extremely proficient in self-regulating their learning. Finally, the majority (48.2%) of the students appeared to score on the mean of the motivational beliefs and the metacognitive self-regulation scales and were labelled “*adequately motivated and metacognitively self-regulated students*” (adequate MMSR). In Table 4, the indicator means and standard deviations per profile are presented and compared to gain deeper understanding of how the interactions function. As seen in Table 18, the differences in motivational variables and metacognitive self-regulation were very large between profiles.

**Table 16. Motivational and metacognitive self-regulation indicator means and standard deviations across profiles**

Indicator	Profile 1, M (SD)	Profile 2, M (SD)	Profile 3, M (SD)	Brown- Forsythe F	Partial $\eta^2$
Self-efficacy	-0.90 (.91)	.13 (.76)	.84 (.55)	376.74***	.42
Mastery goal	-0.90 (.93)	.06 (.71)	.98 (.48)	478.26***	.47
Performance goal	-0.51 (1.05)	.07 (.92)	.47 (.81)	73.34***	.13
Intrinsic motivation	-1.00 (.73)	.05 (.68)	1.14 (.40)	863.56***	.60
Extrinsic motivation	-1.14 (.69)	.11 (.55)	1.16 (.31)	1326.21***	.71
Metacognitive self- regulation	-.91 (.80)	.08 (.77)	.94 (.60)	462.67***	.46

Note: All indicator means reached statistical significance at least at  $p < .05$ . The assumption of homogeneity of variances was rejected according to Levene's test.

M: Mean; SD: Standard deviation; Profile 1: Minimal MMSR; Profile 2: Adequate MMSR; Profile 3: Exceptional MMSR; \*\*\* $p < .001$

### 5.3.3. Variation in school language achievement across profiles

Next, the manual BCH method was deployed to explore whether profile membership was predicting achievement in language lessons adjusting for covariates. Given that ICC revealed 15% of the variance in school language achievement was explained by school-level factors, a fixed-effects estimation was implemented.

In the minimal MMSR profile, achievement was the lowest,  $M=13.02$ ,  $SD=2.89$ ,  $p < .001$ . The language achievement in the adequate MMSR profile 2 was nearly two units higher with  $M=16.05$ ,  $SD=2.18$ ,  $p < .001$ , whereas mean achievement was the highest

$M=18.01$ ,  $SD=2.13$ ,  $p<.001$ , in the exceptional MMSR profile 3. Adjusting for covariates (Table 17), the mean language achievement between profiles 2 and 3 differed significantly with a large effect size,  $Z=-3.08$ ,  $p=.002$ , Cohen's  $d=.90$ . The mean achievement differed even more between profiles 1 and 2,  $Z=-2.69$ ,  $p=.007$ , Cohen's  $d=1.23$ . Finally, the effect size of the mean achievement difference between profiles 1 and 3 was even larger,  $Z=-4.79$ ,  $p=.000$ , Cohen's  $d=1.94$ .

**Table 17. School language achievement differences across profiles and latent multinomial regressions predicting profile membership (fixed-effects estimation)**

Achievement comparisons across profiles				
Profile contrast	$\Delta\mu$	$Z$	$p$ -value	95% CI
P1-P2	-3.03	-2.69	.007	-5.23, -.82
P1-P3	-4.99	-4.79	.000	-7.03, -2.95
P2-P3	-1.96	-3.08	.002	-3.20, -.71
Latent Multinomial Regressions				
	$OR$	$Z$	$p$ -value	95% CI
Profile 1				
Gender (male)	3.12	5.29	.000	2.05, 4.76
Age	1.45	2.35	.019	1.06, 1.99
SES	.80	-3.19	.001	.70, .92
Language at home (Greek)	.22	-2.95	.003	.08, .60
Profile 2				
Gender (male)	1.65	2.56	.010	1.12, 2.41
Age	1.18	1.14	.254	.89, 1.58
SES	.91	-1.51	.130	.81, 1.03
Language at home	.55	-1.07	.282	.18, 1.63

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(Greek)

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Note: Profile 3 (Exceptional MMSR) was the reference profile; all regression coefficients represent differences in comparison to profile 3. P1: Minimal MMSR; P2: Adequate MMSR; P3: Exceptional MMSR;  $\Delta\mu$ : Mean difference; OR: Odds ratio; 95% CI corresponds to the 95% confidence interval for the odds ratio and the mean differences, respectively.

Using the manual BCH method, multinomial logistic regressions were also estimated to explore the predictive effects of covariates on profile memberships. The BCH method revealed that being male predicted greater odds of membership in the minimal MMSR profile 1 (OR=3.12, 95% CI 2.05, 4.76) and in the adequate MMSR profile 2 (OR=1.65, 95% CI 1.12, 2.41) compared to the exceptional MMSR profile. Being older was related to greater odds of belonging to minimal MMSR profile 1 (OR=1.45, 95% CI 1.06, 1.99) compared to the exceptional MMSR profile, confirming the decline in academic motivation in adolescence. Coming from a household with higher SES was related to lower likelihood of being in the minimal MMSR profile 1 (OR=.80, 95% CI=.70, .92). Speaking Greek language at home was associated only with lower odds of belonging to the minimal MMSR profile 1 (OR=.22, 95% CI .08, .60).

## 5.4. Discussion

This study aimed to investigate the higher-order interactions between students' language class motivation and metacognitive self-regulation guided by the MASRL model. Additionally, the study aimed to explore how these interactions were linked with students' language class achievement in the Greek low-performance context. To achieve these objectives, LPA was used to mimic those higher-order interactions and link profile membership with school language class achievement. Hence, the present study contributes to the existing literature in multiple ways that will be described below.

### 5.4.1. Profiles of motivational beliefs and metacognitive self-regulation: Exploring the form of the interaction hypothesis

The current LPA analyses revealed that Greek students' motivated metacognitive self-regulation exhibited not only quantitative but also qualitative individual differences. Surprisingly, the number of subgroups of students with similar motivational and metacognitive characteristics was smaller than initially hypothesised. Thus, H1 was rejected. In other words, although past studies indicated four or more emerging profiles (Broadbent

& Fuller-Tyszkiewicz, 2018; Dörrenbächer & Perels, 2016; Nelson et al., 2015; Pintrich & García, 1993), the current evidence suggests the existence of only three well-defined profiles of motivated metacognitive self-regulation.

In greater detail, the present findings indicated three profiles that contained students who exhibited minimal, adequate, and exceptional scores on all indicators, respectively. The results revealed that 28.5% of the students had minimal scores in motivation and metacognitive self-regulation, whilst only 23.3% had exceptional scores on motivation and metacognitive self-regulation in school language lesson. 48.2% of the students had adequate scores across all variables. These findings are indicative of sixth-order interactions that occur in the same students (D. Bauer & Shanahan, 2007; Lanza et al., 2010). Across the spectrum of different possible values of motivation and metacognitive self-regulation in the school language lesson, the interactions between self-efficacy, mastery and performance goal orientations, intrinsic and extrinsic motivation, and metacognitive self-regulation were synergistic, meaning that greater motivational beliefs were associated with greater planning, monitoring, and regulating cognitive processes in the language lesson.

Regarding the shape of the profiles, the initial hypotheses were that I would identify a profile including the interaction between high motivation and high metacognitive self-regulation, which was confirmed (H2). Another hypothesis was that a profile would emerge including low motivation and low metacognitive self-regulation, which was also confirmed (H3). Surprisingly, a profile including negative interaction between academic motivation and metacognitive self-regulation did not emerge. Thus, H4 was rejected. This finding contradicts preceding evidence since the reviewed studies demonstrated that emerging profiles could comprise different levels of motivational beliefs and metacognitive strategies. For example, a study (Karlen, 2016) found a profile of students whose motivational beliefs were low but their metacognitive knowledge was high. Similarly, another study (Nelson et al., 2015) reported a profile of students with moderate scores on metacognitive strategies but low scores on motivational beliefs. Another study presented a profile with low self-regulation but high motivation (Dörrenbächer & Perels, 2016). An argument presented in some preceding studies (Karlen, 2016) is that low levels of metacognitive self-regulation

may be compensated by high motivation. However, the present study did not find any support for that argument.

It may be possible that profiles containing students with incompatible levels of motivation and metacognitive self-regulation or knowledge may indicate methodological differences such as the use of scales with different anchoring points which could induce variation in the sample variance of the measures, resulting, thus, in level-specific differences. Additionally, it is noted that profiles of students' motivation and metacognitive self-regulation is dynamic and may exhibit significant differences across academic subjects (Nelson et al., 2015) and developmental stages (e.g., adolescence vs. emerging adulthood) since different measurements and cognitive capabilities (Hirosawa & Oga-Baldwin, 2018) could explain the inconclusive results across studies.

Additionally, this finding answers an important question since the MASRL model, which illustrates the potential for interactions between motivation and metacognition, does not specifically set what would be the directional nature of these interactions (Efklides, 2011; Efklides et al., 2018). Indeed, MASRL outlines scenarios where the interaction between motivation self-beliefs, affect, and metacognition can be either positive or negative. An example of such a negative scenario would be a student that feels good about a school subject, has high self-efficacy that she can accomplish the task in the subject, and has a mastery- and performance-approach goal but is metacognitively inaccurate in judging the demands of a task in this subject (e.g., a test) and, thus, overestimates her capability. Nevertheless, the current findings urge us to reconsider how these particular interactions between motivational beliefs and metacognitive self-regulation should be theoretically modelled at the generic person-level since no such negative interactions emerged in this large sample of adolescent students. This may be specifically tied to the nature of the school language subject and the developmental period under study here but it, nevertheless, needs further research.

#### **5.4.2. Linking higher-order interactions between motivation and metacognition with school language achievement**

Some person-centred studies have explored the effects of the interactive effects on students' academic achievement. However, these studies focused on university/college

course grades (Broadbent & Fuller-Tyszkiewicz, 2018; Dörrenbächer & Perels, 2016; W. Hong et al., 2020), performance in second language (Chon & Shin, 2019), or mathematics (Cleary et al., 2021). Nevertheless, it is contended that it is also important to address the issue of how these interactions are predictive of school language achievement, especially since language-related competencies, such as reading literacy, writing, comprehension, are increasingly important for society but many adolescents lag behind in their acquisition (Council of European Union, 2018). Additionally, especially in the Greek context, language achievement in adolescence has been found to be declining sharply across the years (OECD, 2016a, 2019b).

Hence, to address this important question of whether the interactions between motivational beliefs and metacognitive self-regulation were predictive of language achievement, students' school language academic achievement was regressed on the latent categorical variable, adjusting for relevant covariates. The results indicated that those students with the lowest motivation and metacognitive self-regulation were the worst performing, whilst students with high motivation and metacognitive self-regulation were the most successful in school language courses. Although these findings do not indicate causality, they confirm, in line with theoretical evidence (Zimmerman et al., 2017), that students need a high level of academic motivation to become highly metacognitively self-regulators. However, it remains to be seen whether motivation can compensate for failure in metacognitive self-regulation and how this may be linked with academic achievement.

#### **5.4.3. Covariate effects on motivational and metacognitive self-regulation profiles**

In addition to the above, I accounted for the potential associations between a few control variables and motivational and metacognitive self-regulation profiles. The results of multinomial regressions revealed statistically significant gender differences in adolescent students' motivational and metacognitive profiles, with male students having a greater probability of membership in the minimal and sufficient profiles. Thus, H6 was confirmed. Preceding person-centred studies did not account for students' socio-economic (SES) background (Cleary et al., 2021; Karlen, 2016; Nelson et al., 2015), I included this variable since it has been connected with achievement gaps (Sirin, 2005). The findings indicated that coming from a higher SES household was associated with lower likelihood of being less

motivated and metacognitively self-regulated, confirming, thus, the seventh hypothesis (H7).

Although greater age has been associated with a decline in academic motivation (Gottfried et al., 2007; Wigfield et al., 2015), but an increase in the capability for metacognitive capabilities (Weil et al., 2013), I did not formulate clear theoretical assumptions given that ambiguity of the association between age and motivational and metacognitive profiles. Despite that, the regression results illustrated that being older was predictive only of greater likelihood of membership in the minimal motivation and metacognitive self-regulation profile. This confirmed my hypothesis suggesting that an association would emerge (H8). The observed negative association appears to be bilateral since the bivariate correlations suggested that both motivational variables and metacognitive self-regulation decreased with greater age. This may suggest that older students in this sample might be more careless and may not deploy maintain a sufficient level of metacognitive self-regulation in school language class, which may explain why there is a large percentage of low-performing students in PISA studies. Finally, students speaking Greek at home with their families had lower chances of being less motivated and metacognitively self-regulated. This suggests that speaking the school's official language at home has a protective effect against becoming less motivated and metacognitively self-regulated, confirming, thus, my ninth hypothesis.

#### **5.4.4. Strengths and limitations**

At this point, it is critical to reflect on some important strengths and limitations of this study. The large sample size, the low-performance context, the probability-based LPA, and the developmental stage of the participants can be considered amongst the strengths of this study. However, it ought to be noted that the sampling design is a convenience one and may not represent the whole Greek student population. Additionally, further measures indicative of self-regulated learning, such as cognitive strategies or task anxiety, were not included in this study, which limits the extent of the generalisations with respect to students' self-regulated learning. Finally, the self-reported nature of the measures might have been influenced by social desirability.

#### **5.4.5. Policy, practice, and theoretical implications**

In line with the current findings, teachers should facilitate the development of students' motivational beliefs, values about school language achievement, and metacognitive self-regulatory strategies. Given the significant proportion of students with minimal motivation and metacognitive self-regulation, emphasis should be placed on the identification and targeted educational intervention for those students. Due to the low academic performance educational system (Dominguez-Gil et al., 2022), systematic metacognitive strategy teaching and enhancement of students' language motivation are recommended to be integrated in the national curriculum in order to raise students' school language achievement. Particular emphasis should be placed on maintaining male students' motivation and metacognitive self-regulation because I found that male students had greater chances of belonging to the minimal MMSR profile. From an educational perspective, I also suggest providing individualised assistance to students from low-SES backgrounds and those who do not speak Greek at home to prevent them from becoming unmotivated, metacognitively unregulated, and, subsequently, low-performers.

From a theoretical viewpoint, the present study contributes to existing social-cognitive models of self-regulated learning (Efklides, 2011; Zimmerman, 2008) that typically do not explicate what would be the consequences of a failure either in metacognitive self-regulation or self-motivation for academic achievement. That is, the current study examined through a person-centred perspective whether low functioning in either metacognitive self-regulation or motivation could be compensated by higher functioning in the other domain. The results suggest that current self-regulated learning models should clearly explicate that students' motivation and metacognitive self-regulation are synergistically interacting across all levels of achievement. Additionally, the present findings challenge existing knowledge by suggesting that there is a limited number of subgroups of students with individual differences in motivation and metacognitive self-regulation.

**Chapter 6. Study 3- Students' voices: A qualitative study on  
contextual, motivational, and self-regulatory factors  
underpinning language achievement**

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## Abstract

A lack of qualitative studies examining adolescent students' voices regarding the contextual, relational, and self-regulatory factors that drive their language achievement has been observed. Therefore, the present study aimed to address this issue. Sixteen face-to-face semi-structured interviews were conducted with secondary school students in Greece to document and analyse their perceptions of the factors that influence language achievement. The study was guided by social-cognitive theory and models of self-regulated learning. Computer-assisted thematic analysis was performed using abductive open coding followed by refinement of codes. Three overarching themes were identified in line with theoretical expectations, namely personal factors (motivation and self-regulatory strategies), relational factors (teachers' practices, parental achievement expectations, peer influences), and structural factors (the educational system). Afterwards, an abductive thematic network analysis was conducted to explore and theorise about potential relationships between the emergent themes in the data. It was found that parental expectations for higher performance and the teachers' behaviours were associated with students' language achievement. Task-related characteristics and peers influenced students' regulation of effort in learning. The students' believed that they were not objectively graded and frequent summative assessments created test anxiety. The findings are discussed in light of existing empirical evidence and in terms of educational implications.

*Keywords:* Metacognitive self-regulation; motivation; academic achievement; parental expectations; educational system; teachers; feedback; test anxiety; self-regulated learning; thematic analysis

## 6.1. Introduction

Students live in a rapidly changing world where the ability to understand and produce written text is becoming more challenging and necessary (OECD, 2019a). Humans' mental representations, learning, and cognition are heavily reliant on language (Gottlieb, 2016; Halliday, 1993). Yet, many adolescents lag behind in the acquisition of language-related competencies nowadays (Council of European Union, 2018). Considering the fact that academic motivation and student engagement decline in adolescence (Wigfield et al., 2015), whilst metacognitive self-regulatory capabilities become more refined, I aim with this study to gain deeper insights into the factors that enhance or hinder adolescent students' self-regulated learning, motivation, and, subsequently, language achievement.

Quantitative studies on the motivational, self-regulatory, and relational factors explaining academic achievement abound. However, there is a paucity of qualitative studies exploring students' own perceptions of the factors that drive their learning and language-related achievement. This is a major limitation since qualitative studies can provide a more nuanced understanding of the factors that influence language achievement.

Therefore, the research community needs more qualitative studies to examine in greater depth students' perceptions of the plausible factors to that are related to their school language achievement by considering both external relational contextual (i.e., peers, parental expectations, teachers) and internal (i.e., motivational, self-regulatory) psychological learning factors. Qualitative studies focusing on students' perceptions of language learning and achievement in schools have the advantage that they can provide rich insights into the complex processes underpinning language achievement. By conducting such studies, researchers and practitioners can acquire a holistic and comprehensive understanding (Corbin & Strauss, 2014) of the reasons for students' engagement with learning activities and the strategies they employ.

### 6.1.1. A social-cognitive perspective on students' school language achievement

Social-cognitive theory (Bandura, 1997, 2001) can serve as a possible explanatory framework of the factors that influence school language achievement. Specifically, this theory suggests that humans' experiences, actions, thoughts, and emotions are co-determined by personal factors, environmental factors, and behaviour through reciprocal

interactions (Schunk & DiBenedetto, 2020; Schunk & Usher, 2012). An applied example of this hermeneutic framework is that (language-related) achievement, as a behavioural process (Schunk & DiBenedetto, 2020), is influenced by students' self-regulated learning (self-regulated learning) (a personal process) and by teachers' instructional behaviours and parents' performance expectations (i.e., environmental processes). In turn, teachers' instructional behaviours, parental expectations, and students' self-regulated learning may also be influenced by (language-related) achievement and effort due to the reciprocal relations.

In this qualitative study, the primary objective is to elicit responses from students in order to gain a deeper understanding of how key environmental processes and self-regulated learning are associated with their language achievement in school. To this end, given the existing quantitative evidence (Caro et al., 2016; Dent & Koenka, 2016; R. S. Jansen et al., 2019; Jeynes, 2022; Kyriakides et al., 2020), the focus was narrowed down to specific personal processes (i.e., motivation and self-regulatory strategies) and environmental factors (i.e., teaching quality (feedback and support), parental influences, and peer influences).

#### 6.1.2. Personal processes: Self-regulated learning

Students' self-regulated learning is widely considered a critical antecedent of academic achievement (Schunk & Greene, 2018). self-regulated learning encompasses a range of cognitive and metacognitive strategies deployed by students to direct, monitor, and control their cognition and motivation (Pintrich, 1999; Zimmerman & Moylan, 2009). The cyclical model of self-regulated learning, which has social-cognitive foundations, posits that students' need to activate their motivation prior to the application of self-regulatory strategies during the task processing (Panadero & Alonso-Tapia, 2014).

Students' academic motivation concerns what makes students engage with academic tasks and why they think the way they do about academic matters (Wigfield et al., 2015). The other important component of self-regulated learning is self-regulatory strategies, with frequently occurring self-regulatory strategies being task-specific and general metacognitive strategies (e.g., organisation, time management, help-seeking, self-evaluation, etc.) (Credé & Phillips, 2011; Zimmerman & Pons, 1986). Hence, in this study,

students were asked about their motives and strategies for engaging with school language class homework and schoolwork, as well as the reasons they wanted to get good grades in school language class. Some frequently discussed self-regulated learning strategies postulated by the cyclical self-regulated learning model are presented in the Table 18 below.

**Table 18. Self-regulatory strategies and definitions**

Task strategies	Use of specific strategies and techniques related to mastering and completing the task at hand
Imagery	Graphical (mental) representations to organise the information and assist learning and information retention (e.g., making an outline)
Time management	Strategies for completing tasks on time (e.g., using a timer)
Environmental restructuring	Techniques to improve the effectiveness of the proximal environment (e.g., using a computer to speed up writing)
Social help-seeking	Seeking social assistance while learning or performing a task

Note: These strategies were derived from the cyclical self-regulated learning model (Zimmerman et al., 2017; Zimmerman & Moylan, 2009).

As students progress to their secondary school years, reading and writing processes become interwoven (G. A. Reynolds & Perin, 2009). Thus, I asked students to reflect on and report task-specific and general self-regulatory the strategies they employ whilst writing a summary of a text. In the case of writing a summary of a text, several task-specific strategies have been reported in the literature. For example, one approach indicated that students begin the summarisation process by reading and assessing the task, reflecting on the reading topic, and analysing the text to identify the main arguments and ideas. Afterwards, they actually write the summary, and evaluating the completed task (J. Li, 2014). Another model of summarisation suggested that students deploy four types of strategies (Yang, 2014). Firstly, the students use planning strategies, such as making outlines, making notes, brainstorming. Secondly, evaluation strategies are needed, involving checking flow, grammar, spelling, paraphrasing, and keeping track of the structure (Yang, 2014). Thirdly, students also use discourse synthesis strategies, such as connecting knowledge and ideas,

and selecting main arguments and ideas (Yang, 2014). Finally, students utilise the text as a source by paraphrasing and quoting sentences and ideas (Yang, 2014). Another approach involves strategies such as constructing a hierarchical informational structure, creating an outline according to heading and subheadings, summarising the main idea, and writing the summary (G. A. Reynolds & Perin, 2009).

However, one could argue, in line with social-cognitive theory (Schunk & DiBenedetto, 2020), that self-regulated learning by itself does not suffice to explain students' academic achievement. self-regulated learning, as a critical antecedent of students' learning (Dent & Koenka, 2016; Panadero, 2017; Panadero & Alonso-Tapia, 2014), is contextualised (Ben-Eliyahu & Bernacki, 2015; Karabenick & Zusho, 2015). Therefore, I need to reflect also on the contextual factors that drive students' motivation and strategies to learn and achieve (collectively called self-regulated learning).

Yet, most quantitative studies exploring the effects of contextual factors on students' achievement (OECD, 2019c; Park et al., 2019; Teodorović, 2011) tend to neglect to 'listen' to students' opinions and perceptions of these factors. They also relied heavily on standardised questionnaires that preclude in-depth evaluation of students' 'lived experiences' of the factors that drive achievement. This signals the need for multi-layered perspectives on the factors that drive students' self-regulated learning and achievement.

### 6.1.3. Contextual process: Teachers' instructional practices

Quantitative research has shown that teachers' actions and what occurs in classes are strongly related to students' academic outcomes and the development of metacognitive capabilities (Caro et al., 2016). Teaching quality, which is a critical component of students' academic achievement, is typically defined in terms of effective classroom management, cognitive activation, and support (Lazarides et al., 2021). Teaching quality research indicates that competent teachers can cognitively activate students, provide support, and manage their classroom (Fauth et al., 2019). Such teachers more effectively promote students' achievement and motivation (Fauth et al., 2019). Amongst the many teacher support practices, evidence has shown that teachers' feedback is a powerful predictor of students' success (Hattie & Clarke, 2018; Hattie & Timperley, 2007). Yet, feedback does not always have a positive influence on academic achievement since students may not understand the

feedback message appropriately (Katsantonis et al., 2023) or may lower effort in the presence of affirmative feedback (Kluger & DeNisi, 1996). Thus, it becomes clear that I need to gain greater insights into students' perceptions of teachers' feedback and support.

#### 6.1.4. Contextual process: Parents and students' academic success

Parents play a significant role in influencing their children's academic achievement (Pinquart & Ebeling, 2020). Research studies have shown that parental involvement in children's education is very critical since reasonably high expectations of success have been connected to better academic outcomes (Jeynes, 2022). High parental expectations have also been linked to better academic engagement, educational persistence, and higher educational aspirations (Yamamoto & Holloway, 2010). Therefore, students were also asked to explain what their parents thought about their progress and grades in the language class. This permitted a greater understanding of how parental expectations are associated with school language achievement.

#### 6.1.5. Contextual process: Classmates and students' academic success

Peers are an important aspect of positive adolescent development since positive relationships with peers facilitate identity development (Katsantonis et al., 2022). Classmates are considered to be another important feature of learning in schools since they can be sources of motivation (through self-efficacy, self-concept) and can serve as an additional feedback source (Hattie & Clarke, 2018).

Cross-country research has also indicated that having classmates with higher past academic achievement was related to greater academic achievement (Chiu & Chow, 2015). Comparisons with classmates' achievement are an additional important factor associated with students' achievement. However, studies have failed to fully identify the processes through which classmates' characteristics are related to higher achievement (Chiu & Chow, 2015). Social comparison approaches in the classroom have noted a link between the ability to compare with other students and increased academic achievement (Blanton et al., 1999; Huguet et al., 2001). Specifically, studies have shown that students who believed they were better achieving than other classmates and were comparing their academic achievement with that of other students, who were good performers, actually had greater academic achievement (Blanton et al., 1999; Huguet et al., 2001). The social comparative process is a

source of information for building self-efficacy beliefs (i.e., self-confidence in capabilities) in an academic domain (Bandura, 1997; Usher, 2009a; Usher & Pajares, 2008). It is noted that Greek schools do not cluster students according to ability level (Ministry of Education, 2009) and, thus, normative achievement comparisons between students are feasible.

Nevertheless, peers can also have a negative effect on learning since it is known that distraction by peers or observing peers' maladaptive behavioural learning habits are linked with academic procrastination (Chen et al., 2016; Svartdal, Dahl, et al., 2020). Hence, a question was included in the interview schedule to tap into students' comparison to classmates. Another question was included to elicit responses regarding peer influences on students' learning behaviour.

#### 6.1.6. Related qualitative studies on students' motivation, self-regulation, and factors affecting academic achievement

No doubt in recognition of the potential of qualitative approaches in the study of contextualised self-regulated learning, a few qualitative studies have been conducted on students' motivation, strategy use (self-regulated learning), and contextual factors (Berkhout et al., 2017; Effeney et al., 2013b; Jouhari et al., 2015; Patel et al., 2015; Thomas et al., 2021). However, it is noted that most of these studies focused on higher education learning (e.g., medical college students) (Jouhari et al., 2015; Patel et al., 2015). A few other studies with adolescent student samples were interested in the role of specific contextual processes in promoting self-regulated learning strategies and motivation only, but did not examine specifically language achievement in secondary schools, which is the focus of the present study (Effeney et al., 2013b; Thomas et al., 2021). This additional argument highlights the novelty of the current qualitative study.

A qualitative study (Perry et al., 2002) with observations and interviews of teachers' of young children (kindergarten through Grade 3) reported that young students were able to engage in specific metacognitive self-regulatory strategies, such as planning, monitoring, and evaluating, as well as problem-solving whilst processing complex reading and writing tasks. However, this study focused more on teachers' voices and age-appropriate tasks for young children. In contrast, the current study focuses on skills and perspectives of students in adolescence when academic motivation declines (Wigfield et al., 2015) and metacognition

becomes more refined (Veenman et al., 2006). Egbert (Egbert, 2003) examined the links between language learning and student motivation in the secondary school foreign or second language classroom. This study found that students learning a second or foreign language were able to display flow experiences, such as interest in language learning activities, and were able to overcome any difficulties by striking a balance between the challenges and their capabilities (Egbert, 2003). Nevertheless, the current study has more finely tuned questions that tap into multiple language learning *and, specifically, achievement* experiences beyond just motivational aspects of learning.

Another study conducted with adolescents using (semi-/ un-) structured interviews reported, amongst other findings, that students held simultaneously multiple motivational beliefs (e.g., intrinsic, mastery and performance goals) (De Groot, 2002). Students were also found to report multiple self-regulatory strategies such as outlining, paraphrasing, memorising and self-evaluation strategies (De Groot, 2002). Additionally, poorer students were reported to be more influenced by environmental/ contextual factors, such as teachers and peer behaviours (De Groot, 2002). Yet, that study was focused on learning in general, whilst the present one is devoted to native language learning, language achievement, multiple contextual factors, and task-specific language strategies. Although conducted with higher education second language learners, a qualitative study revealed the importance of having good relationships with peers and teachers for students' engagement in addition to ascertaining that there is a match between the task, the supportive environment, and the learning objective (Sulis & Philp, 2022). However, that study (Sulis & Philp, 2022) does not provide in-depth information on adolescent students' self-regulated learning, and contextual factors in native language learning.

Another relevant qualitative study on parents and adolescent students' self-regulated learning indicated that parents involved in students' learning via structuring the learning environment and assisting with homework, amongst others, could facilitate students' self-regulated learning development (Thomas et al., 2021). A similar qualitative study explored adolescents' self-regulated learning strategies and found that teachers were most frequently associated with self-regulated learning strategy use, followed by parents, and then peers/siblings (Effeney et al., 2013b). Despite the above, these two qualitative studies were aiming to identify factors associated with self-regulated learning specifically,

whereas the current study places a major emphasis on language achievement. Finally, another study with university students found that family could be playing both a supervisory and a supportive role in the self-regulated learning of students, whilst peers could be acting either as positive or negative sources of self-regulated learning (Jouhari et al., 2015). It is clear from the above that the connections between the occurring themes on self-regulated learning, context factors, and, most importantly, with school language achievement are understudied.

#### 6.1.7. The present study

Many studies exploring the connections between self-regulated learning and academic achievement adopted a quantitative perspectives focusing on exploring hypothetico-deductive associations and effects (Cleary et al., 2021; Cleary & Kitsantas, 2017; Katsantonis, 2020). However, there is less qualitative research on adolescent students' perceptions of and beliefs about self-regulated learning and the factors that influence academic achievement. Qualitative approaches can bring many advantages to the study of self-regulated learning and contextual factors that drive academic achievement (D. L. Butler, 2002). Specifically, qualitative approaches can be used to derive finely-grained information not only about students' self-regulated learning but also about the contextual factors that drive their achievement since they enable in-depth understanding of the intricacies between the phenomena of interest in the context of interest (Creswell & Poth, 2018).

Given the paucity of qualitative studies with young adolescent students (aged ~14 years old), the present qualitative study had two main objectives. Firstly, to explore what are the common contextual factors underlying students' language achievement and fostering their self-regulated learning, and, secondly, to identify plausible theoretical relations between the emerging themes through an abductive thematic analysis. This is an educational research objective more timely than ever considering that recent data have also shown that more than 25% of Greek adolescent students achieved below the "minimum level of proficiency" that should be acquired by the end of secondary education (OECD, 2019b). Thus, the following research questions guided the present research:

RQ1: What are the students' perceptions about the common contextual teacher-related, parental, and peer-related factors underlying students' school language achievement?

RQ2: What are the plausible relationships between the emerging factors influencing school language achievement?

## 6.2. Method

### 6.2.1. Participants

Participants were sixteen young adolescent students with an average age of 13.94 years old (13 girls) from seven urban state-sector (i.e., publicly funded) schools. Students were recruited from multiple schools because I wished to document a variety of opinions, beliefs, and attitudes. Additionally, these schools accepted to participate in this study. All public secondary schools in Greece are obliged by law to follow the same textbooks and the national curriculum (Katsantonis et al., 2023). Assessment practices in language lessons are common across schools, as stated in the guidelines issued by the Ministry of Education (Ministry of Education, 2022); however, teachers have their own teaching styles. Thus, there are not significant differences in the structural characteristics of the schools and differences in terms of instructional material and assessment practices. Sixteen interviews were considered adequate since thematic saturation usually occurs at twelve interviews (Ando et al., 2014; Guest et al., 2006), and code saturation at nine interviews (Hennink et al., 2017). Students were recruited on a strictly voluntary basis. All students in the schools were informed by the headteacher about the research and its aims and had the opportunity to sign up for the study. The students exhibited a mix of achievement levels and came from a range of socio-economic backgrounds but most were from families with a low to average background. All students were native Greek speakers and belonged to the Greek ethnic group.

### 6.2.2. Interview protocol

In semi-structured interviews the topics and question prompts are predefined and open-ended. However, the sequence and wording of the questions may be adapted to the needs of each interviewee (Grix, 2019). Thus, semi-structured interviews were considered an appropriate and flexible method of data collection.

The interview protocol was designed according to past research on social-cognitive theory (Bandura, 1991, 1997), Zimmerman's self-regulated learning model (Zimmerman et al., 2017; Zimmerman & Moylan, 2009), and teaching quality models (Fauth et al., 2019,

2020). Given the importance of teachers for academic success, three questions were asked to identify what the students believe the role of teachers is in promoting or hindering their learning and academic achievement. A different set of questions were designed to elicit responses on motivational beliefs (e.g., self-efficacy, intrinsic and extrinsic motivation), parental expectations about achievement, peer influences, grading, and self-regulatory strategies. The questions on self-regulatory strategies were designed loosely based on the *Self-regulated Learning Interview Schedule* (Zimmerman & Pons, 1986). Students were asked to report on the task-specific and broader self-regulatory strategies they deploy while writing a summary of a text. Hence, I were expecting several self-regulatory strategies (for an overview see Table 18, section 6.1.2) to emerge, always in line with the cyclical model of self-regulated learning (Zimmerman & Moylan, 2009). The full interview protocol is presented in **Appendix E**. The homework scenario was selected as the prompt in the qualitative Study 3 because I argue that it can highlight students' self-regulatory capabilities and motivation irrespective of the regulatory and motivational influences of the school environment. In any way, students' interview reports were reflexive on their practices in schools as well.

### 6.2.3. Procedure

This study's data collection protocols have received ethical approval by the Psychology and Education Research Ethics committee, at the Faculty of Education, University of Cambridge, UK. Parents/legal guardians of the students provided written informed consent and the students assented to participate. The face-to-face interviews took place between late 2022 and mid-2023, in Greek secondary schools, whereby the lead researcher served as the interviewer. Each interview's audio was recorded by permission of the parents/caregivers and the interviewed students assented to the recording. Permission to conduct the research in schools was obtained by the Greek Ministry of Education (REF: 145640/Δ2/23 November 2022). Each semi-structured interview had the following format. It begun with an introduction (off-record) outlining who the interviewer was, what the purpose of the interview was, how the data would be used, and to obtain permission to record the audio of each discussion. Next, the main interview questions were asked followed by some background questions. Finally, the interviews closed by asking if the students had any further queries or concerns, they wanted to share.

#### 6.2.4. Qualitative data analysis

Given that interviews produced very rich discursive texts (Seidman, 2006), the Atlas.ti 23 computer software was utilised to implement a computer-assisted qualitative data analysis (Friese, 2019). Each interview's audio recording was transcribed in Greek. Afterwards, interview transcripts were imported into the Atlas.ti software. Thematic analysis (TA) of the transcripts (Braun & Clarke, 2006) was performed with the assistance of the software. TA is well-known analytic technique dedicated to the identification of explicit and tacit themes within the data corpus that are represented by codes (Braun & Clarke, 2022).

Subsequently, open coding was used, whereby the transcribed segments were coded using an abductive approach following the *Abductive Theory of Method* (Haig, 2005, 2008), which endeavours, guided by ongoing theory and research, to detect phenomena and to infer potential relations explaining the underlying mechanisms. In qualitative research methodology, this kind of TM is called "*abductive thematic analysis*", whereby both existing theory (hypothetico-deductive coding) and data (inductive coding) inform the coding process and theme identification (Thompson, 2022). The codes were then refined, which means that some were merged to form overarching themes or some were discarded. Several examples of the coding procedure and organising theme identification are provided in Table 19.

Afterwards, the open codes were iteratively evaluated for similarities using word frequencies and text search tools, and were further refined. It is noted, however, that the current study goes beyond the conventional abductive TA by utilising a thematic network analysis (TNA) (Attride-Stirling, 2001). The analysis procedure begun by clustering the basic themes (i.e., groups of themes derived from discursive text), which described characteristics of the data, into organising themes (i.e., groups of basic themes with shared features). These were then refined to result in the final overarching "global" themes (i.e., core summaries of the principal metaphor that captures the main issue) (Attride-Stirling, 2001). Hence, global themes are supported by organising themes, which comprise several basic themes (Goldbart & Marshall, 2014). Last but not least, abductive TNA, facilitated through Atlas.it, was utilised in the last step to suggest potentially explanatory mechanisms of school language achievement, though without the intention to make broad generalisations (Rambaree, 2018).

**Table 19. Examples of coding and organising theme identification**

Organising theme	Code	When to use?	Sample excerpt
self-regulated learning strategies and motivation	Self-efficacy	Apply this code when students report their capabilities in language class	"[I am] very confident that I can do well in the language course. If I want to, I can do everything. I base this on my abilities and my intelligence." -D08
Peer influences	Normative peer comparison	Apply this code when students report that they were able to compare their achievement with that of their classmates	"I'm doing very badly because my classmates give greater importance, but I'm also trying to build a foundation to go a little higher." -D16
Assessment practices	Test anxiety	Apply this code when students report psychological states that could be mapped onto the cognitive or emotional components of test anxiety	"It's a bit stressful at the beginning [to take exams and tests]. [However,] when you sit down and read carefully what the exercise asks of you, I believe that, even if you have studied a little, you will succeed [in the exam]." -D16
Teaching practices	Teacher support	Apply this code when students report that their teachers offer support during class	She always explains it [the assignment] to us. And she generally does during class sessions. Words that I don't know,

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she generally explains  
them on her own.” -D01

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### 6.2.5. Trustworthiness of the data analyses

To ensure the trustworthiness and the credibility of the analyses, a native Greek-speaking experienced teacher with a masters and two bachelors’ degrees, who was certified and proficient in English language, audited the data and the interpretations. This lent credibility to my interpretations. Additionally, the authors discussed any discrepancies in the data interpretations and resolved these amongst themselves. Given that the participating students were sampled from multiple schools and areas, I met the transferability criterion to a great extent. Dependability was achieved through the logical and clearly described steps in data analysis, and through the auditing process, as recommended in the literature (T. Kock, 1994). Thus, I could be confident that the present data analysis approach meets the trustworthiness criteria as outlined in the literature (Nowell et al., 2017).

## 6.3. Results

As mentioned earlier, the TNA begun by creating clusters of basic themes into larger organising themes (Attride-Stirling, 2001). Following iterative refinement of the codes, *five organising themes* were identified, namely self-regulated learning, teachers’ practices and parental achievement expectations, peer influences, and assessment practices. The details of each organising theme and indicative students’ responses are presented and analysed in the section below. These five organising themes map onto the three component processes outlined in social-cognitive theory (Bandura, 1991), namely personal processes, contextual/environmental processes, and behavioural (i.e., language achievement). The thematic network is presented later in Figure 24 and the TNA is summarised in detail in section 6.3.6.

### 6.3.1. Organising theme 1: Self-regulated learning strategies and motivation

Students exhibit to some extent agency in their learning and have their own motivational self-beliefs that underlie their school engagement, independent from contextual influences. From the students’ own words, it becomes apparent that students are able to deploy several metacognitive self-regulatory strategies when they are faced with a language lesson task.

The task-specific strategies are comprehensively presented in a thematic map in Figure 23. As shown in the thematic map in Figure 23, I observe that students utilised a wide variety of task-specific strategies. Several task-specific strategies identified involved significant metacognitive self-regulation (e.g., planning via making an outline; critically reflecting on the topic of text; revising; monitoring to stay on topic). Other recurring task-specific strategies were those revolving around organising and transforming the information through making headlines, subtitles, and creating a draft of the abstract. Discourse synthesis strategies were also very prevalent since students mentioned that they identified the main ideas of the text by underlining and combined the headlines to write the full abstract. The most recurring strategies before setting out to approach the learning task (performance phase of self-regulated learning) were memorising through underlining and organising and transforming the knowledge through making headlines. Very few students also mentioned making an outline. It appeared, though, that students had a limited repertoire of metacognitive self-regulation strategies while engaging with the task since the majority of the interviewees reported only the strategies appearing in Figure 23. Indicative excerpts from the interviews are presented below.

*“If it were a large text with paragraphs, I would add an extended heading and then try to write the summary and include some sentences that could enrich it.” -D02*

*“I usually underline the important parts from each paragraph and write a heading.” -D09*

*“I would first make a diagram so that I know roughly what will be included in the text.” -D10*

*“I will make something like a diagram. [I will think about] what to put first, how to start it. Some words to connect the sentences together.” -D07*

However, most students were engaging in a range of information- and help-seeking behaviours to find the information they needed in case of an unknown word. The two recurring basic themes were information retrieval through the internet and through significant others (e.g., parents, siblings, teachers).

*“Since technology is now an important part of our lives, I would search for it [the unknown word(s)] on the internet.” -D12*

*"I would use a dictionary or ask my teacher if I were in school. (Even though the teacher doesn't [usually] answer, she tells us to think about it)." -D03*

*"If there were any words I didn't know, I would first ask my parents and if they didn't know either, I would search the internet to find out." -D06*

Having completed the task, two recurring strategies were deployed, namely self-evaluation and other-evaluation. The first self-regulatory strategy was achieved through re-reading and making corrections to the produced summary, whereas the second involved a help-seeking behaviour whereby students asked other people for assistance.

*"Many times, when I write something, I may not capture the meaning 100% or use the perfect words, so if I read it again after 10 minutes - you know - I might find some mistake and improve it. Sometimes I take a short break and then reread it [the text], and, if there is something wrong, I correct it." -D05*

*"Usually, I read it [the written text] and consult with my parents because they know how to judge." -D09*

*"I would read it [the text] again and check if I added something extra that shouldn't have been there or if I left out something that should have been included." -D14*

Another important aspect of students' self-regulation was the regulation of effort. Students linked their effort with self-concept. That is, a lot of students mentioned that they would persist and invest enough effort in the exercise even if it was boring because they did not wish to hurt their self-concept.

*"I would do them [my exercises] so as not to seem like I'm not doing my exercises and not interested in the lesson. I would do them to tell the teacher [that I did the exercises]." -D15*

*"I never postpone anything for later. Generally, I start with the difficult tasks to finish them. I would do it to finish and feel good about myself." -D09*

However, many students found it challenging to self-regulate their effort and persist in the task, if the latter was boring. Academic procrastination was also a recurring basic theme either due to peers' influence (i.e., invitation to meet or play) or due to the boring features of a task.

*"I would try to do it, if not at that moment, then some other time." -D06*

*"I would either give it to my sister to write or simply tell the teacher "Sir, I didn't have time to write it." -D16*

*"I would go out, play for an hour or so and then come home and continue." -D15*

*"I might not have done it, if I couldn't do it at all. Otherwise, it would definitely have taken me a lot of time. That is, I would start, stop, take a walk, come back, and try again." -D07*

Students' motivational beliefs regarding learning tasks were also critical for engaging with a homework assignment. In most cases, students engaged with a homework assignment because of extrinsic reasons.

*"I do them - I try. Of course, if there is a test that day or if I don't have time, I won't do them, which is rare. And maybe I do them for my grade, so that I am not unfairly evaluated. It's not difficult, and it's good for practice." -D01*

*"I always complete them because first of all, I want to be consistent and through the assignments, I also gain knowledge myself. They will certainly be useful to me in the future, so this is a motivation." -D12*

Students also expressed a range of emotional responses (both positive and negative) with regards to the language lesson that were usually related to teachers' teaching style. Most recurring academic emotions were positive, but a few negative emotions occurred. Positive academic emotions included interest, liking, satisfaction, and enjoyment of the lesson, whilst negative academic emotions included mostly boredom. I observe that individual differences in academic emotions are tightly linked with the contextual factor of the teachers.

*"As a subject, it's quite interesting, but the teachers with whom I take this course don't make it more interactive so that all the students show their interest. So, personally, during class, I don't show the interest I would like to show." -D13*

*"The language lesson is generally very relaxed. But with the teacher I have, it becomes boring because she talks a lot. The lesson is not interesting." -D03*

*"So, I express ourselves and learn to speak with arguments and the like. So, I really like it, and I generally participate a lot in the conversations because the lesson is based on our*

*opinion and not on the book.” -D05*

Some participating students reported that they were modestly to highly *confident* in their capabilities to achieve in the school language lessons. Nevertheless, there was a minority of students who mentioned that they were less confident to succeed in language lesson. These few students based their self-efficacy judgements on previous academic challenges.

*“[I am] very confident that I can do well in the language course. If I want to, I can do everything. I base this on my abilities and my intelligence.” -D08*

*“With the language lesson I'm not really sure I'm going to do well because it takes a lot of studying. I'm already doing what I need to do for homework, so I think I'll do well but not as well as I'd like.” -D10*

*“I feel like I don't think I'm going to do very well because I'm struggling with the lessons that I need to show more dedication to.” -D16*

*“Not really, [I am not confident] because I think I have enough gaps [in my understanding or knowledge] in this course that I could hardly fill them.” -D12*

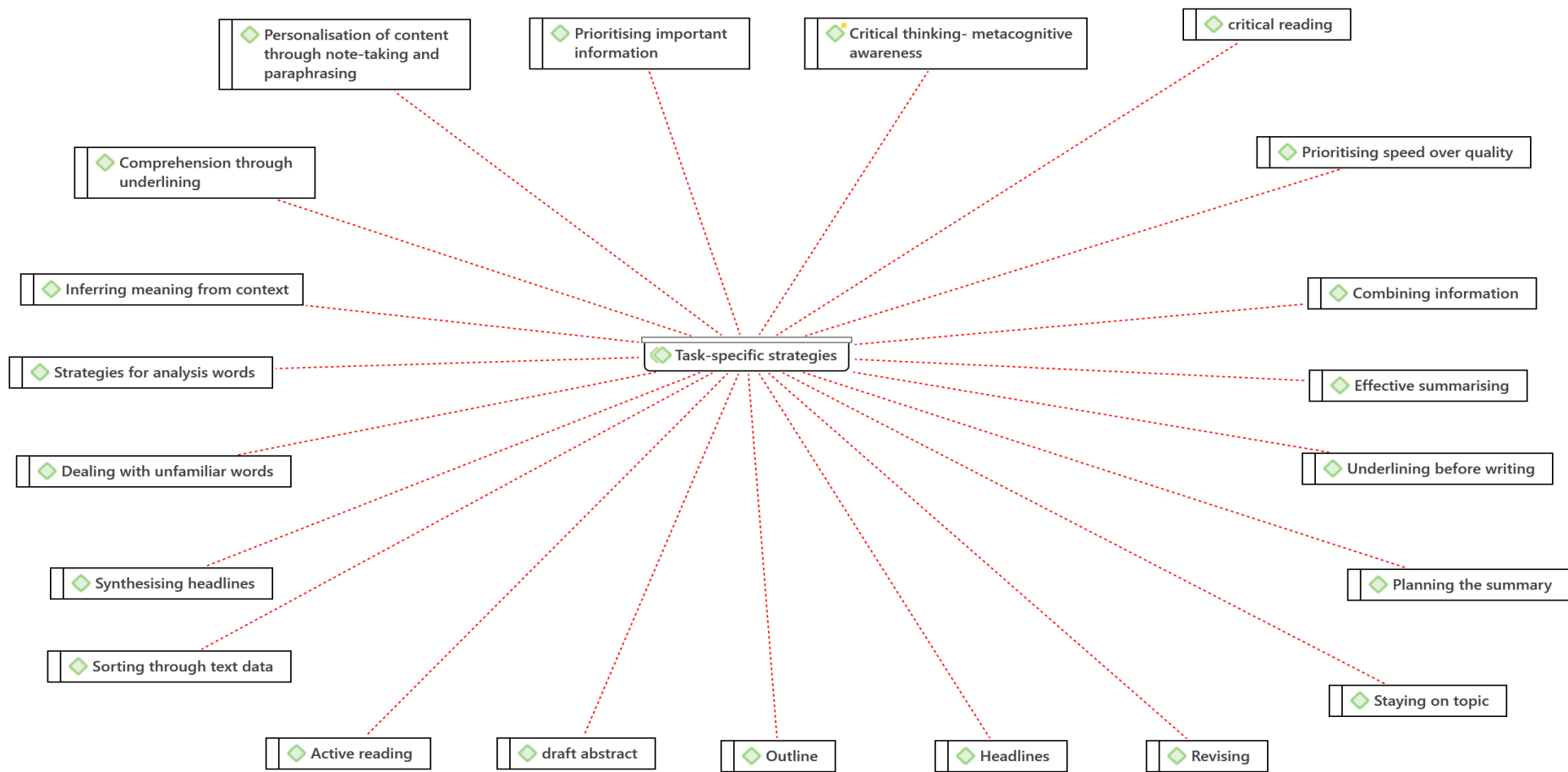


Figure 23. Thematic map of task-specific self-regulation strategies deployed by students in making a summary of a text for school language class. © Katsantonis & McLellan (2023b)

### 6.3.2. Organising theme 2: Teaching practices

The importance of teachers' strategies was revealed through mainly *three basic* themes, namely 'feedback from teacher', 'teacher support', and 'teaching style'. These basic themes were thought to reflect the overarching organising theme labelled "teaching practices". Feedback from the teacher refers to the extent to which teachers offered information regarding how students were progressing and learning. Some illustrative answers provided by the students are presented below.

*"Usually, the teacher will ask us a question to raise our hand and express our opinion. Even if some students don't raise their hands, their teachers will say "tell us your opinion." Then the teacher will say "that's a very nice answer. Do you agree with such and such?" Or the teacher will say that it doesn't quite match the topic." -D04*

For example, I see in the response of student D04 that teachers offer some form of corrective feedback to students when they pose a question in class. Another student (D09) also reported that the language teacher was a source of information regarding their progress in class.

*"I understand it [my progress] on my own from the exercises. But even our teachers tell us*

*if I're not doing very well, they inform us.” -D09*

*“My teacher also gives me feedback on my essays, on what I need to improve and what not, but he doesn't tell us our grades.” -D14*

Sometimes, though, it becomes apparent that the students had to ask the teacher for feedback, as in the case below.

*“I ask the teacher to tell me how she sees me [performing] in class, whether I participate and if I need to participate more.” -D10*

Nevertheless, when students were asked how they learnt about their progress in class, the vast majority of students did not report through teachers' process-oriented feedback. Rather most students reported that grading through exams was the main source of progress feedback. This is a form of 'knowledge of results' type of feedback, instead of formative feedback (Shute, 2008). Sample excerpts are presented below.

*“When I feel I can participate in the lesson. Usually by the grades [I learn that I'm doing well].” -D06*

*“There are tests and quizzes that let you know your progress and if you have understood some part of the [learning] material. After that, the teacher's words [let me know], especially if it's someone you trust and then comparing everything to the rest of the*

*classmates.” -D07*

*“[I learn] either from homework if I get it right, or when there is a parents’ meeting, and from tests and quizzes.” -D11*

Beyond teachers’ feedback, teachers’ supportive attitude was also an important feature that was identified. As in the case of student D01, school language teachers were usually supportive and were offering help when needed.

*“She always explains it [the assignment] to us. And she generally does during class sessions. Words that I don’t know, she generally explains them on her own.” -D01*

*“[The teacher] makes us think, I discuss more, she gives us our time, [and] if I don’t understand something, I ask her.” -D04*

*“The teacher will try to make me understand the subject with simple words.” -D12*

However, it appears that not all teachers are that helpful and mindful of students’ needs. Some students reported that their language teachers were unresponsive or unwilling to offer help, perhaps with the intention to make students work out the answer/solution themselves.

*“Usually, when I ask about a word, she may hesitate to tell me its meaning, which means*

*that I have to find it on my own. Of course, if I insist, she may give me either the exact meaning of the word or give me some hints to find it.” -D13*

*“I can ask him [the teacher] and sometimes he can answer me, but sometimes it can be a very easy word and he may not tell me.” -D14*

An engaging and stimulating teaching style is also an important feature of effective learning in class, according to the students. As can be seen from the excerpts below teachers may serve as “role models” and “inspire” some students. Another student indicated that there is a good classroom climate, whereby they can be comfortable with the teacher without being anxious about the teacher’s response. It also appears to be important to let students express themselves and speak up their minds.

*“Certainly, after so many years of teaching, [the teacher] has experience and knows how to handle certain issues better than us. [They] inspire us and serve as a role model.” -D07*

*“Generally, I feel comfortable with our teacher, I tell him if I don’t understand something and if I say something wrong, he doesn’t correct us. In exercises, because some kids may only write one sentence, he doesn’t judge them, he takes note of what they did. He encourages us.” -D09*

*“So, this year with this specific teacher, I have many discussions. We don’t rely so much on the book, he gives us handouts, I have discussions, and that’s the best part. We express ourselves and learn how to speak with arguments and so on.” -D05*

### 6.3.3. Organising theme 3: Parental achievement expectations

In general, two *basic* themes emerged regarding parents, namely ‘perceptions of parental expectations’ and ‘parental emotional responses’. These basic themes were clustered under the broader organising theme called “parental achievement expectations”. As will be shown below, students were aware of what were their parents’ expectations and were, thus, either investing more effort or were more easy-going with the class expectations.

*“In tests, if I don’t do well, I don’t tell them [my parents] my grade, so they can only know from the report card. However, I think that they [my parents] want me to be a bit more studious.” -D08*

*“I believe that all parents always want something more for their children, and especially my mom would like something more from me – she has very high goals. My dad is satisfied, especially since he knows that it’s not a subject that I lean towards. So, it’s logical that I’m not that interested.” -D07*

*“My parents believe that I can do much better, so they are not very satisfied, but it’s okay, they won’t cry over it.” -D12*

*“[My parents] are proud of me because they want me to be my best and they reward me for that as well. They don’t have any complaints because I’m doing well.” -D11*

#### 6.3.4. Organising theme 4: Peer influences

Normative comparisons usually occur within classrooms. Students attempt to understand their progress and performance by comparing their language class achievements with those of the rest of the students. From the interviews, it became apparent that students are able to draw inferences from normative peer comparisons.

*“I’m doing very badly because my classmates give greater importance, but I’m also trying to build a foundation to go a little higher.” -D16*

*“I think I’m better than some, worse than others.” -D06*

From the words of students above, I understand that students are able to gauge whether they are underperforming in school language class compared to their classmates. Nevertheless, students also exhibit an understanding of the reasons why the rest of the students in class are performing, as is the case of student D12 and D07 below. Therefore, normative peer comparison can serve as a form of “peer feedback”.

*“There are some students who don’t try at all, so obviously I’m doing better than them because they don’t try, but there are others who either like the subject more and attend more, and so they do better, or they may be better students on their own. So, I think I’m average.” -D12*

*“I think well because there are many students who are not interested in the lesson at all, which is not nice at all because the classroom atmosphere changes completely. That is, when very few students are interested, it makes you feel a bit awkward and it is also disrespectful to the teacher, to the class itself, to me.” -D07*

When students were asked what they will do if their friends called them to meet or play, some students stroke a balance between social and academic activities. Nevertheless, academic procrastination due to peer influences (mainly distraction) was also a quite prevalent topic, as shown below.

*“I think creating [pleasant] ‘memories’ is better than just doing a summary, so I would create the ‘memories’ with my friends and then I would definitely make time for the summary.” -D12*

*“It’s not a sure thing. It depends. I mean, sometimes when I start something there’s no way I can stop it, which is the most likely. But if I was able to go out with my friends, meet them, and then come back and finish it, then I don’t think that would be a problem.” -D07*

*“I would go out, play for an hour or so and then come home and continue.” -D15*

*“I’d either do it a little faster to finish it or go out and do it later.” -D06*

As I can see from the above excerpts, peer influence is a significant factor that is associated with students’ levels of regulation of academic effort. That is, some students may decide to delay the educational activities, whereas other students may give priority to the academic task before socialising.

#### 6.3.5. Organising theme 5: Assessment practices

Another important major organising theme identified was related to the assessment practices used in schools. According to the students’ responses, the assessment practices mostly placed pressure on the students. Direct pressure is conceived through test anxiety. Take for example the excerpts from the students below. It can be observed that the (frequent) mandatory tests make students anxious about language class and achievement.

*your performance. So, a simple written test that causes you a lot of anxiety just because of the name "exams" will not show what kind of student you are." -D12*

*"It's a bit stressful at the beginning [to take exams and tests]. [However,] when you sit down and read carefully what the exercise asks of you, I believe that, even if you have studied a little, you will succeed [in the exam]." -D16*

*"I believe that students should not be so stressed, but since I myself get anxious, I cannot express a different opinion. I think that, if the education system or the school worked a little more smoothly and did not pressure the children so much and had high aspirations and expectations for them, then I believe I would not care so much about the grade and I would not be so anxious at school." -D11*

Nevertheless, some students also believed that the educational system's assessment and grading procedures were also important features, but grades were not objective. That is, students' official grades are inflated.

*“Generally, I believe that there should be evaluation that is objective and not subjective, which is not [objective] just because I get good grades. That is to say, those who get 13 points may deserve 4. Those who get 18 may only deserve 16.” -D01*

*“I believe that grades are necessary, i.e., it is not possible to go through an entire school year without being graded in order for you to see for yourself what your abilities and strengths are. On the other hand, I do not believe that they accurately reflect the student’s overall image.” -D07*

#### 6.3.6. Solving the puzzle: How are the emergent themes connected?

Last but not least, by utilising an abductive theory of method (Haig, 2005; Thompson, 2022), an attempt was made to make plausible theoretical linkages between the themes and school language achievement. This is presented graphically in the abductive TNA in Figure 24.

According to social-cognitive theory and in line with the present research objectives, it is assumed that students’ motivation and cognitive and metacognitive strategy use (self-regulated learning) were influencing achievement. The basic themes reflecting personal motivation and self-regulated learning strategies were the following: academic emotions, students’ motivation for doing homework, task-specific and general self-regulatory

strategies, and academic procrastination. These components were clustered together to form the organising theme labelled “self-regulated learning strategies and motivation”.

Language achievement in schools is also assumed to be associated with teachers’ teaching practices. Teaching practices were another organising theme which included the following basic themes: perceptions of feedback provision, teachers’ support during class, and general instructional practices. From educational effectiveness studies (Caro et al., 2016; Kyriakides et al., 2020), it is known that teaching practices are associated with students’ achievement and metacognition. Therefore, teaching practices were linked with language achievement.

Another important organising theme was labelled “peer influences”. This broader theme subsumed normative comparisons with classmates’ performance in language class and academic procrastination due to peer influences. Given the importance of peer comparisons for achievement (Huguet et al., 2001) and building self-concept (Ferla et al., 2009) and self-efficacy beliefs (Usher & Pajares, 2008), I assumed that peer comparisons would be associated with language achievement. Since peers can distract from academic work (Svartdal, Dahl, et al., 2020), it was hypothesised that peer would influence regulation of effort invested in school- and home-work.

The fourth organising theme was called “parental achievement expectations”. This theme revealed the importance of parents through short-term parental expectations about academic achievement. High expectations were assumed to be associated with achievement, in line with past evidence (Pinguart & Ebeling, 2020). Parental achievement expectations were also inducing emotional responses in terms of satisfaction with students’ achieved standard of performance or being proud.

Finally, the last organising theme was called “assessment practices”. This theme reflected students’ perceptions of the assessment practices. In Greece, the national law has specific provisions regarding the frequency of students’ assessment (Ministry of Education, 2016). In general, the students believed that the educational system through its frequent grading and assessment procedures was unfair and created test anxiety, which was assumed to influence language achievement in schools.

In conclusion, all the above are compatible with the basic tenets of social-cognitive theory (Bandura, 1997; Schunk & Usher, 2012). In other words, this means that the five organising themes could be arranged in three global themes, namely personal, relational, and structural factors. As personal factors, I define students’ motivation and self-regulated learning strategies. Relational factors include parental achievement expectations, teachers’

practices, and peer influences. Finally, structural factors referred to assessment practices that are required by the educational system. Relational and structural factors were assumed to reflect contextual/environmental processes in line with social-cognitive theory. Hence, the study shows how personal and contextual processes could be linked theoretically with language achievement, which is considered a behavioural outcome (Schunk & DiBenedetto, 2020).

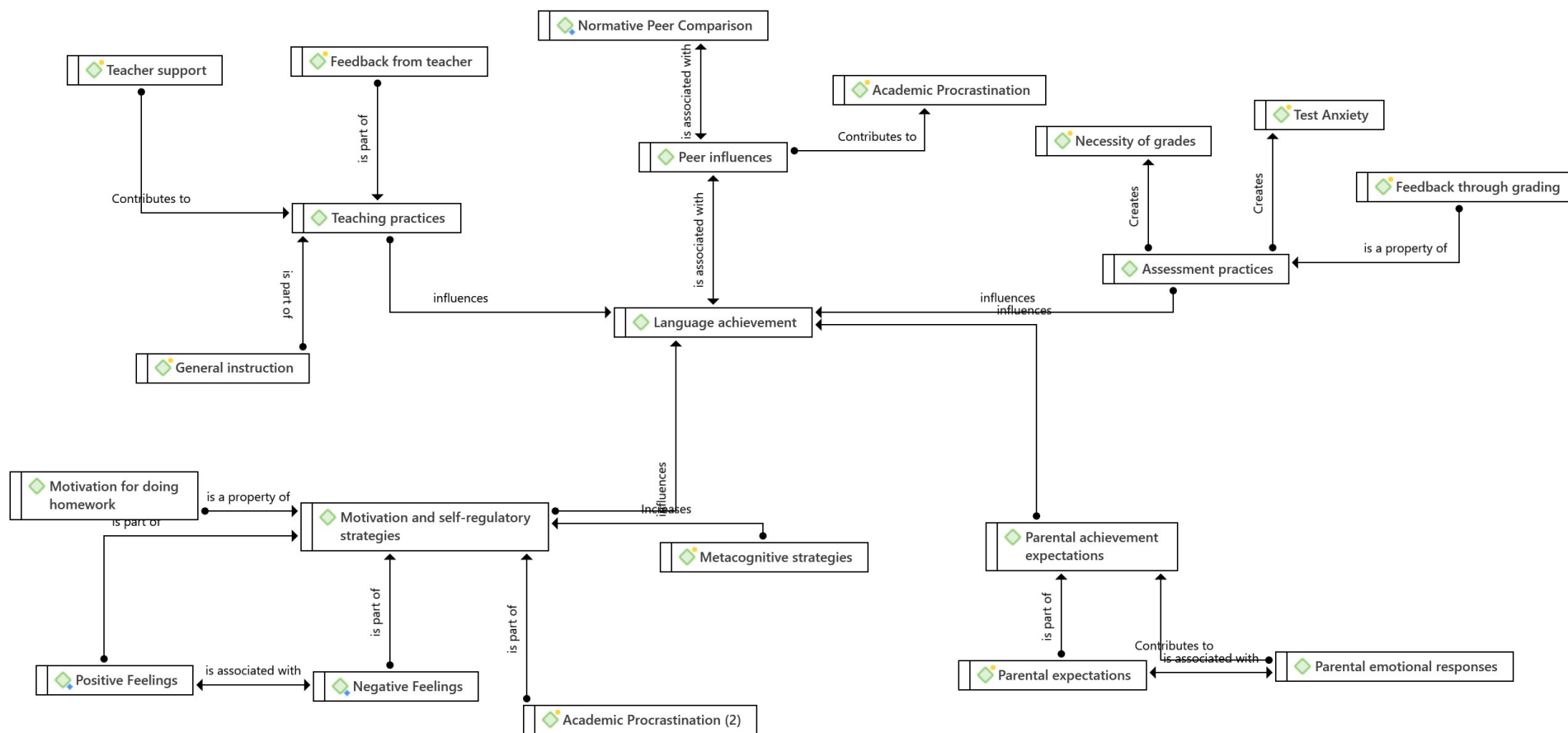


Figure 24. Abductive thematic network analysis of the organisational themes underpinning academic achievement. © Katsantonis & McLellan (2023b)

## 6.4. Discussion

Given that many adolescents lag behind in language-related competencies (Council of European Union, 2018) and acknowledging the reduced language achievement of Greek adolescent students compared to other countries (OECD, 2016a, 2019b), the present study sought to gain a deeper understanding of the environmental and personal processes underpinning language achievement in schools. To this end, sixteen semi-structured interviews were conducted to address the two research objectives. To the best of my knowledge, this might be one of the first studies exploring these issues through qualitative lens focusing on adolescents. Below, I situate my findings in the wider literature and discuss the educational implications arising from the findings.

### 4.1. Self-regulation strategies and academic motivation

Using the social-cognitive perspective (Bandura, 1991; Schunk & DiBenedetto, 2020), the findings underscore the importance of both environmental/contextual and personal factors as explanatory mechanisms of students' school language achievement (i.e., a behavioural outcome). Through the TNA five major organisational themes were identified, namely the teachers' practices, parental achievement expectations, peer influences, assessment practices, and self-regulated learning. To unpack the critical role of these explanatory factors, both preceding evidence and the data are concurrently considered.

Regarding the personal self-regulated learning processes identified through the interview data, the present data confirm that the students employed both cognitive (e.g., making an outline/diagram) and metacognitive (e.g., critical thinking, revising) self-regulated learning strategies. Students were usually utilising organisation and transforming self-regulated learning strategies by making outlines, headlines, sorting through the text's data, and synthesising the information by combining headlines. However, students did not display a variety of self-regulated learning strategies and mostly relied upon similar and limited self-regulated learning strategies. For example, some other strategies reported in the self-regulated learning literature (Zimmerman & Moylan, 2009), such as time management strategies (i.e., keeping track of time), specific goal-setting (i.e., setting clear goals of

what is expected to achieve), environmental restructuring (i.e., using a computer to write the abstract, or preparing writing materials), or self-monitoring (through self-questioning), self-consequences (i.e., promising rewards), were not mentioned at all when students were confronted with the learning task. On one hand, these findings appear similar to past evidence suggesting that students deploy few strategies when studying (Karpicke et al., 2009). On the other hand, this might indicate that students were very focused on completing the task and had automated the specific task strategies. There is some support for this in the self-regulated learning literature (Efklides, 2011).

Amongst the potential self-regulated learning strategies, students were particularly engaging in social assistance/help seeking behaviours, whereby they tended to ask parents, sibling, and/or teachers about unknown words. Through this strategy, it becomes apparent how important are significant others in the learning process. The students also faced some challenges in the regulation of their effort and persistence in learning task, if the task was boring. This finding is closely related to the academic procrastination literature, whereby unpleasant, boring, and aversive tasks may result in unnecessary delays in task completion (Svartdal, Klingsieck, et al., 2020). Finally, given the critical role of both cognitive (Völlinger et al., 2018) and metacognitive (Artelt & Schneider, 2015; Katsantonis, 2020) self-regulated learning strategies for improving academic outcomes, the students appeared to hold sufficient self-regulated learning strategies but there was still room for improvement in terms of variety of strategy use.

Regarding students' academic motivation, it was found that students had a tendency to mention both intrinsic (i.e., enjoyment, interest) and extrinsic (i.e., instrumental reasons) motives. This reinforces empirical evidence that students hold multiple motivational beliefs at the same time (Putarek & Pavlin-Bernardić, 2020; Skaalvik et al., 2015), despite the fact that the extrinsic motives (e.g., to be fairly graded, for the sake of appearances) appeared to be slightly more prevalent. This is further supplemented by the students' responses when asked about effort and persistence in the task, where they linked effort and persistence with maintaining a positive self-concept. This finding might suggest some form of cultural specificity

since maintaining a reputation is an important aspect of Greek culture (Uskul et al., 2010).

Previous studies with college/ higher education student samples found significant variation in students' capability to employ a range of self-regulated learning strategies to be effective learners (Berkhout et al., 2017; Patel et al., 2015). However, the current findings indicated that students reported quite similar task-specific and general self-regulated learning strategies when confronted with a language class task. Although other studies with college (Berkhout et al., 2017; Jouhari et al., 2015) and younger (Effeney et al., 2013b; Thomas et al., 2021) students placed emphasis on the importance of contextual processes and factors for promoting or inhibiting self-regulated learning strategies, I go beyond this and underscore the importance of contextual factors for both self-regulated learning and language achievement in secondary schools. Additionally, in this study, I examined students' perceptions of a range of factors, whereas other studies focused only on specific contextual factors. The different contextual processes associated with language achievement are discussed below.

#### 6.4.1. Teaching practices: Teachers' support, feedback, and teaching

The findings from the thematic analysis revealed that teachers played an important role in fostering engagement and persistence with the language class activities. The three main basic themes identified, namely teachers' feedback, teachers' support, and teaching style, were relevant for students' school language achievement.

Regarding feedback, which was noted to be negatively associated with science achievement in Greece (Katsantonis et al., 2023), it was found that feedback was more oriented towards understanding rather than actual assessment during class time. However, the vast majority of students mentioned that they learnt their progress in language class through grades from exams and quizzes. A rather recent meta-analysis has connected this kind of 'knowledge of results' feedback with practically no learning and achievement gains (Van der Kleij et al., 2015). This might also suggest that process-oriented feedback is not very prevalent. From the data analyses, it became apparent that few students received feedback aiming to improve

strategic learning, which is significantly related to greater motivation and achievement (Dignath et al., 2008).

The importance of the teachers has also been noted in the teaching quality and effectiveness literature (Caro et al., 2016; Fauth et al., 2019). Nevertheless, the present findings elucidate how much weight students give to the quality of the teaching practices for the whole class. Students also noted the importance of teachers for the classroom climate and for fostering engagement in discussions with them beyond utilising prescribed textbook materials. Although not the main focus of the present study, it seems likely that cognitive activation teaching strategies (i.e., critical thinking, reasoning beyond the curriculum content) are more preferred by some students. This is in line with teaching styles research (Echazarra et al., 2016). Additionally, a supportive teaching style was also found to be very important for students' learning according to their own reports. Quantitative research has shown that having a supportive teacher is connected to higher achievement, even though teacher support is rather low in Greek secondary schools (OECD, 2019d).

#### 6.4.2. Parental achievement expectations and language achievement

Parents also play an important role in nurturing students' achievement (Pinguart & Ebeling, 2020) and self-regulated learning (Pino-Pasternak & Whitebread, 2010). The current findings also corroborate this and suggest that parents tend to have high academic expectations for their child. However, students are also aware that their progress may not satisfy their parents, which means that parents clearly communicated to their children their expectations about achievement. Although students reported that their parents expressed their satisfaction or dissatisfaction or pride with their academic progress, other important aspects of educational expectations were not mentioned by the students. For instance, parental educational expectations also include aspects such as conveying an enjoyment and a value of learning, as well as linking current progress with later career aspirations (Hill & Tyson, 2009). Despite that parental expectations have been linked in the past with increased academic achievement (Jeynes, 2022; Pinguart & Ebeling, 2020), I can see from the interview excerpts a 'stationary effect', whereby

students, despite being aware of their parents' high expectations, did not seem particularly *motivated* by these.

#### 6.4.3. Peer influences and academic work

The thematic analysis findings also confirmed that students were able to make self-referent assessments of their ability in school language class based on a social comparison process. This is an important finding since self-concept and self-efficacy in an academic situation serve as motivational sources and can be necessary before deciding to engage in an academic task (Efklides, 2011). Although not presented in the findings above, it was noticed that students with comparably high self-concept usually had also high self-efficacy and mostly positive emotions in class. This latter finding indicates a positive association between self-concept, self-efficacy, and affect. The ability to compare with classmates' level of performance is quite important since this social comparative process fulfils the psychological needs for self-enhancement, self-evaluation, and self-improvement (Dijkstra et al., 2008). Quantitative empirical evidence has highlighted that upward comparisons (i.e., with better achievers) can boost achievement (Blanton et al., 1999).

The thematic analysis also revealed another important link between peers and learning. Even though the need for belonging in a peer group, time spent with peers, and the need to socialise as typical developmental features in adolescence (B. B. Brown & Larson, 2009; Newman et al., 2007; Ragelienė, 2016) cannot be discounted, a likely hypothesis is that peers (friends) can also influence students' learning since they can distract them from academic work. Although past quantitative studies have discussed peer influences in terms of 'role models', whereby having procrastinating peers was linked with greater self-procrastination (Nordby et al., 2017; Svartdal, Dahl, et al., 2020). However, in the present study, I found a new way through which peers influenced students' academic procrastination; that is, peers could be a significant factor that leads to academic procrastination by detracting from persisting to academic work. Nevertheless, most students seemed to be able to strike a balance between social needs and academic demands, whereby procrastinating by deliberately delaying working on the academic

task for the sake of meeting friends would not lead to failure to complete the learning task even though that probably does not guarantee successful completion.

#### 6.4.4. Assessment practices and test anxiety

An interesting theme that emerged through inductive coding was that most students were dissatisfied with the current assessment practices implemented in schools as prescribed by the educational system (Ministry of Education, 2016). Although there exists significant literature on students' dissatisfaction with the assessment system in higher education (Deeley et al., 2019; Mikulić et al., 2015), this phenomenon is rather understudied in secondary school. Students characterised the examination system as "horrible" and reported that it was creating test anxiety. These findings highlight that what pre-occupies students is the cognitive aspect of test anxiety, namely worrying over a prospective exam (Putwain, 2008). Research has shown that the cognitive component of test anxiety is negatively associated with academic achievement (Putwain, 2019; von der Embse et al., 2018) and, therefore, we need to take steps to reduce students' exam stress and test anxiety.

Many adolescent students highlighted that they were worried about their prospective performance in exams, but at the same time they found that formal assessment was needed to evaluate how well they were progressing in their learning and studies. This formal assessment through testing indicated to some extent that students were getting significant progress feedback through formal procedures of summative assessment rather than formative teacher feedback. Nevertheless, as several studies have noted (Harks et al., 2014; Van der Kleij et al., 2015), knowledge of results (i.e., grades) is not a good form of feedback since it does not provide students with details about their strengths and weaknesses and does foster potentially unfair comparisons. Emphasis on formative, rather than summary feedback through grades, is highly desirable in education (Shute, 2008).

A unique feature that has also emerged through the interview data is the subjectivity of assessment. A lot of students complained that summative assessment through grades was not objectively capturing their effort and achievement. Even though the teaching materials, curriculum, and guidelines are quite standardised in Greece (Kougias & Efstathopoulos, 2020), teachers have a degree of flexibility in

terms of setting exam topics thus students' summative grades capture effort and participation during the classes (Ministry of Education, 2016). This may be the reason why students are displeased with the current exam and grading practices. Although grading variability is observed in other schooling contexts too (Cizek et al., 1995), this is a widespread issue in the Greek educational system from my experience.

#### 6.4.5. Implications for policy and practice

Given that thematic and code saturation was reached since students tended to repeat similar answers to the questions asked, I could be confident that the present qualitative findings shed more light onto the contextual and individual processes underlying students' school language achievement. Although the study design does *not* permit far-reaching generalisations, several key findings are concerning and should be considered in future educational research aiming for educational practices in classrooms and policy-making decisions. First of all, parents are encouraged to have high expectations regarding their children's academic progress, but also to make sure that their children invest more effort in homework and schoolwork. Having high expectations without following up on these, may not be productive. Secondly, teachers should attempt to give more constructive formative process-oriented feedback during class sessions, to inform students about their strengths and weaknesses by going beyond official grading practices, and to provide both individualised and generic support while students work on academic tasks. Educationalists need to reconsider the role of grading since this creates a 'league table mentality' and can harm students' self-concept when inaccurately comparing with classmates. Moreover, teachers should take steps to alleviate students' test worry over prospective tests and exams, which could increase students' performance. Finally, the present findings suggest the need for formulating multilevel theories of students' self-regulated learning.

#### 6.4.6. Limitations

Although the study produced some important qualitative evidence on the factors underlying students' school language achievement, it is noted that the findings might not be broadly generalisable. Furthermore, I recognise that sampling on a voluntary basis may have added some bias to the findings given that some

particularly vulnerable students and specific demographic groups may not have signed up for the study. Another limitation due to the voluntary nature of the participant recruitment is that there were fewer male participants than female, which may skew the perspectives presented. However, the few boys that participated appeared to have similar experiences to the girls. Finally, I recommend a future replication of the findings with greater sample sizes, even though the sample size was adequate for this type of ideographic research since the objective was to gain in-depth insights into students' perceptions and 'lived experiences' of learning, and the contextual factors that affect them. This would not have been possible with larger sample sizes and more quantitatively-oriented designs.

## 6.7. Conclusion

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In conclusion, this study aimed to gain deeper insights into the contextual, self-regulatory, and motivational factors associated with adolescent students' language achievement. Through sixteen semi-structured interviews with adolescents, I examined students' perceptions and beliefs about self-regulation strategies, academic motivation, teaching practices, parental achievement expectations, peer influences, and assessment practices as factors contributing to students' language achievement. The findings revealed that students were adequately employing a range of task-specific and general self-regulatory strategies in language tasks; however, there was still room for improvement in terms of acquiring a range of strategies. Students' academic motivation encompassed both intrinsic and extrinsic motives and the most prevalent academic emotions were enjoyment and interest, though some students reported being bored in language class. Teachers and teaching practices appeared to be a crucial factor for students' motivation in class and language achievement. I found mixed support for the importance of parental achievement expectations since some students did not appear particularly motivated by their parents' expectations. Classmates' achievement as a comparison standard and peer influences on regulation of effort were also noted. Finally, assessment practices in schools in terms of frequent tests and exams were a matter of concern since students reported that current models of summative assessment were inducing test anxiety and were permitting subjective

grading. Overall, the current study contributes valuable insights into the factors associated with language achievement.

## Chapter 7. General Discussion

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For many decades now, countries participate in cross-national surveys assessing adolescent students' cognitive literacy skills (i.e., reading, mathematics, science) (OECD, 2014, 2016a, 2019b). Yet, as might be expected, all countries do not perform to the same standard in these cognitive domains. Particularly in Greece, the international comparative studies have noted that adolescent academic achievement in language and science domains is declining over time (see Figure 1). Developmental evidence suggests a decline in adolescent academic motivation and engagement (Gottfried et al., 2001, 2007; Wang & Eccles, 2012; Wigfield et al., 2015), but a developmental spurt in metacognitive skills (Veenman et al., 2006; Weil et al., 2013). However, strategies for the regulation of learning in school settings have been found to decline as well (Bardach et al., 2023; Wang & Eccles, 2012). The above raise the question to what extent adolescents' personal inputs in terms of academic motivation and self-regulation, as well as contextual factors are salient correlates of academic achievement in less well-performing educational systems. To this end, I designed and conducted three empirical studies. The general purpose of those three studies was to explore this question, gain greater insights into the motivational and metacognitive self-regulatory processes, and the contextual factors associated with academic achievement in Greece.

The general discussion chapter begins with an overview of some of the key findings (see **section 7.1**). Having covered the main findings, I discuss the contribution of my research to extant knowledge (see **section 7.2**). Specifically, I discuss my findings in light of the existing literature on the theories of self-regulated learning (see **section 7.2.1**) that I reviewed earlier (**Chapter 2**). Additionally, I explain my contributions to the knowledge regarding the contextual factors underpinning academic achievement (see **section 7.2.2**). Furthermore, I discuss how the findings from the three empirical studies can contribute to educational policy and practice (see **section 7.3**). As with every research study, I reflect on the strengths and limitations of my work (see **section 7.4**) and conclude with directions for future research (see **section 7.5**).

## 7.1. Overview of the key findings

The three studies comprising this PhD thesis offer new insights into the processes and factors underpinning academic achievement. In this section, I provide a brief overview of the key findings in order to frame the subsequent discussion.

In Study 1 (see **Chapter 4**), I examined through a secondary data analysis the relations between several motivational beliefs (i.e., self-efficacy, intrinsic and extrinsic motivation, and performance goal orientation) and teachers' feedback both at the student- and school-level. Multilevel structural equation modelling indicated that teachers' feedback was a positive predictor of self-efficacy, which, in turn, positively predicted intrinsic and extrinsic motivation, and performance goal orientation. Thus, self-efficacy served as a partial mediator between perceived teachers' feedback and the rest of the motivational beliefs in the model. Despite my initial expectations, I found that perceived teachers' feedback was a negative predictor of science achievement in Greece. Last but not least, the model revealed that students' motivation and perceived teachers' feedback were explaining only 15% of the variance in science achievement.

In Study 2 (see **Chapter 5**), I run several latent profile analyses to explore subgroups of adolescent students with different motivational and metacognitive self-regulation characteristics. The results of the analyses based on a large sample size of 1046 students from different schools and regions illustrated three well defined profiles of students' motivational and metacognitive self-regulation characteristics, namely minimally motivated and metacognitively self-regulated, adequately motivated and metacognitively self-regulated, and exceptionally motivated and metacognitively self-regulated students. Nearly 30% of the sample belonged to the minimally motivated and metacognitively self-regulated profile. The exceptionally motivated and metacognitively self-regulated students were the best-achieving, whereas the minimally motivated and metacognitively self-regulated were the worst-achieving in this sample. Identifying as male (versus female) and greater age predicted greater odds of membership to the minimally motivated and metacognitively self-regulated profile. Greater socio-economic status and speaking the Greek language at home predicted less chances of membership to the minimal profile only.

The third (Study 3, see **Chapter 6**) part of the trilogy of empirical investigations involved a qualitative interview-based study with 16 Greek-speaking native adolescent

students from seven schools. Thematic analyses revealed that adolescent students were aware and utilising a variety of both task-specific and global self-regulation strategies to complete a written task assignment. Furthermore, the analyses indicated five organising themes, namely self-regulated learning strategies and motivation, teaching practices, parental achievement expectations, peer influences, and assessment practices. Based on the abductive theory of method, several working hypotheses were generated. That is, external contextual factors, such as parental expectations for achievement, peer relations, and teachers' teaching practices, were linked with students' perceptions of achievement. Most students reported that they usually learnt of their progress through 'knowledge of results' feedback. Exam practices (e.g., tests or summative assessments) were reported to be linked with increased test anxiety. Students' motivation for doing homework was mostly extrinsic but intrinsic motivation was also mentioned. Protecting self-concept had an additional motivational force.

## **7.2. Contribution to extant knowledge**

The trilogy of empirical studies comprising this dissertation share a unique emphasis on the two facets of academic achievement that have been found to decline in Greece, namely language and science. The other key focus of all the studies was on motivational and self-regulation strategies as correlates of different facets of academic achievement. In the present section, I outline the contribution of my research to motivation and metacognitive self-regulation theories, researchers' understanding of the factors underpinning academic achievement, and feedback theory in relation to academic achievement. Research on self-regulated learning indicates that self-regulation of learning, conceptualised holistically as being motivationally, cognitively, and metacognitively active (Pintrich & Groot, 1990; Schunk et al., 2014), is turning into the cornerstone for students' learning and later-life health, career development, as well as life-long learning (Schmitz et al., 2007).

### **7.2.1. Contribution to the theory on self-regulated learning (motivation and metacognition)**

Despite the existence of multiple theoretical models of self-regulated learning, in the present thesis, I focused on the cyclical (Cleary & Zimmerman, 2012; Zimmerman, 2008) and the metacognitive and affective (Efklides, 2017; Efklides et al., 2018) models of self-

regulated learning. Both models contribute to researchers' understanding of how students learn and achieve and integrate motivational beliefs with metacognitive strategies in the self-regulatory process (Cleary et al., 2012; Efklides, 2011; Panadero, 2017). Hence, my thesis' contributions are more closely related to these theoretical models. In the sections below, I start by outlining my contribution to the literature on the links between the key motivational beliefs that have been implicated in self-regulated learning. Afterwards, I devote another section on the interplay between motivation and metacognitive self-regulation.

#### 7.2.1.1. Interplay between motivational beliefs

The cyclical and the MASRL theoretical models of self-regulated learning (Efklides et al., 2018; Zimmerman & Moylan, 2009) do not clearly describe the interplay between students' motivational beliefs. Specifically, an existing debate in the literature concerns the predictive relations between students' self-efficacy, goal orientations, intrinsic and extrinsic motivation. Past empirical studies have been inconclusive regarding the directionality and the sign of the predictive relations between these motivational beliefs. Some studies suggested that self-efficacy is a positive predictor (McGeown et al., 2014; Skaalvik et al., 2015), a negative predictor (McGeown et al., 2014), or a not significant correlate (Walker et al., 2006), or even a positive correlate (D'Lima et al., 2014), or a positive predictor (Liao et al., 2014) of extrinsic motivation. The picture is also not clear with regards to the links between self-efficacy and intrinsic motivation (enjoyment, interest or inherent satisfaction- (Ryan & Deci, 2020). Some empirical studies have reported a flow of predictive effects (either directly or indirectly) from self-efficacy to intrinsic motivation features (Chatzistamatiou et al., 2015; Putwain et al., 2013, 2016; Skaalvik et al., 2015), whereas other studies illustrate a positive direct or indirect effect from intrinsic motivation to self-efficacy (An et al., 2021; J.-C. Hong et al., 2017; Villavicencio & Bernardo, 2016; M. Y. Yi & Hwang, 2003). Existing evidence is also mixed in terms of the association between self-efficacy and goal orientations. For instance, some studies suggested that students' goal orientations were predictive of academic self-efficacy (Coutinho & Neuman, 2008; J. M. Phillips & Gully, 1997; Roeser et al., 1996). Yet, other evidence points towards a predictive effect from self-efficacy (or self-perception of capabilities) to learning goal orientations (Diseth, 2011; Geitz et al., 2016; Putarek & Pavlin-Bernardić, 2020; Skaalvik & Skaalvik,

2006). Past research has also shown that students with high self-efficacy prefer to engage with challenging tasks (Boggiano et al., 1988). This suggests that students with greater self-beliefs in their capabilities might be more oriented towards mastery or performance-approaches to learning.

From all the above, it becomes clear that the predictive ordering between the motivational beliefs is an actively researched issue and ongoing 'debates' occur in the literature. Hence, Study 1 contributes to the discussion regarding the inconsistency in empirical research findings on the interplay between students' self-efficacy (see section **2.3.4.**) and the different motivational beliefs. Particularly, the study adds to existing debates regarding the lack of clear ordering of the predictive relations between motivational beliefs in the cyclical and MASRL models of self-regulated learning (see sections **2.2.1** and **2.2.2**). In Study 1, I showed that self-efficacy was a positive predictor of students' intrinsic and extrinsic motivation, as well as students' performance-approach goal orientation. This suggests that the importance of holding high self-efficacy beliefs for improving different types of academic motives. Additionally, the findings in Study 1 constitute a significant contribution to knowledge since they provide evidence on a nationally representative level through the representative PISA data, which cannot be true for the majority of other studies exploring the interplay between these motivational beliefs. In other words, the overwhelming majority of the past evidence regarding the structural links between the different motivational beliefs comes from convenience samples, whereas the current evidence is derived from nationally representative data which makes it more robust and representative of the wider student population (Heeringa et al., 2017).

The findings regarding the positive interplay between self-efficacy, intrinsic and extrinsic motivation, and performance-approach goal are also important since an overwhelming proportion of empirical studies have been conducted in countries with high academic performance, as noted by the PISA studies (OECD, 2019b). Therefore, there is less representative and non-representative evidence coming from less well-performing educational systems, such as Greece.

Additionally, Study 1 and Study 2 contribute to extant knowledge regarding the overlap and salience of the different motivational beliefs for academic achievement. Established theoretical works on goal orientations make a clear distinction between mastery

and performance goal orientations (Ames, 1992; Ames & Archer, 1988b; Dweck, 1986; Elliot & Hulleman, 2017). In fact, Elliot and Hulleman (2017) wrote that the dichotomous (i.e., mastery versus performance goals) model of goal orientations, as well as newer theoretical developments in the goal orientations field, make clear conceptual distinction between mastery and performance goals. In the works of these theorists (Ames, 1992; Ames & Archer, 1988b; Dweck, 1986; Elliot & Harackiewicz, 1996; Elliot & Hulleman, 2017), mastery and performance goal orientations drive different behavioural, cognitive, and emotional responses. Yet, the findings of Study 2 (see **Chapter 5**) suggest that, despite having significant discriminant validity, adolescent students' higher mastery goal scores were statistically positively associated with higher performance goal scores. This indicates that students can hold to some extent both mastery and performance goals at the same time. This evidence calls upon researchers to reconsider theoretical distinctions between mastery and performance. Perhaps, this evidence suggests that researchers and theoreticians need a spectrum definition of goal orientation, whereby adolescent students can vary in their degree of goal adoption.

At the same time, both Study 1 and Study 2 indicate sizeable positive correlations between indicators of intrinsic motivation and extrinsic motivation. This finding contributes to existing theoretical models of self-determined motivation (Ryan & Deci, 2016, 2020) by adding to the literature (Guay et al., 2015; Litalien et al., 2017) that suggests that the boundaries blur between different types of motivation from externally regulated extrinsic motivation to intrinsic motivation. Nevertheless, the findings reinforce the idea that extrinsic motivation, even in the most benign form of task value/ instrumental motivation, undermined academic achievement (see Study 1). This latter finding adds to the debate about the contribution of extrinsic versus intrinsic motivation to achievement. A recent large-scale meta-analysis of 183 studies by Cerasoli et al. (2014) showed that intrinsic and extrinsic motivation were not incompatible but intrinsic motivation was a more salient predictor of achievement when incentives, an indicator of extrinsic motivation, were present. Given the above considerations, the current findings add to past evidence by providing additional evidence in favour of an undermining, rather than enhancing, association with academic achievement.

Although motivation is an important aspect of self-regulated learning, metacognition has also a role to play according to the cyclical (Zimmerman et al., 2017) and the metacognitive and affective models (Efklides, 2019). Additionally, self-regulated learning is also informed by the interactions between motivation and metacognition (see section **2.2.2**). Hence, I am now focusing on these interactions in the section below.

#### 7.2.1.2. Person-centred findings on the interplay between motivation and metacognitive self-regulation

Beyond the above contributions, the evidence from the person-centred Study 2 provides significant insights into the relation between students' motivation and metacognitive self-regulation. First, the nature of the interactive associations between metacognition and motivation are unclear despite the fact that the MASRL theoretical model (Efklides, 2011, 2019; Efklides et al., 2018) posits the existence of interactive relations between students' metacognition and motivation (see section **2.2.2**). Study 2 challenges past empirical models addressing these interactive relations from a person-centred approach (Dörrenbächer & Perels, 2016; Karlen, 2016; Nelson et al., 2015). In other words, despite the fact that past studies reported a variety of interactive patterns (both positive and negative), Study 2 showed with a large adolescent student sample that only three well-defined patterns emerge. That is, there is a close one-on-one correspondence between adolescent students' motivational and metacognitive self-regulation levels. The above results from Study 2 challenge to some extent past empirical evidence suggesting that moderate levels of metacognitive capabilities might be compensated by higher motivational beliefs in the prediction of academic achievement (Creß & Friedrich, 2000; Karlen, 2016; Pintrich & García, 1993). Additionally, this finding extends existing knowledge on the MASRL model (Efklides, 2011, 2019; Efklides et al., 2018) by refining researchers' understanding of the synergy between motivation and metacognitive self-regulation. Overall, this finding suggests a potential need to reconsider how researchers should model motivational constructs along with metacognitive self-regulation. Particularly, researchers actively working in this field might want to use latent profile analysis or latent class analysis to test for potential interactive patterns between motivational beliefs and metacognition.

Moreover, Study 2 reveals that treating students, rather than variables, as the units of analysis holds merit since the latent profile analyses indicated significant heterogeneity in the motivation and metacognitive self-regulation of the student population. The cyclical conceptualisation of self-regulated learning (Cleary et al., 2012; Zimmerman, 1990a, 2002; Zimmerman & Moylan, 2009) discuss the predictive relations between variables through a cyclical feedback loop from motivational beliefs to metacognitive and self-regulatory strategies to self-reflection and reappraisal. It could be argued that these variable-centred approaches do not reflect how within groups students exhibit similar levels of metacognitive self-regulation and motivation, but different levels between groups (for a discussion of variable- vs. person-centred see Laursen & Hoff, 2006). In simpler terms, this means that there is homogeneity within groups but heterogeneity between groups. In contrast, the person-centred approach of motivation and metacognitive self-regulation in Study 2 provides greater detail into the motivational and metacognitive self-regulation capabilities of different clusters of individual students. This calls for researchers and theoreticians to pay greater attention to the individual students' motivation and metacognitive self-regulation characteristics rather than adopting an averaged perspective on students' motivation and metacognitive self-regulation.

An additional finding of Study 2 that is important is that a sizable proportion (28.5%) of students were found to score below average (nearly 1SD) on both motivation and metacognitive self-regulation. These students also exhibited the lowest academic achievement. This finding resonates with cross-national comparative evidence coming from PISA studies, which report that more than 25% of the country's adolescent students have below the minimum degree of proficiency in literacy that all students should achieve by the end of compulsory secondary education, as outlined in the United Nations Sustainable Development Goals (OECD, 2019b). Thus, these below average scores in motivational beliefs and metacognitive self-regulation might be linked with the nation-level declines in academic achievement observed by the PISA studies. Another source of information regarding the self-regulation strategic skills of the students comes from the qualitative Study 3. In Study 3, I found that the majority of students, despite reporting several task-specific and global (see **Chapter 6**, section **6.3.1**) self-regulation strategies, appeared to have a limited range of task-specific and global self-regulation strategies in language achievement.

Although the latent profile analyses did not reveal qualitative individual differences in the form of negative interactions, the quantitative individual differences that were identified are still very important (Hickendorff et al., 2018) from a methodological, a practical, and a theoretical perspective. From the methodological perspective, the latent profile analysis with quantitative individual differences are more appropriate given its probabilistic nature (Hickendorff et al., 2018) than old-fashioned discretising practices of continuous variables, whereby analysts select arbitrary and possibly non-theoretical cut-off points (e.g., mean- or median-splits). Using arbitrary categorisation methods leads to loss of information and can lead to spurious conclusions (Altman, 1991; Altman & Royston, 2006; Binney & Mansournia, 2023).

From a practical perspective, the results of the latent profile analyses can be used to identify future Greek students who may need help to improve their levels of motivation, their metacognitive self-regulation strategies, and, subsequently, their achievement. Finally, from a substantive perspective the current findings of quantitative, rather than qualitative, individual differences are still important for two reasons, according to the literature (B. Muthén, 2003). First, the last latent profile called minimally motivated and metacognitively self-regulated is being predicted by gender (male), age, socio-economic status, and language spoken at home. Second, the minimally motivated and metacognitively self-regulated profile is a robust and differential predictor of worse achievement compared to the other profiles. The latter means that it has sufficient criterion validity (McDonald, 1999). Therefore, it is characterised by validity through its expected nomological network with other variables, which means that it is predicted by and predicting other variables as would be expected by theoretical assumptions (James, 1973).

### 7.2.2. Contribution to the knowledge on the contextual factors underpinning academic achievement

Although motivational and metacognitive self-regulatory factors are important for academic achievement, meta-analytic studies suggest that they explain on average a rather small to modest proportion of the variance in academic achievement (cf., Dent & Koenka, 2016; R. S. Jansen et al., 2019; Richardson et al., 2012). Meta-analytic evidence has shown that individual student characteristics, such as test anxiety, self-efficacy, effort regulation,

can account up to 20% of the variance in academic achievement (Richardson et al., 2012). Some other evidence suggests that successful learning interventions on students' characteristics are 29% effective, whereas teachers are 35% effective, home-related factors are 22% effective, curriculum-related factors are 32% effective, and teaching factors are 30% effective (Hattie, 2010). Thus, learning scientists need to consider how other factors beyond students' motivation and (metacognitive) self-regulation strategies are related to academic achievement. Such contextual factors considered in this thesis included teachers' feedback, parental educational expectations, and peer influences (see conceptual Figure 3). However, quantitative evidence on these associations is ample (e.g., Chen et al., 2016; Pinquart & Ebeling, 2020; Tao et al., 2022; Wetsch, 2009) but qualitative studies on these contextual factors and students' achievement are scarce.

#### **7.2.2.1. Teachers' feedback and academic achievement.**

The first contextual factor that was examined in this thesis was teachers' feedback practices, given their importance for students' learning. Evidence from educational effectiveness suggests that teachers' practices contribute to students' metacognition and achievement (Caro et al., 2016; Kyriakides et al., 2020). Despite the fact that past theoretical works support the notion that teachers' feedback is positively associated with achievement (Hattie & Clarke, 2018; Hattie & Timperley, 2007; Wisniewski et al., 2020), the evidence in Study 1 challenge this. In other words, Study 1 showed that feedback was a negative predictor of science achievement (see **Chapter 4**). In the robustness analysis performed (see **section 4.3.3.**), the effect of teachers' feedback frequency on reading achievement was also negative, but did not reach statistical significance. This evidence alludes to the fact that quantity of feedback, even though feedback was measured as quantity of feedback provision in various domains (see Appendix C), is not the ideal way to go forward if one wishes to improve students' academic achievement in Greece. The results underscore the pitfalls of teachers' feedback, suggesting that quality, rather than quantity, is what might truly matter for adolescent students' academic achievement. Despite the above, the only way through which the frequency of teachers' feedback had a small positive association with science achievement was indirectly through students' motivational beliefs. Therefore, students' motivational beliefs play the role of a protective factor that can propagate the positive influence of the quantity of feedback. Another possible explanation for the negative

association between feedback and achievement may be linked with the findings of Study 2. That is, Study 2 (see **Chapter 5, section 5.3.1.1.**) revealed that as adolescents became older (from age 12 years to age 16 years), their metacognitive self-regulation skills decreased. Therefore, even if Greek adolescent students (aged ~15 years) receive feedback from teachers, it might be possible that they are less metacognitively self-regulated to appropriately utilise the feedback message(s) in order to improve. This negative association might also point towards cultural differences. Cross-country differences in the effect of feedback on achievement have been reported in the past (Eriksson et al., 2020), which signals that students in particular countries may have different ways of processing the feedback message or teachers have different approaches to feedback provision.

To explain the negative association between the quantity of teachers' feedback and academic achievement, I use at this point some of the theoretical pathways postulated in the Feedback Intervention Theory (see **Chapter 2, section 2.6.**) (Kluger & DeNisi, 1996; C. D. Smith & King, 2004). According to Figure 12 (see **section 2.6.**), two possible scenarios may occur here regarding the science-specific and language-specific motivation. First, students might evaluate the feedback message as positive, that is, the feedback-standard discrepancy is reduced, but students might not perceive this as an opportunity to increase their self-goals (e.g., self-esteem) and, thus, reduce effort. The students might also increase their effort in the face of a larger (negative) discrepancy between feedback and standard, but this increased effort might not decrease the gap between the feedback message and the standard and students might not believe in their success and, thus, turn their attention away from the learning process (Kluger & DeNisi, 1996). These two scenarios show how feedback might be associated to lower achievement given the shift of attention away from the learning and the reduced effort.

An alternative scenario associated with a negative direct link between feedback and achievement is illustrated in Figure 13 (see **section 2.6.**). The science and language tasks might not be well-known to the students. The students might attempt to generate some strategies to approach the solution or completion of the tasks, but these strategies may fail, leading students to quit their effort (Kluger & DeNisi, 1996). This possibly might lead to reduced achievement. Another equally plausible scenario that might explain this negative direct association is linked with meta-task processes, as illustrated in Figure 14

(see **section 2.6.**). The Figure 13 explains that the feedback message might be directed to self-goals (e.g., self-concept, impression management) and an emotional pathway is activated. In one hypothesis, if the task is important for students' self-goals, but the (language or science) tasks are not easy, then there is a subsequent reduction in achievement (Kluger & DeNisi, 1996). However, if the tasks are perceived as unimportant for students' self-goals (i.e., "who cares about this science problem?"), then students might follow a pathway of reduced attention to the task with fewer cognitive resources (e.g., effort) and, subsequently, terminate effort and reduce achievement (Kluger & DeNisi, 1996).

All the above hypothetical scenarios describe from a theoretical point of view the many ways that the quantity of feedback is processed leading to reduced achievement. It remains to be seen in future studies which of these explanatory mechanisms holds more merit. Whilst the quantitative data of Study 1 revealed several concerns regarding teachers' feedback, the qualitative insights from Study 3 provide an important contribution to extant knowledge regarding the negative association between feedback and achievement. In the qualitative Study 3, the findings also revealed that students recognised progress feedback in terms of 'knowledge of results', but did not place emphasis on any other forms of formative progress feedback during class time (see **Chapter 6**). This indicates that the students might not recognise and appropriately utilise day-to-day feedback during class time, which is an explanation found in previous literature too (Black & William, 1998). From the majority of the students' reports, it became clear that the overall quality of the teaching (e.g., making the lesson interesting, going beyond the curriculum, etc.) played an important role for students' learning and achievement, according to the students' reports. Additionally, the interview findings reaffirmed the importance of teachers helping with students' academic tasks during class, instead of ignoring them in some cases (see **Chapter 6, section 6.3.2**).

#### 7.2.2.2. Parental educational expectations and academic achievement.

Past evidence has highlighted the importance of parental educational expectations for students' academic achievement (X. Fan & Chen, 2001; Jeynes, 2022; Pinguart & Ebeling, 2020), even though the meta-analytic correlation was rather small (e.g.,  $r=.15$ ). From the findings of Study 3 (see **Chapter 6**), it became clear that parents' educational expectations were formulated based on students' previous achievement level, confirming the feedback loop between past student achievement and parental expectations (Seginer, 1983). Yet, the

qualitative findings suggest that the participating Greek adolescent students did not appear particularly motivated by parental expectations. Perhaps, this finding may be explained by the fact that parents appeared to adjust their expectations according to their children's capability (see **Chapter 6, section 6.3.3.**).

Just as parental educational expectations can shape adolescent students' academic perspectives, peers, too, can play an important role in students' academic achievement and persistence. Thus, I discuss peer influences on academic achievement below.

#### 7.2.2.3. Peer influences and academic achievement.

Peers are an important aspect of adolescent development and many adaptive and maladaptive patterns of behaviour have been attributed in the past to the influence of peers (Katsantonis et al., 2022; Parker et al., 2015). First, peers and, especially classmates, have been postulated as important sources for the formation of academic self-efficacy (Usher, 2009b; Usher & Pajares, 2008) beliefs and self-concept (Chiu & Chow, 2015; Ferla et al., 2009; Marsh, 1987). Second, very recent evidence has proposed that peers can serve as contextual factors that can detract from persistence in academic work (Svartdal, Dahl, et al., 2020). The qualitative evidence highlighted that the adolescent students tended to gauge their level of academic achievement in comparison to that of their peers. This social comparative process is particularly helpful for increasing students' academic achievement by fulfilling their psychological needs for self-enhancement and self-evaluation (Corcoran et al., 2011).

At the same time, when asked whether they will persist in doing academic homework if asked to meet friends, a significant portion of the students indicated that they will delay the academic task to meet and socialise with friends (see **Chapter 6, section 6.3.4.**) Although past empirical evidence has examined the links between peers and academic outcomes (Crosnoe, 2000; Roeser et al., 1996), the role of peers as social contextual factors that can disrupt the regulation of effort invested in homework has not been clearly highlighted in the literature to the best of my knowledge. In the above findings, the reader can observe some discrepancies between the ability of the students to compare with their peers' achievement and the role of peers as potential disruptive influences on the regulation of effort in homework. The reason for this is probably related to the fact that these two findings refer to two different contexts and two different social roles, namely

classroom versus home and friends versus classmates in general. The homework scenario was chosen because completing an assignment in class also involves other-regulation (Panadero & Järvelä, 2015) and many distracting factors.

Beyond the proximal peer, teacher, and parental influences on academic achievement, the assessment practices implemented in educational systems can be crucial factors for student success. Thus, I discuss the findings on assessment practices below.

#### 7.2.2.4. Assessment practices and academic achievement.

Another important finding regarding the contextual correlates of academic achievement in Greece concerns the test anxiety of the students when confronted with written assessments. This finding emerged unexpectedly and inductively through the qualitative data (see **Chapter 6, section 6.3.5.**). Testing and assessment have been implicated as sources of anxiety in adolescent students (Paris et al., 1991; Zeidner, 2007). The current findings also confirm this, yet add to the past literature by highlighting the fact that, despite the worrying (i.e., a cognitive aspect of test anxiety) associated with a forthcoming assessment, adolescent students found assessments to be a necessary feature of school life. Notwithstanding the necessity of assessment reported by the students (see **Chapter 6, section 6.4.4.**), frequent assessment through unannounced tests or announced termly exams might be a factor that enhances students' extrinsic motivation (Ryan & Deci, 2000a) and I have shown in Study 1 that extrinsic motivation (i.e., in this case, instrumentality) is a negative predictor of academic achievement in the presence of the rest of the motivational beliefs.

Another dimension of assessment practices is related to assessment fairness. Study 3 (see **Chapter 6, section 6.3.5.**) captured students' perspectives and the majority of the participating students believed that teachers' grading practices were not fair and did not accurately capture their level of academic achievement. Specifically, in Study 3, students reported on a phenomenon of grade overinflation, which described the fact that students received higher than appropriate grades. This phenomenon is also seen through the data in Study 2, wherein the average grade across all students across 19 schools was a rather inflated  $M=15.97$  ( $SD=2.86$ ) from a scale potentially ranging from 1 to 20. This phenomenon might be linked with teacher fairness or accuracy in grading, but it is a rather unique issue. I call this finding unique since the systematic empirical-based knowledge on this

phenomenon is truly limited and under-represented in the international literature as mentioned by Oleinik (2009). This phenomenon is usually discussed in the higher education literature (e.g., colleges or universities, especially in the United States) (Pattison et al., 2013; Sadler, 2009), but there is a paucity of studies on secondary education. Therefore, my Study 3, through its abductive approach, adds by formally recording this phenomenon in the literature regarding the Greek context and contributes to existing theoretical debates by challenging the teacher-reported view of teacher fairness in student grading.

The above findings are indications of the students' perceptions of grading practices and grading fairness. According to the literature, teachers were inaccurately assessing students' academic functioning (Eckert et al., 2006) or were grading using inconsistent strategies (Alm & Colnerud, 2015). In contrast, recent qualitative evidence has come to light reporting that teachers valued fairness (Cheng et al., 2020) but some teachers placed value in and emphasis on different aspects of fairness (Tierney, 2014). Therefore, a possible explanation to the current findings regarding the grade inflation phenomenon, that students raised in Study 3, is that teachers' grading decisions in the Greek context are founded upon multiple factors, such as performance, effort, and student need (Resh, 2009), which might not be easily perceived by the of the students of this study. On the other hand, in the Greek educational system, a grade overinflation phenomenon has been previously reported in both primary and secondary schools in the media (Esos, 2019; Ipaidia, 2017). Thus, scholars need to understand that this phenomenon might be inversely associated with standardised testing scores, such as recorded in the PISA studies, since students are not actually given to comprehend the true extent of their capabilities.

### 7.3. Implications for educational policy and practice

As noted already in **Chapters 4 to 6**, the current findings have some implications for educational policy and practice in Greek schools. Although the implications are context-specific, that does not necessarily mean that they are not applicable to other educational settings with similar characteristics.

On the policy level, several suggestions could be made in terms of improving or revising current educational policies in Greece. First, since intrinsic motivation was found to be the strongest predictor of science achievement (Study 1), educational policies should encompass ways to build students' genuine interest and curiosity in science lessons. The

curriculum is known to serve as a structural constraint of students' agency (S. Baker & Le Courtois, 2022). Therefore, from a policy perspective, building students' intrinsic interest could be achieved through provision of greater flexibility in the selection of curriculum and teaching material, whereas now the curriculum and the teaching materials (i.e., student books) are fixed and predetermined by the Ministry of Education (see **Chapter 1, section 1.2.**).

Student-reported self-regulated learning (task-specific and global) strategies were variable (see **section 6.3.1**), but there was still space for improvement in terms of teaching, learning, and implementing strategies. Additionally, a significant proportion of the Greek adolescent students (28.5%) were characterised by comparatively low scores on metacognitive self-regulation (see **section 5.3.2.**). This suggests the need to make explicit in the national curriculum the value of metacognitive self-regulation and global self-regulation strategies. Since the educational system follows a top-down administrative and pedagogical structure (see **Chapter 1, section 1.2.**), structural changes in the curriculum are difficult. However, teachers do have some flexibility in terms of teaching strategies implemented in classrooms. Hence, teachers could also play a role in improving students' knowledge and application of self-regulatory strategies by explicitly teaching students to develop their (metacognitive) self-regulation skills.

From a policy perspective, teacher training programmes might be needed to help secondary school teachers realise what types of teaching strategies can facilitate or hinder academic achievement. This is particularly important since both the current studies' findings (Studies 1 and 3) and international comparative evidence (OECD, 2019d) have identified weak points in terms of teaching strategies and teachers' feedback in Greece in particular. This becomes more important than ever since secondary school teachers might not have undertaken specific teacher training prior to their employment in the educational system<sup>11</sup> (Bista et al., 2016).

Furthermore, it is crucial to amend assessment policies in Greek schools since students reported a phenomenon of grade overinflation both in Study 2 (see **section 7.2.2.4**) and Study 3. The issue of 'grade inflation' is rather known but neglected phenomenon in the Greek educational community, as shown in the media reports (Esos,

<sup>11</sup> From my experience, this is slowly changing these days as a new generation of teachers becomes employed.

2019; Ipaïdia, 2017). Stemming from this finding, a reasonable implication is that teachers should also be trained in different assessment and grading practices in order to grade students' achievement more objectively. Although standardised testing is a double-edged sword that has its own pitfalls (Koretz, 2009), it might act in a complimenting way and alleviate the issue of 'grade inflation' at the national, regional or local level (Mertler, 2017). This latter implication can also be applicable in other educational contexts, where 'grade inflation' has been noted such as the US (Tyner & Gershenson, 2020).

Connected to the above issue of assessment is the frequency of the exams, which was linked in Study 3 with test anxiety. In the public Greek educational system, the frequency and the format of prepared exams and unannounced tests is centrally stipulated to some extent by the Ministry of Education (Ministry of Education, 2016). Given that students were worried about prospective exams and how they will reflect on their overall achievement levels, it might be sensible to consider more formative methods of assessment or qualitative descriptive assessments of students' skills and achievements in schools. Additionally, policies could be constituted to reduce the frequency of assessments, which might be beneficial for students' achievement and reduce worrying over the tests and exams. The above implications could also be relevant for other educational systems that struggle with similar issues.

Some tentative suggestions for the role of peers and parents are considered here, always in light of the data collected as part of the thesis. First, parents could become more involved in students' learning and achievement by sitting together and discussing with their children about their achievement expectations. Schools could consider formulating an active partnership with the parents to develop realistic short-term parental educational expectations by providing frequent information sessions. These sessions could be designed to offer insights into students' progress, to jointly (schools and parents) set feasible goals, and provide advice on how parents could assist their children's learning at home. All these could potentially make parents' expectations to be more critical for students' learning and achievement. Regarding the implications for peers, it might make sense for schools to create cultures of co-operation by avoiding comparisons between classmates' academic achievement in order to avoid the creation of competitive mindsets or 'league table' mentality. Students should also actively try to regulate their effort when doing homework,

rather than interrupting concentrated effort to engage with friends. This could be achieved by clearly setting aside a specified time frame for interacting with friends (either online or in-person) and doing homework, respectively. To achieve this, a viable strategy could be to adopt the 'Pomodoro' method, whereby students consistently study for 25 minutes and take short breaks of 5 minutes and this process is repeated four times before taking a longer break from studying (Biwer et al., 2023).

On the level of educational practice, the current thesis' findings might be helpful for designing and implementing cognitive activation programmes in Greek schools. The findings on the associations between motivational beliefs and science and language achievement can be particularly useful. For instance, creating activities and selecting topics based on students' interest and enjoyment might enable them to engage more deeply in reflections, reasoning, and problem solving in science and language lessons. Recognising the potential repercussions of extrinsic motivation on students' achievement, it might be beneficial for adolescent students' achievement to place less emphasis on extrinsic motives, such as instrumentalities, incentives, or grades as rewards.

By encouraging students' self-regulated learning strategies, teachers can attempt to let students decide on the learning activities they prefer to engage with. Since some issues with teachers' feedback were identified in this educational setting (see Study 1 and Study 3), it might be helpful for students' learning and achievement to permit a peer-review process, whereby classmates can offer progress feedback on other students' written work. On the side of the teachers, it is important to make students understand what feedback truly means and to place emphasis on formative rather than 'knowledge of results' feedback, which is more promotive of students' learning and achievement (Shute, 2008; Van der Kleij et al., 2015).

On a final note, school teachers should attempt to reduce students' test anxiety and, specifically, worrying about upcoming tests. This could be achieved through successfully preparing students ahead of the test, reducing the number of unannounced tests, or implementing alternative assessment practices that can assist with students' grades. Teachers should make it clear that learning and understanding is what truly matters, rather than focusing on grades. The latter suggestion might help alleviate students' prospective worry over the examination and testing process in class. Regarding the phenomenon of

overinflated grades, teachers should accurately assess students' capabilities and skills. This could be achieved through implementing rubric-based criteria that are transparent to students. Teachers could also be trained to accurately assess students' progress and they should learn that inflated grades do not help students' learning. Additionally, it might be helpful to avoid numerical grading of secondary school students. In that case, policy changes would be needed to allow for descriptive in-depth reports (formative feedback) of students' learning and achievement.

#### **7.4. Strengths and limitations**

As with all studies, the current thesis also has some limitations but also some strengths that should be discussed. Specific limitations of each of the empirical studies can be found within each empirical chapter. Therefore, I will outline here some general limitations and strengths of the research design.

First of all, the quantitative part of the current thesis was characterised by above average statistical power considering the fact that the median sample size in educational psychology is 200 participants (Kline, 2023). Second, the advanced statistical techniques employed accounted for both between-school and within-school effects, which is a crucial requirement in school-based research since students within schools are more similar than students between different schools (Hox et al., 2017). Third, a range of motivational beliefs and covariates were considered when modelling the complex relations, which reduces the possibility of omitted variable bias (Wooldridge, 2020). Fourth, the procedures of the data analysis in the qualitative strand of the thesis were very transparent and trustworthy since it met the criteria (see **Chapter 6, section 6.2.5.**) for credibility, transferability, confirmability, and dependability (Nowell et al., 2017).

Despite the above strengths, there are also some limitations. First and foremost, the data were cross-sectional, which means that there is no temporal sequence in the order of variables. Thus, causality cannot be established from the current findings (Antonakis et al., 2010; Kline, 2015) since a snapshot of the adolescent students' learning and achievement experiences may not capture what occurs over time. Second, it is important to note that due to financial, time, and research practicalities constraints it was not possible to do a thorough measurement of all the different aspects of self-regulated learning that appear in the self-regulated learning models in a single study. This might have led to some form of omitted

variable bias (Antonakis et al., 2010), but students' and schools' spare time for research is rather limited. Therefore, it would have been impossible to take more of the students' time to engage in this research in line with the Ministry of Education's approval (see Appendix B). Third, the voluntary sample of the qualitative strand of the thesis might have excluded some vulnerable groups of students that typically avoid participating in research; however, it was very hard to persuade schools and students to sign up in that study. Fourth, it is important to also note that self-report measures have been utilised throughout this study, which might be subject to social desirability or recall bias (MacKenzie & Podsakoff, 2012; Podsakoff et al., 2003).

### **7.5. Directions for future research**

Given the above considerations in terms of strengths, limitations, and unanswered questions arising from the current thesis, I outline some potential directions for further research in this area.

To begin with, it might be important to conduct both short-term and long-term longitudinal studies on adolescent students' self-regulated learning. This kind of research could shed more light into question of how self-regulated learning processes unfold over time by truly accounting for the cyclical nature of self-regulated learning (see section **2.3.1**). Longitudinal research in this area is a particularly important enterprise that could shed more light into the dynamic relationship of motivation and metacognitive self-regulation within- and between- students. Future studies could also tackle the issue of the association between teachers' feedback and achievement. Specifically, it is important to go even deeper into this phenomenon and study why and under what conditions teachers' feedback might be beneficial or harmful for students' learning in Greece. In the discussion (see section 7.2.2.1.) above, I explained the potential ways feedback could lead to reduced effort and achievement based on the Feedback Intervention Theory (Kluger & DeNisi, 1998). Therefore, a future direction for me would be to examine which pathway(s) is/are actually activated. Additionally, it is important to cross-validate the current findings with future evidence coming from different measures and even bigger sample sizes. Specifically tied to the issue of measurement, some scholars recommend observational methods with younger children as a way to accurately capture state and trait growth in self-regulation (Eberhart et al., 2023). Thus, it remains to be seen how these observational methods could be

implemented with older adolescent samples. Further, more research exploring the role of peer influences and, especially, classmates on students' regulation of effort, academic persistence, and normative comparisons is needed. Additionally, more empirical studies are needed to explore whether and under what conditions the distinctions between students' different motivational beliefs blur in Greece. Given the proliferation of cross-national data on students' cognitive skills, motivation, and self-regulation, it is important to devote some future studies to explore the extent to which the above relations hold in different educational systems. Moreover, extra research is needed in Greece to examine the impact of different assessment practices on students' learning and academic achievement. Finally, it is important to explore how students' motivational beliefs and metacognitive self-regulation strategies function as a comprehensive system within different subgroups of students with different levels of achievement.

## **7.6. Concluding remarks**

In light of the above discussion, the current thesis complements and expands ongoing academic discourses. Specifically, the thesis adds to the knowledge on structure and the functionality of students' motivational beliefs, metacognitive self-regulation, and social contextual factors influencing academic achievement. First and foremost, the thesis explicates on the dynamic and complex relations between students' motivation by bridging different strands in the literature regarding the predictive relations of self-efficacy, intrinsic and extrinsic motivation, and goal orientations. These findings add depth and provide a fresh perspective using the representative PISA data for low-performing educational systems, such as Greece. The research studies challenge some previous theoretical conceptions of motivation models by tentatively suggesting a spectrum approach to goal orientations and further blurring the lines of rigid distinctions between extrinsic and intrinsic motivation. The thesis provides also new person-centered insights into adolescent students' motivation and metacognitive self-regulation by treating students as the unit of analysis rather than informants for variable-based research. Furthermore, the qualitative strand of the thesis sheds light on the interplay between personal motivational and self-regulatory factors and social contextual factors. Taken together, the presented findings pave the way

for a more refined understanding of the dynamics between motivation, self-regulation strategies, social contextual factors, and academic achievement.

In conclusion, the above findings would suggest that a holistic approach is needed in order to increase adolescent students' science and language achievement. Both internal psychological factors such as motivational beliefs and self-regulated learning strategies, as well as social contextual factors such as teachers' feedback, parental educational expectations, peer influences, and assessment practices need to be considered in order to increase adolescent students' achievement. This would imply that a social-cognitive perspective is necessary now more than ever considering the declines in adolescent students' academic skills.

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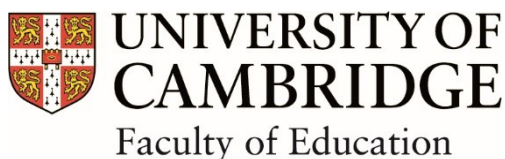
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**Survey Information Sheet**  
**[Parent/Carer version]**

Dear Parent/carers,

**Study title:** Self-efficacy and self-regulatory processes in academic achievement: A comparative study

**Study description**

This study is part of my doctoral project and aims to examine the role of culture and teachers' feedback on students' self-efficacy (confidence to achieve), motivation (learning for competence, enjoyment and interest in learning), and self-regulation (learning strategies) language achievement. In this project, I also look at how these concepts are related and what are the differences between schools.

**Your participation counts**

There are few studies examining the relationships of culture and teachers' feedback on self-efficacy, motivation and learning strategies. This study could help us make improvements to current schools' curriculum and understand whether and why there are cross-cultural differences in motivation and achievement. The findings could also prove useful for improving students' learning since they may lead to the creation of new teaching guidelines. Your school will also benefit from this study since it will be offered a free-of-charge workshop on staff training, as well as a report of the aggregated findings upon request.

**What does taking part in this study involve?**

Young people will participate in this study by filling in a questionnaire about self-efficacy, motivation, learning strategies, and language class achievement. The questionnaire will be completed during class time, supervised by your child's teacher. It is estimated that it takes about 15 minutes to complete the questionnaire.

**How do we deal with issues of confidentiality?**

The questionnaire is completely anonymous and does not require any sensitive or confidential data. The participation in this survey study will be in a group format and, thus, it ensures the anonymity of responses. Your child's responses will be kept confidential. Please, rest assured that *only* the lead researcher and his collaborators will have access to the anonymised data. Teachers and the school will not have access to your child's questionnaire responses.

**How will the child's responses be used?**

Your child's responses will be *combined* with those of other students and will be used in the PhD thesis, in publications and in presentations of the final findings. A copy of the *combined* findings will be made available to you upon request at the end of the study.

**What kind of questions will the questionnaire include?**

Questions such as the following are included in the questionnaire:

I think I will receive a good grade in this class

I think I will be able to use what I learn in the language class in other courses

I ask myself questions to make sure I know the material I have been studying

### **Ethical approval**

This study has been designed based on the strict Ethical Standards and Guidelines of the British Educational Research Association and the British Psychological Society. This study has been approved by the Ethics Committee at the Faculty of Education, University of Cambridge, UK.

### **Who is running the study?**

The principal lead researcher is Mr Ioannis Katsantonis. Ioannis is currently a full-time PhD student in Psychology of Education at Cambridge University. He holds an MPhil in Psychology and Education with distinction from Cambridge University, UK, and a Bachelor's degree in Education.

**If you are happy for your child to participate, then please fill in and sign the consent form attached. If you have any questions, then please do not hesitate to contact the lead researcher at [-----] or by phone at [-----], or, alternatively, his principal supervisor at [-----].**

Many thanks for considering participating in this study!

Kind regards,

Mr Ioannis Katsantonis

PhD student in Psychology of Education

### GREEK VERSION

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**Ενημερωτικό φυλλάδιο έρευνας με ερωτηματολόγιο**

**[Έκδοση γονέα/κηδεμόνα]**

Αγαπητέ Γονέα/κηδεμόνα,

**Τίτλος μελέτης:** Αυτοαποτελεσματικότητα και διαδικασίες αυτορρύθμισης στις σχολικές επιδόσεις: Συγκριτική μελέτη

**Περιγραφή μελέτης**

Σας ευχαριστώ πολύ για το ενδιαφέρον σας να συμμετάσχετε σε αυτή τη μελέτη. Αυτή η μελέτη αποτελεί μέρος του προγράμματος διδακτορικών μου σπουδών και έχει ως στόχο να εξετάσει τις σχέσεις μεταξύ της αυτοαποτελεσματικότητας των μαθητών (σιγουριά για την επίδοση), τα κίνητρα (μάθηση για την απόκτηση ικανοτήτων, την απόλαυση και ενδιαφέρον για μάθηση), την αυτορρύθμιση (στρατηγικές μάθησης) και την επίδοση στο

μάθημα της γλώσσας. Στο εν λόγω πρόγραμμα σπουδών μου, εξετάζω και τον τρόπο με τον οποίο σχετίζονται αυτές οι έννοιες.

### **Η συμμετοχή σας μετράει**

Δεν υπάρχουν πολλές μελέτες οι οποίες εξετάζουν τις σχέσεις μεταξύ της αυτοαποτελεσματικότητας, των κίνητρων και τις στρατηγικές μάθησης. Αυτή η μελέτη θα μπορούσε να μας βοηθήσει να βελτιώσουμε το τρέχον πρόγραμμα σπουδών των σχολείων και να κατανοήσουμε εάν και γιατί υπάρχουν διαφορές στα κίνητρα και τις επιδόσεις. Τα πορίσματα θα μπορούσαν επίσης να αποδειχθούν χρήσιμα για τη βελτίωση της μάθησης των μαθητών, δεδομένου ότι μπορεί να οδηγήσουν στη δημιουργία νέων κατευθυντήριων γραμμών για τη διδασκαλία. Επιπλέον, το σχολείο σας θα επωφεληθεί από αυτή τη μελέτη, δεδομένου ότι θα διεξαχθεί δωρεάν εργαστήριο για την κατάρτιση του προσωπικού ενώ θα μπορέσει να λάβει και αντίγραφο της έκθεσης των συγκεντρωτικών πορισμάτων κατόπιν αιτήματος.

### **Τι συνεπάγεται η συμμετοχή σε αυτή τη μελέτη;**

Τα παιδιά θα συμμετάσχουν σε αυτή τη μελέτη συμπληρώνοντας ένα ερωτηματολόγιο σχετικά με την αυτοαποτελεσματικότητα, τα κίνητρα, τις στρατηγικές μάθησης και τις επιδόσεις στο μάθημα της γλώσσας. Το ερωτηματολόγιο θα συμπληρωθεί κατά τη διάρκεια του μαθήματος, υπό την επίβλεψη του δασκάλου του παιδιού σας. Εκτιμάται ότι χρειάζονται περίπου 15 λεπτά για τη συμπλήρωση του ερωτηματολογίου.

### **Πώς αντιμετωπίζουμε τα θέματα εμπιστευτικότητας;**

Το ερωτηματολόγιο είναι εντελώς ανώνυμο και δεν απαιτεί ευαίσθητα ή εμπιστευτικά δεδομένα. Η συμμετοχή σε αυτή τη μελέτη/έρευνα θα γίνει με ομάδες και, ως εκ τούτου, διασφαλίζεται η ανωνυμία των απαντήσεων. Οι απαντήσεις του παιδιού σας θα παραμείνουν εμπιστευτικές. Να είστε βέβαιοι ότι *μόνον* ο επικεφαλής ερευνητής και οι συνεργάτες του θα έχουν πρόσβαση στα ανώνυμα δεδομένα. Οι εκπαιδευτικοί και το σχολείο δεν θα έχουν πρόσβαση στις απαντήσεις του παιδιού σας στο ερωτηματολόγιο. Τα δεδομένα θα αποθηκεύονται σε υπολογιστή προστατευμένο με κωδικό πρόσβασης και δεν θα είναι προσβάσιμα σε οποιονδήποτε δεν συμμετέχει στο έργο.

### **Πώς θα χρησιμοποιηθούν οι απαντήσεις του παιδιού;**

Οι απαντήσεις του παιδιού σας θα *συνδυαστούν* με εκείνες άλλων μαθητών και θα χρησιμοποιηθούν στη διδακτορική διατριβή, σε δημοσιεύσεις και παρουσιάσεις των τελικών πορισμάτων. Αντίγραφο των *συνδυαστικών* πορισμάτων θα τεθεί στη διάθεσή σας κατόπιν αιτήματος στο τέλος της μελέτης.

### **Τι είδους ερωτήσεις περιλαμβάνει το ερωτηματολόγιο;**

Στο ερωτηματολόγιο περιλαμβάνονται ερωτήσεις όπως οι ακόλουθες:

Νομίζω ότι θα πάρω έναν καλό βαθμό σε αυτό το μάθημα.

Νομίζω ότι θα είμαι σε θέση να χρησιμοποιήσω ό, τι μαθαίνω σε αυτό το μάθημα σε άλλα μαθήματα

Κάνω στον εαυτό μου ερωτήσεις για να σιγουρευτώ ότι γνωρίζω την ύλη την οποία μελετώ

### **Έγκριση με βάση τους ηθικούς/δεοντολογικούς κανόνες**

Η μελέτη αυτή έχει σχεδιαστεί με βάση τα αυστηρά Ηθικά/Δεοντολογικά Πρότυπα και Οδηγίες της Βρετανικής Ένωσης Εκπαιδευτικής Έρευνας και της Βρετανικής Ψυχολογικής Εταιρείας. Αυτή η μελέτη έχει εγκριθεί από την Επιτροπή Δεοντολογίας της Σχολής Επιστημών της Εκπαίδευσης του Πανεπιστημίου του Κέμπριτζ, Ηνωμένο Βασίλειο.

### **Ποιος διεξάγει τη μελέτη;**

Κύριος ερευνητής είναι ο Ιωάννης Κατσαντώνης. Ο Ιωάννης είναι επί του παρόντος διδακτορικός φοιτητής πλήρους φοίτησης στην Ψυχολογία της Εκπαίδευσης στο

Πανεπιστήμιο του Κέιμπριτζ. Είναι κάτοχος μεταπτυχιακού τίτλου στην Ψυχολογία και την Εκπαίδευση (με βαθμό άριστα) από το Πανεπιστήμιο του Κέιμπριτζ του Ηνωμένου Βασιλείου και κάτοχος προπτυχιακού τίτλου στην Εκπαίδευση.

**Εάν επιθυμείτε να συμμετάσχει το παιδί σας, παρακαλούμε συμπληρώστε και υπογράψτε το συνημμένο έντυπο συγκατάθεσης. Εάν έχετε οποιοσδήποτε ερωτήσεις, μη διστάσετε να επικοινωνήσετε με τον επικεφαλής ερευνητή στη διεύθυνση [-----] ή τηλεφωνικά στο [-----], ή με την επιβλέπουσα καθηγήτρια στη διεύθυνση [-----].**

Σας ευχαριστώ πολύ για τη συμμετοχή σας σε αυτή τη μελέτη!

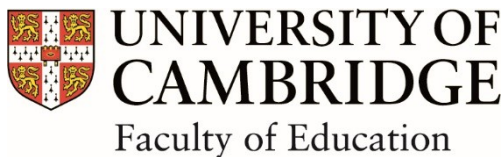
Με φιλικούς χαιρετισμούς,

Κος Ιωάννης Κατσαντώνης

Υποψήφιος διδάκτωρ στην Ψυχολογία της Εκπαίδευσης

## CONSENT FORM

---



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### Parent/Carer Consent Form

#### [Survey]

**Study title:** Self-efficacy and self-regulatory processes in academic achievement: A comparative study

**Principal lead:** Mr Ioannis Katsantonis, MPhil(Cambridge), B.Ed(Hons)

Please make a note (✓ or x) as appropriate.

I confirm that I am aware that this research has been approved by the *Ethics Committee* of the *Faculty of Education, University of Cambridge, UK*

I confirm that I have been *informed* about the *purposes* of this research study

I confirm that I am *aware* of my *right* to *withdraw* my child from this study at any time.

I confirm that I *understand* that any information provided by my child will be *anonymous* and *confidential*.

I confirm that I understand that my child's *anonymised* responses may be used in the PhD dissertation and/ or in publications and/ or presentations of the findings.

I confirm that I am aware that this study is carried out by Mr. Ioannis Katsantonis, a PhD student at the Faculty of Education, University of Cambridge, UK.

In case you have questions, you may contact Ioannis Katsantonis [-----] and/ or his principal supervisor [-----].

Fully informed of my rights, I consent my child to participate in this research

Parent's/ Carer's name: \_\_\_\_\_

Parent's/ Carer's signature name: \_\_\_\_\_

---

GREEK VERSION- SURVEY CONSENT FORM



**UNIVERSITY OF  
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Σχολή Επιστημών της Εκπαίδευσης]

Έντυπο συγκατάθεσης γονέα/κηδεμόνα

[Έρευνα Επισκόπησης]

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Κατανοώ ότι αυτή η έρευνα έχει εγκριθεί από την *Επιτροπή Δεοντολογίας της Σχολής Επιστημών της Εκπαίδευσης του Πανεπιστημίου του Κέιμπριτζ, Ηνωμένο Βασίλειο.*

Έχω ενημερωθεί για τους σκοπούς αυτής της ερευνητικής μελέτης

Γνωρίζω το δικαίωμά μου να αποσύρω τη συμμετοχή του παιδιού μου από αυτή τη μελέτη ανά πάσα στιγμή.

Κατανοώ ότι όλες οι πληροφορίες που παρέχονται από το παιδί μου θα είναι ανώνυμες και εμπιστευτικές.

Κατανοώ ότι οι ανώνυμες απαντήσεις του παιδιού μου μπορούν να χρησιμοποιηθούν στη διδακτορική διατριβή ή/και σε δημοσιεύσεις ή/και παρουσιάσεις των πορισμάτων.

Γνωρίζω ότι τα δεδομένα θα αποθηκευτούν σε έναν υπολογιστή προστατευμένο με κωδικό πρόσβασης.

Γνωρίζω ότι αυτή η μελέτη πραγματοποιείται από τον κύριο Ιωάννη Κατσαντώνη, υποψήφιο διδάκτορα στη Σχολή Επιστημών της Εκπαίδευσης του Πανεπιστημίου του Κέιμπριτζ, Ηνωμένο Βασίλειο.

Σε περίπτωση που έχετε ερωτήσεις, μπορείτε να επικοινωνήσετε με τον Ιωάννη

Κατσαντώνη [-----] ή/και με επιβλέπουσα καθηγήτρια, [-----].

Αφού ενημερώθηκα πλήρως για τα δικαιώματά μου, παρέχω τη συγκατάθεσή μου ώστε να συμμετάσχει το παιδί μου σε αυτή την έρευνα.

Όνομα γονέα/κηδεμόνα: \_\_\_\_\_

Υπογραφή γονέα/κηδεμόνα: \_\_\_\_\_

#### INTERVIEW- CONSENT FORM



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#### Parent/Carer Consent Form

##### [Interview]

**Study title:** Self-efficacy and self-regulatory processes in academic achievement: A comparative study

**Principal lead:** Mr Ioannis Katsantonis, MPhil(Cambridge), B.Ed(Hons)

I confirm that I am aware that this research has been approved by the *Ethics Committee* of the *Faculty of Education, University of Cambridge, UK*

I confirm that I have been informed about the purposes of this research study

I confirm that I *allow* the lead researcher to record the audio of my child's responses

during the one-to-one discussion

I confirm that I am *aware* of my *right* to *withdraw* my child from this study at any time.

I confirm that I *understand* that any information provided by my child will be *anonymous* and *confidential*.

I confirm that I understand that my child's *anonymised* responses may be used in the PhD dissertation and/ or in publications and/ or presentations of the findings.

I confirm that I am aware that the data will be stored in a password protected PC.

I confirm that I am aware that this study is carried out by Mr. Ioannis Katsantonis, a PhD student at the Faculty of Education, University of Cambridge, UK.

In case you have questions, you may contact Ioannis Katsantonis [-----] and/ or his principal supervisor, [-----].

Fully informed of my rights, I consent my child to participate in this research

Parent's/ Carer's name: \_\_\_\_\_

Parent's/ Carer's signature name: \_\_\_\_\_

#### GREEK VERSION- INTERVIEW INFORMATION AND CONSENT FORM



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#### Ενημερωτικό φυλλάδιο συνέντευξης

#### [Έκδοση γονέα/κηδεμόνα]

Αγαπητέ γονέα/κηδεμόνα,

**Τίτλος μελέτης:** Αυτοαποτελεσματικότητα και διαδικασίες αυτορρύθμισης στις σχολικές επιδόσεις: Συγκριτική μελέτη

#### **Περιγραφή μελέτης**

Αυτή η μελέτη αποτελεί μέρος του προγράμματος διδακτορικών μου σπουδών και έχει ως στόχο να εξετάσει τις σχέσεις μεταξύ της αυτοαποτελεσματικότητας των μαθητών (σιγουριά για την επίδοση), τα κίνητρα (μάθηση για την απόκτηση ικανοτήτων, την απόλαυση και ενδιαφέρον για μάθηση), την αυτορρύθμιση (στρατηγικές μάθησης) και την επίδοση στο μάθημα της γλώσσας. Στο εν λόγω πρόγραμμα σπουδών μου, εξετάζω και τον τρόπο με τον οποίο σχετίζονται αυτές οι έννοιες.

#### **Η συμμετοχή σας μετράει**

Δεν υπάρχουν πολλές μελέτες οι οποίες εξετάζουν τις σχέσεις μεταξύ της αυτοαποτελεσματικότητας, των κινήτρων και τις στρατηγικές μάθησης. Αυτή η μελέτη θα μπορούσε να μας βοηθήσει να βελτιώσουμε το τρέχον πρόγραμμα σπουδών των σχολείων και να κατανοήσουμε εάν και γιατί υπάρχουν διαφορές στα κίνητρα και τις επιδόσεις. Τα πορίσματα θα μπορούσαν επίσης να αποδειχθούν χρήσιμα για τη βελτίωση της μάθησης των μαθητών, δεδομένου ότι μπορεί να οδηγήσουν στη δημιουργία νέων κατευθυντήριων γραμμών για τη διδασκαλία. Επιπλέον, το σχολείο σας θα επωφεληθεί από αυτή τη μελέτη, δεδομένου ότι θα διεξαχθεί δωρεάν εργαστήριο για την κατάρτιση του προσωπικού ενώ θα

μπορέσει να λάβει και αντίγραφο της έκθεσης των συγκεντρωτικών πορισμάτων κατόπιν αιτήματος.

**Τι συνεπάγεται η συμμετοχή σε αυτή τη συνέντευξη;**

Τα νεαρά παιδιά θα συμμετάσχουν σε μια σύντομη συζήτηση σχετικά με την αυτοαποτελεσματικότητα, τα κίνητρα, τις στρατηγικές μάθησης και τις επιδόσεις στο μάθημα της γλώσσας. Η συζήτηση θα πραγματοποιηθεί κατά τη διάρκεια των μαθημάτων ή μετά το σχολείο, ανάλογα με την προτίμησή σας. Εκτιμάται ότι χρειάζονται περίπου 20 λεπτά για να ολοκληρωθεί. Μπορείτε να αποσύρετε ανά πάσα στιγμή τη συμμετοχή σας ή τη συμμετοχή του παιδιού σας από την έρευνα.

**Πώς αντιμετωπίζουμε τα θέματα εμπιστευτικότητας;**

Οι ηχογραφήσεις της συνέντευξης θα είναι εντελώς ανώνυμες. Οι απαντήσεις των νεαρών παιδιών θα παραμείνουν εμπιστευτικές. Να είστε βέβαιοι ότι **μόνον** ο επικεφαλής ερευνητής και οι συνεργάτες του θα έχουν πρόσβαση στα ανώνυμα δεδομένα. Οι εκπαιδευτικοί και το σχολείο δεν θα έχουν πρόσβαση στις απαντήσεις των νεαρών παιδιών στο ερωτηματολόγιο.

**Πώς θα χρησιμοποιηθούν οι απαντήσεις των νεαρών παιδιών;**

Με την άδειά σας, οι απαντήσεις του παιδιού σας θα ηχογραφηθούν. Στη συνέχεια, θα εξαγάγω ορισμένες βασικές ιδέες και αυτές θα χρησιμοποιηθούν στη διδακτορική διατριβή, σε δημοσιεύσεις και σε παρουσιάσεις των τελικών πορισμάτων. Αντίγραφο των συνδυαστικών πορισμάτων θα τεθεί στη διάθεσή σας κατόπιν αιτήματος στο τέλος της μελέτης.

**Τι είδους ερωτήσεις περιλαμβάνει η συνέντευξη;**

Στη συνέντευξη περιλαμβάνονται ερωτήματα όπως τα ακόλουθα:

Πόσο σίγουρος/η νιώθεις ότι μπορείς να τα πας καλά στο μάθημα της γλώσσας;

Γιατί είναι σημαντικό για εσένα να παίρνεις καλούς βαθμούς στο μάθημα της γλώσσας;

Αν οι φίλοι σου σε καλούν να συναντηθείτε έξω ή να παίξετε ένα online παιχνίδι μαζί τους και δεν έχεις ολοκληρώσει την εργασία σου, τι θα έκανες;

**Έγκριση με βάση τους ηθικούς/δεοντολογικούς κανόνες**

Η μελέτη αυτή έχει σχεδιαστεί με βάση τα αυστηρά Ηθικά/Δεοντολογικά Πρότυπα και Οδηγίες της Βρετανικής Ένωσης Εκπαιδευτικής Έρευνας και της Βρετανικής Ψυχολογικής Εταιρείας. Αυτή η μελέτη έχει εγκριθεί από την Επιτροπή Δεοντολογίας της Σχολής Επιστημών της Εκπαίδευσης του Πανεπιστημίου του Κέιμπριτζ, Ηνωμένο Βασίλειο.

**Ποιος διεξάγει τη μελέτη;**

Κύριος ερευνητής είναι ο Ιωάννης Κατσαντώνης. Ο Ιωάννης είναι επί του παρόντος διδακτορικός φοιτητής πλήρους φοίτησης στην Ψυχολογία της Εκπαίδευσης στο Πανεπιστήμιο του Κέιμπριτζ. Είναι κάτοχος μεταπτυχιακού τίτλου στην Ψυχολογία και την Εκπαίδευση (με βαθμό άριστα) από το Πανεπιστήμιο του Κέιμπριτζ του Ηνωμένου Βασιλείου και κάτοχος προπτυχιακού τίτλου στην Εκπαίδευση.

**Εάν επιθυμείτε να συμμετάσχει το παιδί σας, παρακαλούμε συμπληρώστε και υπογράψτε το συνημμένο έντυπο συγκατάθεσης. Εάν έχετε οποιοσδήποτε ερωτήσεις, μη διστάσετε να επικοινωνήσετε με τον επικεφαλής ερευνητή στη διεύθυνση [-----] ή τηλεφωνικά στο [-----], ή με την επιβλέπουσα καθηγήτρια στη διεύθυνση [-----].**

Σας ευχαριστώ πολύ για τη συμμετοχή σας σε αυτή τη μελέτη!

Με φιλικούς χαιρετισμούς,

Κος Ιωάννης Κατσαντώνης

Υποψήφιος διδάκτωρ στην Ψυχολογία της Εκπαίδευσης

## INTERVIEW CONSENT FORM



**UNIVERSITY OF  
CAMBRIDGE**  
Faculty of Education

184 Hills Rd, Cambridge CB2 8PQ  
Tel: +44(0) 01223 767600  
[Graduate@educ.cam.ac.uk](mailto:Graduate@educ.cam.ac.uk)  
[www.educ.cam.ac.uk](http://www.educ.cam.ac.uk)

**Parent/Carer Consent Form****[Interview]**

**Study title:** Self-efficacy and self-regulatory processes in academic achievement: A comparative study

**Principal lead:** Mr Ioannis Katsantonis, MPhil(Cambridge), B.Ed(Hons)

I confirm that I am aware that this research has been approved by the *Ethics Committee* of the *Faculty of Education, University of Cambridge, UK*

I confirm that I have been *informed* about the *purposes* of this research study

I confirm that I *allow* the lead researcher to record the audio of my child's responses during the one-to-one discussion

I confirm that I am *aware* of my *right* to *withdraw* my child from this study at any time.

I confirm that I *understand* that any information provided by my child will be *anonymous* and *confidential*.

I confirm that I understand that my child's *anonymised* responses may be used in the PhD dissertation and/ or in publications and/ or presentations of the findings.

I confirm that I am aware that the data will be stored in a password protected PC.

I confirm that I am aware that this study is carried out by Mr. Ioannis Katsantonis, a PhD student at the Faculty of Education, University of Cambridge, UK.

In case you have questions, you may contact Ioannis Katsantonis [-----] and/ or his principal supervisor, [-----].

Fully informed of my rights, I consent my child to participate in this research

Parent's/ Carer's name: \_\_\_\_\_

Parent's/ Carer's signature name: \_\_\_\_\_

## GREEK VERSION OF CONSENT FORM- INTERVIEW



**UNIVERSITY OF  
CAMBRIDGE**  
Faculty of Education

[ΠΑΝΕΠΙΣΤΗΜΙΟ ΤΟΥ ΚΕΙΜΠΡΙΤΖ

Σχολή Επιστημών της Εκπαίδευσης]

**Έντυπο συγκατάθεσης γονέα/κηδεμόνα**

**[Συνέντευξη]**

**Τίτλος μελέτης:** Αυτοαποτελεσματικότητα και διαδικασίες αυτορρύθμισης στις σχολικές επιδόσεις: Συγκριτική μελέτη

**Επικεφαλής ερευνητής:** Κος Ιωάννης Κατσαντώνης, MPhil(Cambridge), B.Ed(Hons)

Διεύθυνση: 184 Hills Rd, Cambridge  
CB2 8PQ  
Τηλ.: + 44(0) 01223 767600  
[-----]  
[www.educ.cam.ac.uk](http://www.educ.cam.ac.uk)

Κατανοώ ότι αυτή η έρευνα έχει εγκριθεί από την *Επιτροπή Δεοντολογίας της Σχολής Επιστημών της Εκπαίδευσης του Πανεπιστημίου του Κέιμπριτζ, Ηνωμένο Βασίλειο.*

Έχω ενημερωθεί για τους σκοπούς αυτής της ερευνητικής μελέτης

*Επιτρέπω* στον επικεφαλής ερευνητή να ηχογραφήσει τις απαντήσεις του παιδιού μου κατά τη διάρκεια μιας κατ' ιδίαν συζήτησης

*Γνωρίζω* το δικαίωμά μου να αποσύρω τη συμμετοχή του παιδιού μου από αυτή τη μελέτη ανά πάσα στιγμή.

Κατανοώ ότι όλες οι πληροφορίες που παρέχονται από το παιδί μου θα είναι ανώνυμες και εμπιστευτικές.

Κατανοώ ότι οι ανώνυμες απαντήσεις του παιδιού μου μπορούν να χρησιμοποιηθούν στη διδακτορική διατριβή ή/και σε δημοσιεύσεις ή/και παρουσιάσεις των πορισμάτων.

Γνωρίζω ότι τα δεδομένα θα αποθηκευτούν σε έναν υπολογιστή προστατευμένο με κωδικό πρόσβασης.

Γνωρίζω ότι αυτή η μελέτη πραγματοποιείται από τον κύριο Ιωάννη Κατσαντώνη, διδακτορικό φοιτητή στη Σχολή Επιστημών της Εκπαίδευσης του Πανεπιστημίου του Κέιμπριτζ, Ηνωμένο Βασίλειο.

Σε περίπτωση που έχετε ερωτήσεις, μπορείτε να επικοινωνήσετε με τον Ιωάννη Κατσαντώνη [-----] ή/και με την επιβλέπουσα καθηγήτρια, [-----].

Αφού ενημερώθηκα πλήρως για τα δικαιώματά μου, παρέχω τη συγκατάθεσή μου ώστε να συμμετάσχει το παιδί μου σε αυτή την έρευνα.

Όνομα γονέα/κηδεμόνα: \_\_\_\_\_

Υπογραφή γονέα/κηδεμόνα: \_\_\_\_\_

Email γονέα/κηδεμόνα: \_\_\_\_\_

## Appendix B- Ministry of Education Approval [In Greek]



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ  
ΥΠΟΥΡΓΕΙΟ  
ΠΑΙΔΕΙΑΣ ΚΑΙ ΘΡΗΣΚΕΥΜΑΤΩΝ

ΓΕΝΙΚΗ ΓΡΑΜΜΑΤΕΙΑ  
ΠΡΩΤΟΒΑΘΜΙΑΣ, ΔΕΥΤΕΡΟΒΑΘΜΙΑΣ  
ΕΚΠΑΙΔΕΥΣΗΣ ΚΑΙ ΕΙΔΙΚΗΣ ΑΓΩΓΗΣ  
ΓΕΝΙΚΗ ΔΙΕΥΘΥΝΣΗ ΣΠΟΥΔΩΝ  
Π/ΘΜΙΑΣ ΚΑΙ Δ/ΘΜΙΑΣ ΕΚΠΑΙΔΕΥΣΗΣ  
ΔΙΕΥΘΥΝΣΗ ΣΠΟΥΔΩΝ, ΠΡΟΓΡΑΜΜΑΤΩΝ ΚΑΙ  
ΟΡΓΑΝΩΣΗΣ Δ/ΘΜΙΑΣ ΕΚΠ/ΣΗΣ  
ΤΜΗΜΑ Α'

-----  
Ταχ. Δ/ση: Ανδρέα Παπανδρέου 37  
Τ.Κ. – Πόλη: 15180 Μαρούσι  
Ιστοσελίδα: [www.minedu.gov.gr](http://www.minedu.gov.gr)  
Πληροφορίες: Αν. Πασχαλίδου  
Μ. Γόγολα  
Τηλέφωνο: 210-3443422  
210-3442240

Anastasia Paschalidou  
24.11.2022 10:03:42

Βαθμός Ασφαλείας:  
Να διατηρηθεί μέχρι:  
Βαθμ. Προτεραιότητας:

Αθήνα, 23-11-2022  
Αρ. Πρωτ. 145640/Δ2

ΠΡΟΣ:

- κ. Ιωάννη Κασσαντώνη
- Διευθύνσεις Δ/θμιας Εκπ/σης Α', Β', Γ' και Δ' Αθήνας, Δυτικής Αττικής, Αιτωλοακαρνανίας, Αχαΐας και Ηλείας

#### ΘΕΜΑ: Έγκριση διεξαγωγής έρευνας

- Σχετ.: 1. Το με αρ. πρωτ. εισ. Υ.ΠΑΙ.Θ. 140311/Δ2/11-11-2022 έγγραφο  
2. Η υπό στοιχεία 1614/Υ1/08-01-2020 Απόφαση της Υπουργού και των Υφυπουργών Παιδείας και Θρησκευμάτων (Β' 8)

Απαντώντας σε σχετική αίτηση και μετά τη γνωμοδότηση του Ινστιτούτου Εκπαιδευτικής Πολιτικής (**πράξη 60/10-11-2022 του Δ.Σ.**), σας γνωρίζουμε ότι **επιτρέπουμε** τη διεξαγωγή έρευνας από τον κ. **Ιωάννη Κασσαντώνη**, κατά τη διάρκεια του σχολικού έτους **2022-2023**, με τις εξής προϋποθέσεις:

α) Πριν από την έναρξη της έρευνας να γίνει ενημέρωση του Διευθυντή και του Συλλόγου Διδασκόντων των σχολικών μονάδων Δευτεροβάθμιας Εκπαίδευσης, οι οποίες θα συμμετάσχουν στην έρευνα, σχετικά με τη διαδικασία διεξαγωγής της.

β) Η έρευνα να πραγματοποιηθεί με τη σύμφωνη γνώμη του Συλλόγου Διδασκόντων.

γ) Η έρευνα να γίνει με την έγγραφη συγκατάθεση των γονέων/κηδεμόνων των μαθητών/-τριών (για κάθε μαθητή/-ήτρια χωριστά). Ο Διευθυντής του σχολείου θα αποστείλει στους γονείς/κηδεμόνες προς συμπλήρωση το έντυπο γονικής συναίνεσης που θα του κατατεθεί από τον ερευνητή και στο οποίο θα περιγράφονται οι σκοποί, το περιεχόμενο και η μεθοδολογία της έρευνας. Στη συνέχεια, και αφού συγκεντρώσει τα ενυπόγραφα σημειώματα με τη συγκατάθεση των γονέων/κηδεμόνων, μπορεί να επιτρέψει τη διεξαγωγή της έρευνας.

δ) Οι μαθητές/-ήτριες να συμπληρώσουν τα ερωτηματολόγια **ανώνυμα** και εφόσον το επιθυμούν, με την παρουσία του εκπαιδευτικού της τάξης.

ε) Οι μαθητές/-ήτριες να συμμετάσχουν στις ημιδομημένες συνεντεύξεις **ανώνυμα** και εφόσον το επιθυμούν, με την παρουσία εκπαιδευτικού της σχολικής μονάδας.

στ) Η απασχόληση των μαθητών για την υλοποίηση της έρευνας να μην υπερβαίνει τις **δύο (02) διδακτικές ώρες**. Εφόσον απαιτηθεί περισσότερος χρόνος, η έρευνα να συνεχιστεί εκτός ωρολογίου προγράμματος, σε χώρο και χρόνο που θα καθορισθεί από τον Διευθυντή του σχολείου σε συνεργασία με τον ερευνητή και με την ενυπόγραφη σύμφωνη γνώμη των γονέων/κηδεμόνων των μαθητών/-τριών.

ζ) Η ηχογράφηση των μαθητών/-τριών να γίνει αποκλειστικά για τις ανάγκες της συγκεκριμένης έρευνας και τα σχετικά αρχεία, μετά το πέρας της έρευνας, να καταστραφούν (το αργότερο εντός εξαμήνου από την ολοκλήρωση της έρευνας). Τα αρχεία της ηχογράφησης να μην χρησιμοποιηθούν για κανέναν άλλο σκοπό, παρά μόνο για τις ανάγκες συλλογής και ανάλυσης των ερευνητικών δεδομένων. Σε καμία περίπτωση να μην επιχειρηθεί δημόσια χρήση των ακουστικών προϊόντων στο σύνολό τους ή έστω τμήματος αυτών, στο πλαίσιο οποιασδήποτε ερευνητικής ή ακαδημαϊκής δραστηριότητας της ερευνήτριας. Την απόλυτη και αποκλειστική ευθύνη για τη φύλαξη, τη διαχείριση και την καταστροφή των εν λόγω αρχείων φέρει ο υπεύθυνος ερευνητής, ο οποίος οφείλει να διασφαλίσει την ανωνυμία των συμμετεχόντων και του σχολείου.

η) Κατά τη διάρκεια διεξαγωγής της έρευνας, να μη γίνεται χρήση κανενός μέσου καταγραφής εικόνας και κίνησης.

θ) Να διασφαλίζεται η προστασία των συμμετεχόντων/-ουσών από την έκθεση σε σωματικό ή ψυχολογικό κίνδυνο, ή ταλαιπωρία ή άλλες δυσμενείς για τους/τις ίδιους/ίδιες επιπτώσεις στο πλαίσιο συμμετοχής τους στην ερευνητική διαδικασία.

ι) Να δίνεται η δυνατότητα των συμμετεχόντων/-ουσών στην έρευνα να διατηρούν το δικαίωμα της άρνησης συμμετοχής και απόσυρσης από την έρευνα ανά πάσα στιγμή και για οποιοδήποτε λόγο, χωρίς καμία συνέπεια.

ια) Να μην διατυπώνονται, σε καμία περίπτωση, αξιολογικές κρίσεις και διαγνωστικά συμπεράσματα στους/στις συμμετέχοντες/-ουσες ή στους γονείς/κηδεμόνες τους.

ιβ) Η υλοποίηση της έρευνας στα σχολεία να πραγματοποιείται χωρίς διανομή ή προβολή οποιουδήποτε διαφημιστικού υλικού.

ιγ) Όλες οι πληροφορίες που θα συλλεχθούν κατά τη διάρκεια της έρευνας να διατηρηθούν εμπιστευτικές και η συλλογή των ερευνητικών δεδομένων να πραγματοποιείται βάσει της κείμενης νομοθεσίας περί προστασίας των προσωπικών δεδομένων (Ν. 4624/2019).

ιδ) Οι προσωπικές πληροφορίες και τα δημογραφικά στοιχεία να αποθηκευτούν ξεχωριστά από τις απαντήσεις των ερωτηματολογίων και οποιοδήποτε στοιχείο ταυτοποίησης να καταστραφεί με την ολοκλήρωση της επεξεργασίας των δεδομένων της έρευνας. Μόνο οι υπεύθυνοι ερευνητές να έχουν πρόσβαση στα ερευνητικά δεδομένα.

**Επισημαίνεται ότι η συμμετοχή στην έρευνα δεν είναι υποχρεωτική.**

Η έρευνα έχει θέμα: «**Αυτοαποτελεσματικότητα/Αυτεπάρκεια και διαδικασίες αυτορρύθμισης στις σχολικές επιδόσεις: Συγκριτική μελέτη (self-efficacy and self-regulatory processes in academic achievement: A comparative study)**»

και απευθύνεται σε μαθητές/-ήτριες των σχολικών μονάδων του συνημμένου πίνακα.

Για την πραγματοποίηση της έρευνας θα πρέπει:

1. Οι επισκέψεις του ερευνητή στα σχολεία να γίνουν μετά από συνεννόηση με τον Διευθυντή και σε συνεργασία με τον σύλλογο καθηγητών των σχολείων, ώστε να μη διαταράσσεται η εύρυθμη λειτουργία των σχολικών μονάδων.

2. Κατά τις επισκέψεις στα σχολεία, να τηρούνται αυστηρά και κατά προτεραιότητα τα οριζόμενα στις εκάστοτε Κοινές Υπουργικές Αποφάσεις ή/και εγκυκλίου του Υ.ΠΑΙ.Θ. που αφορούν στα μέτρα ασφαλούς λειτουργίας των εκπαιδευτικών μονάδων.

3. Μετά την ολοκλήρωση της έρευνας, να αποσταλεί ηλεκτρονικό αντίτυπο της ερευνητικής εργασίας στο πρωτόκολλο του Ινστιτούτου Εκπαιδευτικής Πολιτικής (info@iep.edu.gr), καθώς επίσης και ενυπόγραφη, σύμφωνη ή όχι, γνώμη του ερευνητή για το εάν επιτρέπει στο Ι.Ε.Π. να προβεί σε ηλεκτρονική ανάρτηση της ερευνητικής εργασίας.

4. Οι Διευθυντές των Δ/νσεων Δ/θμιας Εκπ/σης Α', Β', Γ' και Δ' Αθήνας, Δυτικής Αττικής, Αιτωλοακαρνανίας, Αχαΐας και Ηλείας να ενημερώσουν τους Διευθυντές των σχολικών μονάδων αρμοδιότητάς τους, ώστε να διευκολύνουν τον ενδιαφερόμενο στην πραγματοποίηση της έρευνας αυτής σύμφωνα με τα παραπάνω.

**Ο ΓΕΝΙΚΟΣ ΓΡΑΜΜΑΤΕΑΣ Π/ΘΜΙΑΣ,  
Δ/ΘΜΙΑΣ ΕΚΠ/ΣΗΣ  
ΚΑΙ ΕΙΔΙΚΗΣ ΑΓΩΓΗΣ**

**ΑΛΕΞΑΝΔΡΟΣ ΚΟΠΤΣΗΣ**

**Συνημ.**: Ένα (01) ηλεκτρονικό αρχείο

**Εσωτ. Διανομή**  
Δ/νση Σπουδών, Προγρ/των & Οργάνωσης Δ.Ε., Τμ. Α'

**ΑΚΡΙΒΕΣ ΑΝΤΙΓΡΑΦΟ**

Appendix C- PISA motivational and teachers' feedback scales (Study 1)

---

Measures' Item Wordings

Item Wordings for PISA 2015 Scales (OECD, 2016a)

Science Self-Efficacy Scale

How easy do you think it would be for you to perform the following tasks on your own?

- 
1. recognise the science question that underlies a newspaper report on a health issue

---

  2. explain why earthquakes occur more frequently in some areas than in others

---

  3. describe the role of antibiotics in the treatment of disease

---

  4. identify the science question associated with the disposal of garbage

---

  5. predict how changes to an environment will affect the survival of certain species

---

  6. interpret the scientific information provided on the labelling of food items

---

  7. discuss how new evidence can lead you to change your understanding about the possibility of life on Mars

---

  8. identify the better of two explanations for the formation of acid rain

---

Intrinsic Motivation- Interest in Science

To what extent are you interested in the following <broad science> topics?

- 
1. Biosphere (e.g. Ecosystem services, sustainability)

---

  2. Motion and forces (e.g. Velocity, friction, magnetic and gravitational forces)

---

  3. Energy and its transformation (e.g. Conservation, chemical reactions)

---

  4. The Universe and its history

---

  5. How science can help us prevent disease

---

Intrinsic Motivation- Enjoyment of Science

How much do you disagree or agree with the statements about yourself below?

- 
1. I generally have fun when I am learning <broad science> topics

---

  2. I like reading about <broad science>

---

  3. I am happy working on <broad science> topics

---

  4. I enjoy acquiring new knowledge in <broad science>

---

  5. I am interested in learning about <broad science>

---

Achievement Motivation- Performance-Approach Goal Orientation

To what extent do you disagree or agree with the following statements about yourself?

- 
1. I want top grades in most or all of my courses

---

  2. I want to be able to select from among the best opportunities available when I graduate

---

---

3. I want to be the best, whatever I do

---

4. I see myself as an ambitious person

---

5. I want to be one of the best students in my class

---

### Instrumental Motivation- Extrinsic Motivation

How much do you agree with the statements below?

---

1. Making an effort in my <school science> subject(s) is worth it because this will help me in the work I want to do later on

---

2. What I learn in my <school science> subject(s) is important for me because I need this for what I want to do later on

---

3. Studying my <school science> subject(s) is worthwhile for me because what I learn will improve my career prospects

---

4. Many things I learn in my <school science> subject(s) will help me to get a job

---

### Teachers' Feedback Practices

How often do these things happen in your lessons for this <school science> course?

---

1. The teacher tells me how I am performing in this course

---

2. The teacher gives me feedback on my strengths in this <school science> subject

---

3. The teacher tells me in which areas I can still improve

---

---

4. The teacher tells me how I can improve my performance

---

5. The teacher advises me on how to reach my learning goals

---

---

Appendix D- Questionnaire for person-centred quantitative Study 2

---

**Motivated Strategies for Learning Questionnaire** (Pintrich et al., 1991)

The following questionnaire contains some questions regarding your self-confidence in the subject of **Modern Greek Language**, your motivations for learning, and the strategies you use to better understand this subject. The questionnaire is anonymous, and there are no right or wrong answers. Please respond as honestly as you can - your parents, classmates, and teachers will not see your answers.

Please mark with **x** in the box according to whether you agree or disagree with the following statements. 1 corresponds to "Not applicable at all for me," and 7 corresponds to "Very applicable to me. You can choose any number between 1 and 7.

**S1 Table. Academic self-efficacy in school language class**

- 
1. Compared with other students in this **class** I expect to do well
  2. I'm certain I can understand the ideas taught in this course
  3. I expect to do very well in this class
  4. Compared with others in this class, I think I'm a good student
  5. I am sure I can do an excellent job on the problems and tasks assigned for this class
  6. I think I will receive a good grade in this class
  7. My study skills are excellent compared with others in this class
  8. Compared with other students in this class I think I know a great deal about
-

---

the subject

9. I know that I will be able to learn the material for this class

---

Class was substituted with modern Greek language class throughout the questionnaire. The word “course” was changed to modern Greek language class throughout for consistency purposes.

**S2 Table. Mastery Goals- Intrinsic Goals**

- 
1. In a class like this, I prefer course material that really challenges me so I can learn new things
  2. In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn
  3. The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible
  4. When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade
- 

**S3 Table. Performance Goals- Extrinsic Goals**

- 
1. Getting a good grade in this class is the most satisfying thing for me right now
- 
2. The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade
-

---

3. If I can, I want to get better grades in this class than most of the other students

---

4. I want to do well in this class because it is important to show my ability to my family, friends, future employer, or others.

---

**S4 Table. Intrinsic motivation**

- 
1. I am very interested in the content area of this course
  2. I like the subject matter of this course
- 

**S5 Table. Extrinsic motivation**

- 
1. I think I will be able to use what I learn in this class in other courses
  2. It is important for me to learn the course material in this class
  3. I think the course material in this class is useful for me to learn
  4. Understanding the subject matter of this course is important for me
- 

**S6 Table. Metacognitive self-regulation**

- 
1. I ask myself questions to make sure I know the material I have been studying
  2. I work on practice exercises and answer end of chapter questions even when I don't have to.
  3. Even when study materials are dull and uninteresting, I keep working until I
-

---

finish

4. Before I begin studying, I think about the things I will need to do to learn
5. When I'm reading, I stop once in a while and go over what I have read
6. I work hard to get a good grade even when I don't like a class

---

Note: Three items from the original scale were dropped from the analyses due to low latent factor loadings even after reverse-scoring due to negative item wordings.

### **S7 Supporting Information. Further measures**

#### **Achievement Score in Language**

- Please circle your most recent grade in modern Greek language class

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

#### **Demographic Information**

- How would you describe your gender?

Male  (1) Female  (0) Other

- What school grade are you currently in?

A' Gymnasium  (0) B' Gymnasium  (1) C' Gymnasium  (2) A' Lyceum

- How old are you?

13  14  15  16

- Imagine that this ladder pictures how GREEK society is set up. At the top of the ladder are the people who are the best off — they have the most money, the highest amount of schooling, and the jobs that bring the most respect. At the bottom are people who are the worst off — they have the

least money, little or no education, no job, or jobs that no one wants or respects. Now think about your family. Please tell us where you think your family would be on this ladder. Mark the rung that best represents where your family would be on this ladder.



- Is Greek the language you speak at home with your family?

Yes  (1)      No  (0)

#### GREEK VERSION

	1	2	3	4	5	6	7
Σε σύγκριση με άλλους/ες μαθητές/μαθήτριες σε αυτό το <b>μάθημα</b> , αναμένω να τα καταφέρω.							
Είμαι βέβαιος/η ότι μπορώ να κατανοήσω τις έννοιες που διδάσκονται σε αυτό το μάθημα.							
Αναμένω να έχω πολύ καλή επίδοση σε αυτό το μάθημα.							
Σε σύγκριση με άλλους σε αυτό το μάθημα, νομίζω ότι							

είμαι καλός/ή μαθητής/μαθήτρια.							
Είμαι βέβαιος/η ότι μπορώ να ανταποκριθώ εξαιρετικά στα προβλήματα και στις εργασίες που ανατίθενται σε αυτό το μάθημα.							
Νομίζω ότι θα πάρω έναν καλό βαθμό σε αυτό το μάθημα.							
Οι δεξιότητες μελέτης μου είναι εξαιρετικές σε σύγκριση με τους υπολοίπους σε αυτό το μάθημα.							
Σε σύγκριση με άλλους μαθητές/μαθήτριες σε αυτό το μάθημα νομίζω ότι γνωρίζω πολλά για το θέμα/μάθημα.							
Ξέρω ότι θα μπορέσω να μάθω την ύλη αυτού του μαθήματος.							

	1	2	3	4	5	6	7
Σε ένα μάθημα όπως αυτό, προτιμώ υλικό διδασκαλίας το οποίο με προκαλεί πραγματικά, ώστε να μπορώ να μάθω νέα πράγματα.							
Σε ένα μάθημα όπως αυτό, προτιμώ υλικό διδασκαλίας το οποίο διεγείρει την περιέργειά μου, ακόμα και αν είναι δύσκολο να το μάθω.							

Το πιο ικανοποιητικό πράγμα για μένα σε αυτό το μάθημα είναι να προσπαθώ να κατανοήσω το περιεχόμενο όσο το δυνατόν πιο διεξοδικά.							
Όταν έχω την ευκαιρία σε αυτό το μάθημα, επιλέγω εργασίες από τις οποίες μπορώ να μάθω ακόμα και αν δεν μου εγγυώνται έναν καλό βαθμό.							

	1	2	3	4	5	6	7
Το να πάρω έναν καλό βαθμό σε αυτό το μάθημα είναι το πιο ικανοποιητικό πράγμα για μένα αυτή τη στιγμή.							
Το πιο σημαντικό πράγμα για μένα αυτή τη στιγμή είναι η βελτίωση του συνολικού μέσου όρου βαθμολογίας μου, οπότε κύρια έγνοια μου σε αυτό το μάθημα είναι να πάρω έναν καλό βαθμό.							
Αν μπορέσω, θέλω να πάρω καλύτερο βαθμό σε αυτό το μάθημα σε σχέση με τους/τις περισσότερους/ες από τους υπόλοιπους μαθητές/μαθήτριες.							
Θέλω να τα πάω καλά σε αυτό το μάθημα, επειδή είναι σημαντικό να αποδείξω την ικανότητά μου στην οικογένεια, τους φίλους, τον/την μελλοντικό εργοδότη/-τριά μου ή άλλους.							

	1	2	3	4	5	6	7
--	---	---	---	---	---	---	---

Νομίζω ότι θα είμαι σε θέση να χρησιμοποιήσω ό, τι μαθαίνω σε αυτό το μάθημα και σε άλλα μαθήματα.							
Είναι σημαντικό για μένα να μάθω το υλικό διδασκαλίας αυτού του μαθήματος.							
Ενδιαφέρομαι πολύ για το περιεχόμενο αυτού του μαθήματος.							
Νομίζω ότι το υλικό διδασκαλίας αυτού του μαθήματος είναι χρήσιμο για μένα.							
Μου αρέσει η θεματολογία αυτού του μαθήματος.							
Η κατανόηση της θεματολογίας αυτού του μαθήματος είναι σημαντική για μένα.							

	1	2	3	4	5	6	7
Κάνω στον εαυτό μου ερωτήσεις για να σιγουρευτώ ότι γνωρίζω την ύλη την οποία μελετώ.							
Όταν η μελέτη είναι απαιτητική, είτε εγκαταλείπω είτε μελετώ μόνο τα εύκολα μέρη.							
Κάνω ασκήσεις για εξάσκηση και απαντώ σε ερωτήσεις στο τέλος του κεφαλαίου, ακόμα και όταν δεν χρειάζεται να το κάνω.							

Ακόμη και όταν το αντικείμενο της εργασίας είναι βαρετό και αδιάφορο, συνεχίζω να μελετώ μέχρι να τελειώσω.							
Πριν αρχίσω να διαβάζω, σκέφτομαι τα πράγματα που πρέπει να κάνω για να μάθω.							
Συχνά διαπιστώνω ότι έχω διαβάσει για το μάθημα, αλλά δεν κατανοώ περί τίνος πρόκειται.							
Διαπιστώνω ότι όταν ο δάσκαλος μιλάει, σκέφτομαι άλλα πράγματα και δεν ακούω πραγματικά αυτά που λέγονται.							
Όταν διαβάζω, σταματάω μια στο τόσο και αναλογίζομαι ό,τι έχω διαβάσει.							
Διαβάζω πολύ για να πάρω καλό βαθμό ακόμη και όταν δεν μου αρέσει ένα μάθημα.							

### Βαθμολογία στο μάθημα της Νεοελληνικής Γλώσσας/ Έκθεσης

- Κύκλωσε τον πιο πρόσφατο βαθμό σου στο μάθημα της Νεοελληνικής Γλώσσας/Έκθεσης (στρογγυλοποίησε τα δεκαδικά).

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18  
19 20

- Αν μπορούσες να επιλέξεις μόνος/η τον βαθμό σου στο μάθημα της Νεοελληνικής Γλώσσας/Έκθεσης, τι θα επέλεγες; Κύκλωσε ανάλογα.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18  
19 20

- Πώς θα χαρακτήριζες την επίδοσή σου στο μάθημα της γλώσσας;

Καλή  Μέτρια  Κακή

**Μερικά στοιχεία για εσένα**

- Πώς θα περιέγραφες το φύλο σου;

Άρρεν (αγόρι)       Θήλυ (κορίτσι)       Προτιμώ να μην αναφέρω

- Πόσο χρονών είσαι;

12     13     14     15     16

- Σε ποια τάξη φοιτάς;

Α' Γυμνασίου     Β' Γυμνασίου     Γ' Γυμνασίου     Α' Λυκείου

- Φαντάσου ότι αυτή η σκάλα απεικονίζει το πώς είναι διαμορφωμένη η **ΕΛΛΗΝΙΚΗ ΚΟΙΝΩΝΙΑ**. Στην κορυφή της σκάλας βρίσκονται οι άνθρωποι που είναι πιο προνομιούχοι: έχουν περισσότερα χρήματα, υψηλότερο επίπεδο εκπαίδευσης και κατέχουν θέσεις εργασίας οι οποίες χαίρουν του μεγαλύτερου σεβασμού. Στο κάτω μέρος βρίσκονται οι άνθρωποι που δεν είναι προνομιούχοι: έχουν λιγότερα χρήματα, διαθέτουν χαμηλό ή κανένα επίπεδο εκπαίδευσης, είναι άνεργοι ή εργάζονται σε θέσεις εργασίας τις οποίες κανείς δεν επιθυμεί ή σέβεται. Τώρα σκέψου την οικογένειά σου. Πες μας πού νομίζεις ότι θα βρισκόταν σε αυτή τη σκάλα η οικογένειά σου. Σημείωσε το σκαλοπάτι που ανταποκρίνεται σε μεγαλύτερο βαθμό στο σημείο όπου θα βρισκόταν η οικογένειά σου σε αυτή τη σκάλα.



- Είναι τα ελληνικά η γλώσσα που μιλάτε στο σπίτι με την οικογένειά σου;

Ναι       Όχι

**Σε ευχαριστώ πολύ!**



Appendix E- Interview protocol for qualitative study (Study 3)

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ENTRY PHASE

*SECTION 1: Contextual Factors (teachers, parents, normative comparisons)*

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Questions

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- How confident are you in this subject?
- How do you learn how you are progressing in the language class?
- How do you feel during the language lessons and the classes?
- How does your teacher support you when you are asked to complete a task during your language class?

IF your teacher doesn't give you any support, why do you think your teacher does not offer you any support sometimes?

- What do your parents think about your progress and grades in language class?
- Compared to your classmates, how do you think you are performing in language class?
- What is your opinion in general about performance and grading?

*SECTION 2: Motivation & SRL Strategies*

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Questions

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- Why is it important for you to get good grades in language class?
  - Why do you complete your homework/assignments for your language class, if you
-

---

do so?

IF you do not complete your homework/assignments, please tell me why you do not do so.

Imagine now that your teacher assigned you homework to read a text and write a 200-word summary that you have to hand in next time.

- How would you make sure that you'll remember the most important information in the text?
- Let's assume that you don't know some words in the text, what would you do?
- Now imagine you completely understand the text. How will you prepare to write your summary?
- After you have written your summary, what will do next to make sure that it's the best it can be?
- If your sibling(s)/parent(s)/caregiver(s) make noise in the living room and do not allow you to concentrate on your assignment, what would you do?
- Let's suppose that you find this assignment/homework boring. What would you do if it was boring?
- If your friends call you to meet outside or play an online game with them and you haven't finished your assignment, what would you do?

---

### *SECTION 3: Background Questions*

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#### Questions

---

- 
- In what subject do you think you are the best and what is your weakest subject?
  - When you think about your future after graduating from secondary school, what kind of job do you want to do?
  - Is Greek the language you speak mainly at home?
  - How would you describe your overall/average grade in school? Do you think you are a high or a low achiever?
- 

#### CLOSING PHASE

The student is thanked for participating and answering the questions. The student is asked if there is any further information, he/she/they wish(es) to share. The student is informed that he/she/they is/are free to ask the interviewer any questions. The interviewer bids the student farewell.

#### GREEK VERSION

##### *ΤΜΗΜΑ 1: Αυτοαποτελεσματικότητα & Πρακτικές των Εκπαιδευτικών*

Θέμα	Διατύπωση ερωτήσεων
1. Σιγουριά στο μάθημα της γλώσσας	➤ Πόσο σίγουρος/η νιώθεις σε αυτό το μάθημα;
2. Συναισθήματα που σχετίζονται με το μάθημα	➤ Πώς αισθάνεσαι κατά τη διάρκεια του μαθήματος της γλώσσας;
3. Ανατροφοδότηση των καθηγητών σχετικά με την πρόοδο στο μάθημα της γλώσσας	➤ Πώς μαθαίνεις για την πρόοδό σου στο μάθημα της γλώσσας;
4. Αντιλήψεις για την υποστήριξη	➤ Πώς σε υποστηρίζει ο δάσκαλός

των εκπαιδευτικών στην τάξη	<p>σας όταν σου ζητείται να ολοκληρώσεις μια εργασία κατά τη διάρκεια του μαθήματος της γλώσσας;</p> <p>Εάν ο δάσκαλός σου δεν σου παρέχει καμία υποστήριξη, γιατί πιστεύεις ότι συμβαίνει αυτό;</p>
5. Γονείς και επίδοση στο μάθημα της γλώσσας	<p>➤ Ποια είναι η γνώμη των γονιών σου για την πρόδό σου και τους βαθμούς σου στο μάθημα της γλώσσας;</p>
6. Αξιολόγηση ικανότητας στο μάθημα της γλώσσας & σε σύγκριση με τους συμμαθητές/συμμαθήτριες	<p>➤ Σε σύγκριση με τους/τις συμμαθητές/συμμαθήτριές σου, πώς πιστεύεις ότι τα «πηγαίνεις» στο μάθημα της γλώσσας;</p>

## ΤΜΗΜΑ 2: Κίνητρα & Στρατηγικές αυτορρυθμιζόμενης μάθησης

Θέμα	Διατύπωση ερωτήσεων
1. Κίνητρα: Αντικειμενικοί προσανατολισμοί & εσωτερικά κίνητρα	<p>➤ Ποια είναι η γνώμη σου για την επίδοση και τη βαθμολογία, γενικά;</p> <p>➤ Γιατί είναι σημαντικό για εσένα να παίρνεις καλούς βαθμούς στο μάθημα της γλώσσας;</p> <p>➤ Γιατί ολοκληρώνεις τις εργασίες/αναθέσεις σου στο μάθημα της γλώσσας;</p>
2. Στρατηγικές αυτορρυθμιζόμενης μάθησης	<p>Φαντάσου τώρα ότι ο δάσκαλός σου ανέθεσε ως εργασία για το σπίτι να διαβάσεις ένα κείμενο σχετικά με την κλιματική αλλαγή και να γράψεις μια περίληψη 200 λέξεων.</p> <p>➤ Πώς θα διασφαλίσεις ότι θα θυμάσαι τις πιο σημαντικές πληροφορίες του κειμένου;</p> <p>➤ Ας υποθέσουμε ότι δεν</p>

γνωρίζεις κάποιες λέξεις στο κείμενο, τι θα έκανες;

- Τώρα φαντάσου ότι κατανοείς πλήρως το κείμενο, πώς θα προετοιμαστείς για να γράψεις την περίληψή σου;
- Αφού έχεις γράψει την περίληψή σου, τι θα κάνεις στη συνέχεια για να βεβαιωθείς ότι είναι η καλύτερη δυνατή;
- Εάν τα αδέρφια/οι γονείς σου κάνουν θόρυβο στο σαλόνι και δεν σου επιτρέπουν να συγκεντρωθείς στην εργασία σου, τι θα έκανες;
- Ας υποθέσουμε ότι θεωρείς βαρετή αυτή την εργασία για το σπίτι. Τι θα έκανες αν ήταν βαρετή;
- Αν οι φίλοι σου σε καλούν να συναντηθείτε έξω ή να παίξετε ένα online παιχνίδι μαζί τους και δεν έχεις ολοκληρώσει την εργασία σου, τι θα έκανες;

### ΤΜΗΜΑ 3: Ερωτήσεις σχετικές με το υπόβαθρο

Θέμα	Διατύπωση ερωτήσεων
1. Καλύτερη και χειρότερη επίδοση σε μάθημα	➤ Σε ποιο μάθημα θεωρείς ότι έχεις την καλύτερη επίδοση και σε ποιο τη χειρότερη;
2. Μελλοντικός επαγγελματικός προγραμματισμός	➤ Όταν σκέφτεσαι το μέλλον σου μετά την αποφοίτησή σου από το λύκειο, τι είδους δουλειά θα ήθελες να κάνεις;
3. Ελληνικά ως μητρική γλώσσα	➤ Είναι η αγγλική/ελληνική η γλώσσα που μιλάτε στο σπίτι;
4. Συνολική σχολική επίδοση	➤ Πώς θα περιέγραφες τη συνολική βαθμολογία/μέσο όρο

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σου στο σχολείο; Θεωρείς ότι  
είναι υψηλή ή χαμηλή;

---

#### ΤΕΛΙΚΗ ΦΑΣΗ

Ευχαριστώ τους μαθητές για τη συμμετοχή και τις απαντήσεις τους. Ρωτάω τους μαθητές αν υπάρχει κάποια επιπλέον πληροφορία που θα ήθελαν να μοιραστούν μαζί μου. Οι μαθητές ενημερώνονται ότι είναι ελεύθεροι να με ρωτήσουν οτιδήποτε θέλουν. Αποχαιρετώ τους μαθητές