



Academic Self-Concept

Formation, Development, and Long-Term Outcomes

Thea Klapp



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Abstract

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This thesis investigates academic self-concept, defined as students' perceptions of their academic ability. Academic self-concept is an important construct in educational psychology, both as an outcome of students' academic experiences and as a predictor of later educational and life outcomes. Although previous research has shown that academic self-concept is related to achievement, motivation, educational choices, and attainment, questions remain regarding how it is formed, how it develops during adolescence, and how it is associated with outcomes beyond the educational system.

The overall aim of the thesis was to broaden knowledge about the formation, development, and long-term associations of academic self-concept. The thesis comprises three empirical studies based on Swedish longitudinal data from the Evaluation Through Follow-up study. Study I examined the development of mathematics and English self-concepts from Grade 6 to Grade 12 and extended the internal/external frame-of-reference model using latent growth curve analysis. Study II investigated the big-fish–little-pond effect in mathematics and Swedish and examined whether individual cognitive ability moderated the relationship between school-average achievement and students' subject-specific self-concepts. Study III examined the long-term association between general academic self-concept in Grade 6 and registered income in adulthood, while accounting for achievement, track affiliation, cognitive ability, gender, and parental education.

The findings showed that academic self-concepts were related to multiple comparison processes. In Study I, mathematics and English self-concepts followed

different developmental patterns during adolescence, and internal and external comparisons were more clearly related to the development of mathematics self-concept than English self-concept. In Study II, school-average achievement was negatively related to students' subject-specific self-concepts, in line with the big-fish–little-pond effect. The results also provided partial support for the bright-student hypothesis, as cognitive ability moderated the effect in mathematics but not in Swedish. In Study III, general academic self-concept in Grade 6 was positively associated with income in adulthood, even after accounting for academic and background factors.

Taken together, the thesis contributes to research on academic self-concept by showing how students' self-perceptions are related to internal, external, and social comparison processes, how they develop differently across subject domains, and how early academic self-concept is associated with long-term outcomes beyond the educational system.

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Chapter 1 Introduction

1.1 Academic Self-Concept: Relevance and Formation

This thesis investigates academic self-concept, defined as students' perceptions of their academic competence, in the Swedish educational context. The research presented here aims to improve our understanding of how academic self-concept forms and develops during adolescence, and how it is associated with outcomes in adulthood. Students' beliefs about their academic competence do not merely reflect their academic achievement; they are also related to a number of other factors, including previous academic experiences, the composition of peers, individual characteristics, and instructional practices in school (Bong & Skaalvik, 2003; Marsh et al., 2017, 2024). Within the field of educational research, academic self-concept and related concepts have been the subject of extensive study, both as a predictor of later outcomes, such as achievement, and as outcomes in themselves. The Swedish educational context has undergone changes in relation to grading, national testing, school choice, and school segregation. These features are relevant for understanding academic self-concept, as they concern the achievement information students receive and the reference groups against which they may evaluate their academic ability.

As a predictor, students' academic self-concepts have been found to be a meaningful factor for subsequent cognitive and non-cognitive outcomes. In their book on competence and motivation, psychologists Elliot and Dweck (2005) described self-perception of competency as a basic psychological function and need that impacts individuals' daily lives, cognition, and behaviour. More specifically, many studies conducted over the past decades have highlighted that competency perceptions, such as self-concept, play a key role in students' educational journeys (S.-K. Chen et al., 2013; J.-P. Guo et al., 2022; Marsh et al., 2022; Marsh & Craven, 2006; Marsh & Yeung, 1997a, 1997b). When students believe in their abilities and potential, they are more likely to engage in their studies (J.-P. Guo et al., 2022; Skaalvik & Rankin, 1995), set ambitious goals (Skaalvik, 1997), and be driven by intrinsic values (Gottfried, 1990; Mac Iver et al., 1991). Moreover, when students perceive their competencies positively in a given subject,

they tend to perform better in the subject (Arens et al., 2017; Hübner et al., 2023), seek further courses in the subject (Nagy et al., 2006), and pursue and complete higher education in the subject (J. Guo et al., 2015; Lazarides et al., 2020; Marsh & O'Mara, 2008). Thus, an individual's academic self-concept in compulsory school appears to be related to both short-term and long-term outcomes. One example is the gender difference in mathematics self-concept. While girls and boys may perform equally well in mathematics, girls tend to rate their mathematics abilities significantly lower than boys (Frenzel et al., 2007; Holm et al., 2020; Nagy et al., 2006). These gender differences in self-concept may be associated with subsequent gender differences in mathematics-related educational pathways and career choices (Jiang et al., 2020). Thus, academic self-concept can explain subsequent outcomes that cannot be explained by previous academic performance or cognitive ability alone.

Due to its importance for educational outcomes, the formation of academic self-concept has received attention. Research has shown that academic self-concept in a given subject, such as mathematics, is formed based on evaluations made against several standards of comparison (Marsh, 1986; Marsh, Abduljabbar, Morin, et al., 2015; Shavelson et al., 1976). These standards include social or external comparisons (e.g., comparing one's ability with that of peers), dimensional or internal comparisons (e.g., comparing one's ability across subjects), temporal comparisons (e.g., comparing one's performance over time), and absolute comparisons (e.g., comparing a given test result with the maximum score) (Marsh et al., 2017). For example, when forming their self-concept in mathematics, students use information such as teacher-reported grades and test results in mathematics and other subjects, as well as the performance of their peers. Marsh et al. (2024) identified the three most well-established empirical theories that explain academic self-concept formation as the big-fish–little-pond effect (BFLPE), the internal/external (I/E) frame-of-reference model, and the reciprocal effects model (REM). Each of these models describes part of the formation process. Together, they provide a more complete picture of how social, dimensional, and temporal comparisons interact during the development of an academic self-concept. The *BFLPE* is based on social comparison theory and describes how social comparisons may have negative implications for students' academic self-concepts. The standard of comparison is tougher in high-achieving environments than in lower-achieving ones. This means that while individual achievement is positively related to academic self-concept, achievement aggregated to class- or school-level is negatively related to individual self-concept. Therefore,

two students with equal abilities in mathematics would have different self-concepts in mathematics depending on their school context. According to the BFLPE, the student in the higher-achieving school would have a lower mathematics self-concept compared to the student in the lower-achieving school (Marsh et al., 2001). Extensive research has shown that the negative contextual relationship is stronger than the positive relationship on individual level (see, for example, Basarkod et al., 2023; Marsh, Abduljabbar, Morin, et al., 2015; Televantou et al., 2021). The *I/E model* describes how academic self-concept is formed within and between subjects by combining explanations of internal and external comparisons, also known as dimensional and social comparisons (Marsh, 1986). High achievement in mathematics is associated with a high self-concept in mathematics, but a low self-concept in verbal subjects. Similarly, high achievement in a verbal subject is associated with a high verbal self-concept and a low mathematics self-concept. Therefore, a student may perform very well in both subjects, yet have a different perception of her abilities in each subject, depending on factors such as the average level of achievement in each class (Arens & Niepel, 2023; Marsh, Abduljabbar, Parker, et al., 2015). Consequently, academic self-concept tends to be less correlated across subjects than achievement. This reflects a subject-specific differentiation in self-concept, enabling the development of academic identities, such as *'I am good at maths, not language'*, or vice versa. The REM describes the reciprocal nature of the relationship between academic achievement and self-concept within a subject over time (Marsh et al., 2005). Mathematics achievement is positively associated with subsequent mathematics self-concept, which is positively associated with subsequent mathematics achievement. This model exemplifies that a student's academic self-concept is formed by temporal comparisons against prior achievement within the same subject. In other words, students use past feedback information, such as grades, to inform their current self-concept (Arens et al., 2017). These empirical theories demonstrate that students' academic self-concepts are shaped by various forms of academic achievement simultaneously, rather than merely reflecting their ability.

1.2 Research Gaps

Although much is known about how academic self-concept forms and relates to other educational factors, there are some questions concerning the formation processes that we know less about. For example, the BFLPE is generally accepted to affect all students similarly, regardless of individual factors like gender or

achievement (Marsh et al., 2008). However, some studies have indicated that there may be differences in BFLPE depending on individual achievement, where the highest-achieving students are less affected by the negative contextual effect than lower-achieving students (X. Chen, 2022; Marsh et al., 2009; Trautwein et al., 2009). This is known as the bright-student hypothesis. Results of other studies have suggested contradictory or non-significant moderation effects (Marsh et al., 2021; Seaton et al., 2009). If there are differences in how students relate to school-average achievement, it may be an indication that social comparison processes differ across students. Furthermore, little attention has been given to the question of how academic self-concepts develop over time within students in relation to their academic achievement. Studies using longitudinal data and autoregressive cross-lagged approaches have shown that academic achievement and self-concept are positively interrelated over time within subjects and negatively interrelated across subjects (see, for example, Arens & Niepel, 2023; Möller et al., 2011). However, less is known about the stability of formation processes and the development of academic self-concepts in students during adolescence. Adolescence is a period when students receive more achievement information and when subject-specific self-concepts tend to become more crystallised. Knowledge on the development of subject-specific self-concepts during this period may provide insights into subsequent pathways.

The formation and development of academic self-concept are particularly important to investigate in the contemporary Swedish educational context. Earlier grading and more frequent national testing in recent cohorts provide students with achievement-related feedback earlier in schooling, while free school choice and increased achievement differences between schools may have shaped the reference groups and school contexts against which students evaluate their ability. Much of the empirical research cited in the thesis was based on data from school systems with more explicit forms of differentiation, selection, or between-school stratification (Dicke et al., 2018; Fang et al., 2018; Marsh et al., 2000, 2009; Parker et al., 2015; Televantou et al., 2021). The Swedish educational context therefore provides an opportunity to investigate these questions in a somewhat different setting. Compulsory schooling has historically been organised as a largely comprehensive system, but recent changes related to assessment, school choice, and between-school differences may be relevant for students' academic self-concepts.

In addition to uncertainties relating to the formation process of academic self-concept, there are also uncertainties regarding its implications. We know that there

are long-term associations between early adolescent academic self-concept and subsequent educational outcomes, such as achievement and educational attainment, but we know less about its association with factors outside of education. If there is an association between academic self-concept and income in adulthood, academic self-concept may be relevant beyond the educational sphere.

1.3 Research Aims and Contributions

Against this background, the overall objective of the present thesis was to broaden knowledge of academic self-concept by exploring questions related to its formation and development in students during adolescence, as well as its long-term associations with outcomes in adulthood. Addressing these questions contributes to expanding the empirical knowledge of how academic self-concept forms and develops over time through social and dimensional comparisons. The overarching research questions guiding the thesis were:

1. How do subject-specific academic self-concepts form and develop in relation to internal, external, and social comparison processes?
2. How is general academic self-concept in compulsory school associated with outcomes in adulthood?

The objectives of the thesis were investigated through three empirical studies. The specific purpose and contribution of each sub-study are presented below.

The aim of Study I was to empirically extend the classic I/E model in order to explore the developmental trajectories of mathematics and English self-concepts during adolescence. This made it possible to examine whether internal and external comparisons are related to the developmental trajectories of mathematics and English self-concepts in ways that go beyond the more static explanation of the classic I/E model and the autoregressive cross-lagged I/E model. Previous studies using this methodological approach to examine the I/E model are limited in number. One such study was conducted by Parker et al. (2015), who found evidence of longitudinal associations between achievement and self-concept within subjects (external comparisons), but not between subjects (internal comparisons). The results of Study I provide further insight into the development of mathematics and English self-concept formation over time.

The aim of Study II was to empirically extend the BFLPE in the domains of mathematics and Swedish by investigating the bright-student hypothesis using a measure of individual cognitive ability. Providing empirical evidence of the moderating role of cognitive ability in the BFLPE across the mathematics and

Swedish domains furthers the discussion on whether individual factors, such as cognitive ability, may buffer the negative relationship between school-average achievement and academic self-concept.

The aim of Study III was to investigate the long-term association between academic self-concept in compulsory school and income in adulthood after accounting for track affiliation in English and mathematics in Grade 9. This study was conducted with data on individuals born in 1972, who went through lower secondary school during a period of track differentiation in selected subjects. Previous studies on long-term associations have mainly investigated the relationships between academic self-concept and outcomes relating to education. Building on this, Study III extends this line of research by examining whether academic self-concept in compulsory school is associated with later income, used as a proxy for economic attainment.

1.4 Outline of the Thesis

In the following chapter, Chapter 2, the Swedish educational contexts relevant to the thesis are discussed and accounted for. It provides a brief overview of the education system from 1962 to the present day. In Chapter 3, theories and concepts are described and discussed, including the definition of academic self-concept and the theories behind its formation. This is followed by an account of the current research field in Chapter 4, in which research on academic self-concept formation and relations to other factors are presented. In Chapter 5, methodological questions of data handling, measurements, and analysis methods are addressed. In Chapter 6, the results of the thesis are presented and discussed. Finally, Chapter 7 presents some concluding remarks, including methodological limitations, policy and practical implications, and directions for future research. The seven chapters are followed by a Swedish overview of the thesis. In the very end of the thesis, the three studies are presented.

Table 1. Overview of Studies I-III

	Study I	Study II	Study III
Title	Longitudinal Extension of the Internal/External Model: Growth Development of Mathematics and English Self-Concept during Adolescence	Big-Fish-Little-Pond Effects on Ninth-Grade Students' Mathematics and Language Self-Concepts: The Moderating Role of Cognitive Ability	Academic Self-Concept and Tracking in Compulsory School: Associations with Income in Adulthood
Data	UGU: Cohort 2004	UGU: Cohorts 1992, 1998, 2004	UGU: Cohort 1972
Design	Longitudinal	Cross-sectional	Longitudinal observational
Method	Latent growth curve analysis	Multilevel modelling	Structural equation modelling
Objective	Self-concept development	Self-concept formation	Long-term implications

Note. Evaluation Through Follow-up (UGU)

Chapter 2 The Swedish Educational Context

The following chapter addresses the relevant aspects of the Swedish educational system in relation to the thesis. The chapter focuses specifically on the educational structures and reforms related to the achievement and comparison processes that are involved in the three studies. Understanding the context is important for the interpretation of each study.

2.1 Compulsory and Upper Secondary Schooling in Sweden

In Sweden, education is organised into compulsory and upper secondary schooling. Compulsory education has long comprised nine years of schooling (Grades 1–9). Since 2018, it comprises ten years of compulsory education (preschool class and Grades 1–9). Compulsory school is commonly divided into lower (Grades 1–3, ages 7–9), middle (Grades 4–6, ages 10–12), and lower secondary stages (Grades 7–9, ages 13–15). The nine-year compulsory school was introduced in 1962. After compulsory school, students may continue to upper secondary school. It is not compulsory and comprises three years of schooling (corresponding to Grades 10–12, ages 16–18). Although attendance is not compulsory, the vast majority of Swedish students continue to upper secondary school (Swedish National Agency for Education, n.d.). In total, the thesis involved data from Grades 6, 9, and 12. Study I involved all three of these grades, Study II involved Grades 6 and 9, and Study III involved Grades 6 and 9, as well as adult income.

2.2 Achievement, Grading, and Differentiation

Track differentiation was implemented in mathematics and English in secondary school (Grades 7–9) in 1962. This remained in place until the curriculum for the compulsory school system was introduced in 1994. The track differentiation system meant that students attended either the advanced or general track in mathematics and English within their school. The motivation behind

implementing track differentiation was to facilitate teaching and provide students with different levels of achievement with better opportunities to learn and succeed in two particularly difficult subjects (Marklund, 1985). The advanced tracks were designed for higher-achieving students, while the general tracks were designed for lower-achieving students (Swedish Government, 1988). Students could choose which track to join, and they could change track between school years. This context is relevant for Study III, which was based on a sample of students born in 1972. Track affiliation in mathematics and English was included in the study.

In 1994, new curricula were implemented in Swedish compulsory and upper secondary schools. The 1994 compulsory school curriculum changed the grading system from relative to criterion-referenced, in which students were graded according to nationally established criteria (Grundskoleförordning, 1994). A new grading scale was also introduced: pass, pass with distinction, and pass with special distinction. Students who did not reach the learning objectives for a subject received no grade for that subject. Students were graded from Grade 8 onwards. The 1994 upper secondary school curriculum was constructed similarly, except that students could obtain a Fail grade (Grundskoleförordning, 1994).

A further reform was implemented in the Swedish education system in 2011. Around this time, a number of changes relating to grades and national tests were introduced in compulsory education. Grades were introduced earlier in the school system, in Grade 6 instead of in Grade 8. In addition, national tests were introduced in Grades 3, 6, and 9 instead of Grades 5 and 9 (National Agency for Education, 2015). The grading scale introduced in 1994 was replaced with a 6-point scale ranging from F to A. The steps taken towards a Fail grade in 1994 were thus fully realised in 2011, when the Fail grade was implemented alongside the new grading scale. Lastly, stricter entry requirements for upper secondary school were introduced. To be eligible, students needed to achieve a passing grade in eight or twelve subjects (depending on whether they applied for a vocational or higher-education preparatory programme), rather than achieving a passing grade in Swedish, English, and mathematics (National Agency for Education, 2015).

The 1994 and 2011 reform contexts are relevant for Studies I and II in different ways. Study I was based on data from students who experienced the 2011 context, while Study II was based on multiple cohorts of students, some of whom experienced the 1994 context and some the 2011 context. Grades and national test results are both a part of the achievement feedback that may provide students with information about their abilities. Students' grading and test context is therefore relevant when studying academic self-concept formation.

2.3 School Choice, School Segregation, and Peer Contexts

Traditionally, the Swedish school model has been based on the welfare state model, in which centralised governance and political decision-making played a key role (Lindblad, 2011). However, in the late 20th century, schools in Sweden, as in many other countries, became increasingly market-driven, with education reforms based on models of choice and competition (Levin, 2012). Freedom-of-choice reforms were introduced to the Swedish education system in the early 1990s. It has been argued that these reforms changed the nature of the system from a welfare model to a market model (Fjellman et al., 2019; Lundahl et al., 2013). Two central parts of these reforms were school choice and voucher-financed independent schools. Free school choice meant that parents and students could choose which school to attend, whether it was a municipal or independent school (National Agency for Education, 2012). The introduction of voucher-financed independent schools meant that independent schools became tax-financed despite being privately run (Wiborg, 2015).

Studies and reports conducted around 20 years after the freedom-of-choice reforms were implemented have found increased segregation between compulsory schools in terms of both achievement and socioeconomic background (Böhlmark et al., 2016; Lubienski, 2005; National Agency for Education, 2012; Yang Hansen & Gustafsson, 2016). This has led to a greater variation in achievement between Swedish schools, meaning that average achievement differed more between schools. This context is relevant to Study II as school-average achievement is a key component of the BFLPE. This variation in achievement between schools may provide students with different frames of reference, which may shape their academic self-evaluations.

2.4 Relevance of the Swedish Context for the Present Thesis

The 2011 reforms are relevant to Study I, which investigates changes in the academic self-concept of students born in 2004 across Grades 6, 9, and 12. For this cohort of students, this particular period was characterised by earlier grading and more frequent testing. School choice and between-school achievement differences are relevant to Study II's investigation of the BFLPE. The historical

context of track differentiation is relevant to Study III, which included Grade 9 track affiliation in mathematics and English. Together, these contextual characteristics make it possible to investigate academic self-concept in different educational settings. Analysing data from these periods allows the thesis to answer a variety of questions about academic self-concept, including how it is formed, how it develops, and how it is associated with long-term outcomes.

Chapter 3 Theoretical Underpinnings

In the field of educational psychology, perceived competencies are widely recognised as a key factor in academic success. They have been defined and measured in a number of different ways. Similar yet distinct constructs that address individuals' perceptions of their academic abilities include academic self-concept, self-efficacy, self-esteem, and self-confidence (Marsh et al., 2017). The objective of this thesis is to expand the empirical knowledge of academic self-concept. However, it will be defined here in contrast to the construct of academic self-efficacy, which is arguably the most similar construct. These two constructs are often considered to be interconnected (Bong & Skaalvik, 2003; Marsh et al., 2019), and their similarities and differences are the subjects of ongoing discussion. We will return to this topic below.

3.1 Academic Self-Concept

In one of the earlier seminal studies of academic self-concept, Shavelson et al. (1976, p. 411) provided the following definition:

In very broad terms, self-concept is a person's perception of himself. These perceptions are formed through his experience with his environment.

This definition still holds, and previous research has established that academic self-concepts indeed are formed partly through evaluations of past academic experiences and the school environment, such as the average achievement-level (Bong & Skaalvik, 2003; Marsh et al., 2019). In other words, our academic self-concepts are shaped by how we assess and perceive our environment, our academic experiences, and the feedback we receive. Teacher-reported grades are an example of the type of feedback that informs students' academic self-concepts. Because it is formed through assessments of past accomplishments, academic self-concept is generally considered to reflect retrospective perceptions. To some extent, this definition differs from the definition of academic self-efficacy. In a broad sense, academic self-efficacy may also be defined as perceived academic

abilities in school (Bong & Skaalvik, 2003). However, when scrutinized in more detail, the definition of academic self-efficacy differs from that of self-concept. Bandura (1986) defined academic self-efficacy as individuals' judgements of their ability to achieve specific tasks, meaning that self-efficacy concerns not ability itself, but what individuals believe they can accomplish. For this reason, self-efficacy is most often defined and constructed as a future-oriented measure (Marsh et al., 2019).

Because of the retrospective and general nature of self-concept, it has been suggested that it is formed through internal and external comparisons to a greater extent than self-efficacy (Marsh et al., 2019). A typical self-concept question, such as "Do you think that you are good at mathematics?" prompts the respondent to describe and evaluate their ability based not only on previous experience of the subject, but also on comparisons with peers and abilities across subjects (Bong & Clark, 1999). Therefore, self-concept involves both descriptive and evaluative aspects. Shavelson et al. (1976) note that the descriptive—or cognitive—aspect of an answer to a question such as the one mentioned above represents an individual's knowledge or belief about themselves. However, they also note that these beliefs also are the result of an evaluation. While it is difficult to empirically distinguish between the evaluative and descriptive aspects, the general consensus is that academic self-concept consists of more evaluative aspects than academic self-efficacy. A typical self-efficacy question might be phrased as follows: "How confident are you in your ability to successfully figure out how long it will take to travel from City A to City B driving at 55 mph?" (Betz & Hackett, 1983), or "How well can you learn algebra?" (Zimmerman et al., 1992). Traditionally, "pure" self-efficacy measures are constructed by giving students a test and asking them to rate how likely they are to answer each question correctly. They are then asked to answer the test questions (Bandura, 1986). Due to the future-oriented, task-specific, and descriptive nature of self-efficacy questions, it has been suggested that they do not invite comparisons with peers or comparisons between subjects to the same extent as self-concept questions (Bong & Clark, 1999; Bong & Skaalvik, 2003). This is supported by the results of previous research showing that purely descriptive self-efficacy constructs are not formed through internal and external comparisons (Marsh et al., 2019).

The similarities and differences of academic self-concept and self-efficacy have been debated, and the question of operationalisations has received particular attention. One example is the operationalisation of academic self-efficacy. In some studies, self-efficacy has been operationalised as a generalized measure rather than

a purely descriptive one, where the specific goal is not explicitly stated in the question. Generalized measures may have the typical self-efficacy characteristics but are phrased in a way that invokes internal and external comparisons to a higher extent than traditional self-efficacy items, such as “How well can you solve an equation in mathematics?” (Marsh et al., 2019). Regarding academic self-concept, many self-concept studies base their measurement operationalisations on the Self-Description Questionnaire (SDQ), constructed by Marsh (1990c). The SDQ instrument has been adapted to suit different ages and domains, both academic and non-academic. It incorporates cognitive components, such as “I learn things quickly in mathematics” and affective components, such as “I look forward to mathematics class”. The cognitive component tends to reflect students’ competence perceptions whereas the affective component reflects their emotional and motivational reactions (Arens et al., 2011). These self-concept components have been found to relate differently to educational outcomes. The cognitive component, for example, seems to be more strongly related to achievement and similar performance-based outcomes than the affective component (Arens et al., 2011; Choy & Yeung, 2022). The affective component, on the other hand, seems to be more strongly related to non-performance-based motivational outcomes than the cognitive component, such as educational and career aspirations (Choy & Yeung, 2022). Hence, similar to academic self-efficacy operationalisations, differences in operationalisation of academic self-concept may invoke different feelings and comparison frames for the responding students.

Marsh et al. (2019) investigated various measures of competency perceptions in the mathematics domain with a combination of academic self-concept and self-efficacy indicators. The measures included were academic self-concept, generalized academic self-efficacy, and purely descriptive, or test-related, academic self-efficacy. The results suggested that despite the otherwise typical self-efficacy traits of the generalized self-efficacy measure, it behaved similar to the self-concept measure. Both measures were related to class-average mathematics achievement, which indicated that the responses for both measures were influenced by social comparisons (i.e., the BFLPE). However, the test-related self-efficacy measure was not related to class-average achievement, indicating that these responses were not formed through social comparison. These results support the notion that the historic dichotomy between academic self-concept and self-efficacy in reality is more nuanced and dependent on specific operationalisations (Marsh et al., 2017).

To conclude, academic self-concept and self-efficacy have similar and different characteristics, which influence how they are formed. However, the differences in

how the constructs are formed seem to have more to do with how general the measures are, and less to do with construct-specific characteristics like whether questions are phrased retrospectively or future-oriented. In the next section, the multidimensionality of academic self-concepts is discussed.

3.2 The Multidimensionality of Academic Self-Concept

Traditionally, academic self-concept has been defined quite generally as individuals' perceived academic abilities. However, since the late 20th century, more specific definitions have become established (Marsh, 1990c; Shavelson et al., 1976). Shavelson et al. (1976) proposed a model of self-concept with a hierarchical structure. The general self-concept—or self-esteem—at the apex was divided into academic and non-academic self-concepts. The academic self-concept was then divided into domain-specific facets, such as mathematics and English self-concept. These facets were measured using subject-specific indicators. Marsh and Shavelson (1985) later modified this hypothetical model and some of the assumptions underlying it. Originally, Shavelson et al. (1976) assumed that self-concept would be highly correlated across subjects. However, when Marsh and Shavelson (1985) tested the model empirically, they found that the subject-specific facets of academic self-concept were independent of each other. Additionally, they found that the hierarchical structure of the global academic self-concept was prevalent primarily for younger ages, whereas the subject-specific facets of academic self-concept became more distinct as individuals got older. Figure 1 illustrates what the hierarchical structure of the academic self-concept might look like. In this example, academic self-concept consists of two contrasting domain-specific facets: mathematics and verbal self-concept. These facets, in turn, are built from subject-specific self-concepts, which are positioned under the mathematics and verbal self-concepts according to how closely they are related to the mathematical or verbal domains (Marsh et al., 2024).

Academic self-concept may thus be seen either as a global construct capturing students' general perceptions of their abilities in school, or as a domain- or subject-specific construct, such as mathematics self-concept, verbal-self-concept, or English self-concept. Several studies have found, however, that subject-specific self-concept is more strongly related to academic achievement than global academic self-concept (Hansford & Hattie, 1982; Valentine et al., 2004). This may in part be explained by how self-concept is formed within individuals. Academic

self-concept evaluations are typically understood to be made against several standards of comparisons (Marsh, 1986; Marsh, Abduljabbar, Morin, et al., 2015; Marsh et al., 2017). This means that broad measures of academic self-concept typically incorporate conflicting perceptions that students may have of their abilities in different domains or subjects, which may reduce the predictive value of global self-concept measures (Valentine et al., 2004). The formation process of academic-self-concept is discussed in the following section.

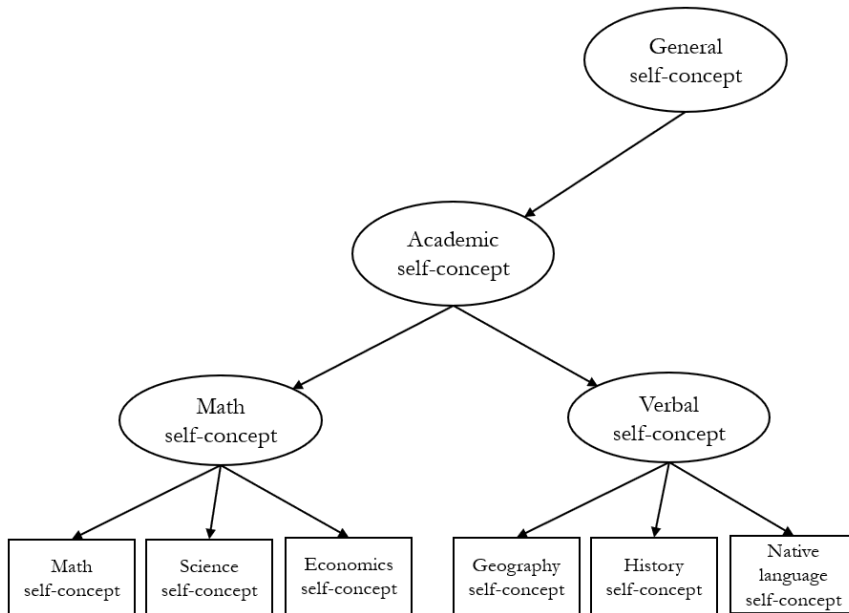


Figure 1. The structure of academic self-concept

As suggested by Marsh et al. (2024)

3.3 The Formation of Academic Self-Concept

The formation of academic self-concept is complex in nature and involves several processes simultaneously. A self-concept in a given academic domain forms in relation to multiple frames of reference—or frames of comparison—that are more or less involved in the formation (Marsh, 1986; Marsh, Abduljabbar, Morin, et al., 2015). The most important frames of reference are social comparisons, cross-dimensional comparisons, and temporal comparisons (Marsh et al., 2017, 2024). Each of these reference frames relate to achievement or ability in different ways.

Numerous studies have demonstrated the interdependence of academic self-concept and achievement. The following sections present the relevant frames of reference for the formation of academic self-concept, beginning with social and external comparisons.

3.3.1 Social or External Comparisons

Social and external comparisons of ability concern comparisons made against reference frames outside of the individual (Marsh & Shavelson, 1985). For example, the statement that a student's mathematical ability is above or below average is made in relation to an external frame of reference. From this perspective, we understand and construct reality in relation to others. For a student, this external frame of reference may be their classmates or schoolmates. The student uses information about the academic achievement or ability of her peers to inform her perception of herself. Therefore, her self-concept in mathematics, for example, is not merely a reflection of her previous achievements in the subject. It is also influenced by comparison with her peers. Marsh and Shavelson (1985) observed that if a student performs below average in both mathematics and English, their self-concept in both subjects will also be below average due to external comparison. However, if the student performs better in mathematics than in English, he or she may instead have an average level of self-concept in mathematics despite performing below average in both subjects. This leads us to dimensional comparisons between subjects.

3.3.2 Dimensional or Internal Comparisons

Dimensional and internal comparisons of ability concern comparisons made against reference frames within an individual, but across different domains or subjects (Marsh & Shavelson, 1985). Here, students compare their abilities in mathematics with their ability in other subjects, such as English, science, and history, and vice versa. Performing better in mathematics than in English, for example, will lead to a higher self-concept in mathematics and a relatively lower one in English (Marsh, 1986). Therefore, students may excel in all subjects at school without necessarily having a high self-concept in each subject. As mentioned above, the different comparison frames interact when students' form their academic self-concepts. This means that students make internal and external comparisons simultaneously, and both reference frames should therefore be

considered when investigating academic self-concept formation in an effective way (Skaalvik & Rankin, 1990).

3.3.3 Temporal Comparisons

Temporal comparisons of ability are made within an individual and subject over time. From this perspective, students use their previous performance or abilities in a given subject as a frame of reference against which to compare their current abilities in the subject (Marsh et al., 2024). Temporal aspects in self-concept formation can be understood in two different ways. From one perspective, previous achievements in a subject provide students with information that informs how they subsequently perceive themselves in that subject. In this case, high previous performance in mathematics would therefore be linked to a high subsequent self-concept in mathematics. This positive relationship is very much in line with the definitions of academic self-concept and has been studied extensively through the reciprocal effects model in previous research (see, for example, Marsh & Martin, 2011).

From another perspective, temporal comparisons can be understood as a frame of reference providing students with information on their development over time (Albert, 1977). For example, when a student has struggled in mathematics, but after some time of practice suddenly understands, this will likely boost her self-concept in mathematics. Another example is when teachers help students to recognise their development in a subject. Students can then compare their current ability with their previous ability, which likely will boost their self-concept in that subject. These two temporal perspectives in academic self-concept formation do not contradict each other, rather, they address different temporal aspects. The first perspective is about absolute levels of academic self-concept and its reciprocal relationship with achievement. The second perspective concerns relative change over time, addressing the question of whether academic self-concept increases when academic achievement increases, regardless of the initial and absolute levels of self-concept or achievement (Wolff et al., 2025). For example, the statement: *I am doing better than before* can apply to all students and is not dependent on specific performance levels. While the first type of temporal relationship has been extensively studied in research on the formation of academic self-concepts, the developmental aspect of these comparisons has received less attention.

3.4 The Internal/External Frame-of-Reference Model

The I/E model was first developed by Marsh (1986) to further investigate and explain the findings of a previous study conducted by Marsh and Shavelson (1985). In the 1985 study, strong relationships had been observed between achievement across academic subjects, but no substantial relationships were found between self-concepts in different academic subjects. In contrast to achievement, these results suggested that subject-specific self-concepts were relatively independent of each other. Achievement, however, was substantially related across subjects. This meant that students who performed well in mathematics were likely to also perform well in English. However, students who perceived their mathematical abilities positively were unlikely to have a similar positive perception of their English abilities, even if their English ability was as high as their mathematical ability. This contrasts with the hierarchical model proposed by Shavelson et al. (1976), which posited that both academic self-concept and achievement were substantially related across subjects.

With the I/E model, Marsh and his colleagues proposed that the inconsistent relationships between subject-specific self-concepts versus subject-specific achievements were due to dimensional comparisons. Dimensional—or internal—comparisons of ability across subjects provides students with information beyond their actual ability in a subject, namely, their ability in another subject. Students may therefore form subject-specific self-concepts that do not entirely match their subject-specific achievements. This means that a student's self-concept in one subject (for example, in mathematics) is formed not only through achievement in the matching subject, but also through achievement in a non-matching subject (for example, in English). According to the I/E model, this is explained by internal and external comparisons. Students' mathematical self-concepts are formed by assessments of their performance in mathematics, through information such as teacher feedback, tests, grades, and peer achievement. A high level of performance in mathematics equals high mathematics self-concept. This is referred to as external comparisons. Internal comparisons, however, refer to the cross-dimensional comparisons that shape the relationship between mathematical achievement and English self-concept (and vice versa). Here, students' English self-concepts are formed by comparing their achievement in mathematics and English. If students perceive that they perform better in mathematics than in English, their mathematics self-concept will be higher than their English self-

concept. Conversely, high perceived English performance is associated with a low mathematics self-concept. The I/E model is illustrated in Figure 2.

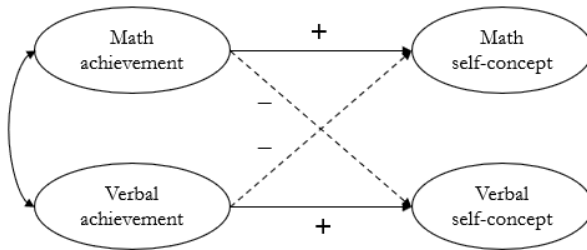


Figure 2. Theoretical depiction of the I/E frame-of-reference model

A solid line indicates an expected positive association, while a dashed line indicates an expected negative association.

3.5 The Big-Fish–Little-Pond Effect

The big-fish–little-pond effect (BFLPE) was first introduced by Marsh and Parker (1984) to investigate how social comparison influences the formation of an academic self-concept. The BFLPE builds on the social comparison theory, developed by the social psychologist Leon Festinger. Festinger (1954) observed that individuals evaluated themselves and their abilities by comparing themselves to others. Social comparison is thus an external frame of reference. In a school setting, social comparisons occur when students evaluate their own achievements and abilities against those of their peers (Marsh & Basarkod, 2023). According to the BFLPE, these comparisons influence how students perceive their own ability. The name of this empirical theory, big-fish–little-pond, refers to the psychological advantage of being a higher-achieving student (big fish) in a lower-achieving class or school (little pond). Conversely, lower-achieving students (little fish) in higher-achieving classes or schools (big ponds) experience a disadvantage, which is reflected in their self-concept (Marsh et al., 2024).

Social comparisons can be roughly distinguished between comparisons directed either upward or downward. Wills (1981) defined a downward comparison as when individuals compare themselves with others who are less fortunate than them, and thereby increasing their subjective well-being. An upward social comparison is instead when individuals compare themselves with others who are better than them, which can both deflate or inflate their self-evaluation (Collins, 1996). In a school context, students are restricted to their peers as frames

of reference. The BFLPE predicts that students attending schools with higher average achievement levels will report lower academic self-concepts than equally able students attending schools with lower average achievement levels (Marsh & Basarkod, 2023). This means that when students compare themselves with higher-performing peers, their academic self-concepts become deflated. Consequently, students in high-achieving environments tend to have lower self-concepts than those in lower-achieving environments.

Besides academic self-concept, the BFLPE model comprises two important components: individual achievement and class- or school-average achievement. As mentioned, the relationship between individual academic achievement and self-concept is positive in nature, meaning that performing well in mathematics is linked with a high self-concept in mathematics (see, for example, Chiu, 2012). Class- or school-average achievement provides information on the frame of reference to which students are exposed. A high school-average achievement means that many students in that school are likely to make upward social comparisons, that is, comparing themselves against higher-achieving peers. The relationship between average achievement and individual self-concept therefore tends to be negative: higher average achievement is linked with lower individual self-concept (Marsh & Parker, 1984). The association between social comparison and academic self-concept formation is examined by considering these two levels of achievement simultaneously: the association between individual achievement and self-concept, and the association between class- or school-average achievement and self-concept (see Figure 3). This means that the better students perform academically, the higher their academic self-concept. At the same time, however, the higher the average class or school achievement, the lower the individual students' self-concept.

3.5.1 Contrast versus Assimilation Effect

In line with the social comparison theory underlying the BFLPE, students' self-evaluations are made in contrast to the environment and are therefore referred to as contextual contrast effects. A contextual assimilation effect, on the other hand, occurs when students experience a positive effect of being affiliated with a high-performing group. One example of this is the basking-in-reflected-glory effect (BIRGE). The BIRGE predicts that when students perceive their class or school (i.e., their reference group) to have high status, it affects their self-concepts positively (Marsh et al., 2000). The glory of attending a high-status group thus

reflects on the individuals in the group, regardless of individual achievement levels. In contrast to the BFLPE, which assumes that attending a high-achieving group affects students' academic self-concepts negatively, the BIRGE thus assumes the opposite. Although both effects concern the formation of academic self-concept, research has indicated that the BFLPE is the most dominant effect of the two (Marsh et al., 2000). The negative effect of social comparison tends to have a greater impact on students' self-concept than the positive effect of attending a high-status group (Dicke et al., 2018).

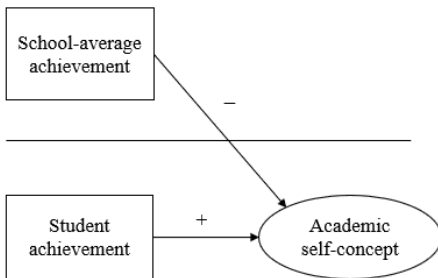


Figure 3. Theoretical depiction of the BFLPE

3.5.2 The Bright-Student Hypothesis

The principal hypothesis of social comparison and the BFLPE is that all students are equally affected by the negative impact of social comparison, regardless of individual achievement or ability (Marsh, 2007). However, a contrasting hypothesis suggests that students on the higher end of the achievement scale are less sensitive to social comparisons than their lower-achieving peers. This is referred to as the bright-student hypothesis (Marsh & Basarkod, 2023) and it posits that higher ability serves as a protection against negative social comparison. However, the bright-student hypothesis has not been thoroughly examined, and previous research has provided inconsistent results. The specific purpose of Study II was to further investigate the bright-student hypothesis, using individual cognitive ability as a measure of brightness rather than grades or standardised test results, as in previous research.

3.6 The Reciprocal Effects Model

The reciprocal effects model (REM) concerns the mutual relationship between academic achievement and self-concept over time. This empirical theory explains

how academic self-concept is formed through its dynamic relationship with academic achievement (Marsh et al., 2024). Academic achievement influences later self-concept, which then influences later achievement. In other words, academic achievement and self-concept develop together by reinforcing each other over time. The REM was first developed by Marsh (1990a) to combine the two models of self-enhancement and skill development. The self-enhancement model is based on the assumption that perception of ability causes greater achievement, through the greater effort, motivation, and resilience that comes with having a high self-perception (Marsh, 1990a). This model is investigated with the relationship between prior academic self-concept and subsequent academic achievement. In contrast, the skill development model is based on the assumption that academic achievement causes greater academic confidence. For example, when students perform high on a test in mathematics, this success leads to an improved self-concept in mathematics. The skill development model is investigated with the relationship between prior academic achievement and subsequent academic self-concept. However, when the two models were integrated, Marsh (1990a) demonstrated that they were both too simplistic in their separate forms and did not reflect the dynamic relationship between academic achievement and self-concept. Their mutual relationship has been observed in many subsequent REM studies (see, for example, Hübner et al., 2023; Marsh & O'Mara, 2008; Möller et al., 2011).

3.7 Integrated Models of Academic Self-Concept Formation

As the theory of academic self-concept formation posits that an academic self-concept is the product of all frames of reference simultaneously, efforts have been made to integrate these reference frames into combined models. For example, the reciprocal internal/external (RI/E) model integrates the REM with the I/E model, to investigate longitudinal and reciprocal relationships between achievement and self-concept within and across subjects (Möller et al., 2011, 2014). It extends the REM model with information on internal comparisons, while it also extends the I/E model with information on the longitudinal and reciprocal interplay between achievement and self-concept within and across subjects. The I/E model has also been integrated with the BFLPE (Parker et al., 2013) and with the BIRGE (Wolff, Lüdtke, et al., 2021), to investigate the joint effects of internal and social comparisons. That is, accounting for both the negative and positive effects of

social comparison as well as the dimensional comparisons between two subjects. Another example is the 2I/E model, which extends the classic I/E model of internal and external comparisons by also accounting for temporal comparisons. These empirical models offer a comprehensive framework for understanding the complexities of the formation of an academic self-concept.

3.8 Academic Self-Concept as Outcome, Predictor, and Development Process

Academic self-concept is both an outcome and a predictor. As an outcome, it provides information on how students assess and process the achievement information around them. Teacher-reported grades, test results, and peer achievement provides students with information, which they use to shape their academic self-image (Bong & Skaalvik, 2003). As discussed in the current chapter, a student's self-concept in a given subject or domain is the result of various comparison processes. A self-concept in the subject of Swedish depends on individual achievement in the subject (skill development), as well as in other subjects (internal comparisons). It is also influenced by contextual factors, such as the average Swedish achievement level at the class or school (social comparisons). A student's self-concept in Swedish is shaped by all of these reference points together.

However, students are provided with constant, changing feedback at school, so the formation of an academic self-concept cannot be considered a static event. It develops and may change over time, often in relation to achievement (Marsh et al., 2005). When students improve over time, as is the natural process of learning, they are provided with new information about their achievements, which they can use to reevaluate their perceived abilities. However, although academic achievement and self-concept are positively and reciprocally related, research investigating growth in individuals over time has shown that declines in self-concept levels during adolescence are quite common (see, for example, Jacobs et al., 2002; King & McInerney, 2014). This may, for example, reflect increased peer achievement levels, the cementation of early academic identities (for example, 'I am good at English and bad at mathematics'), and increased differentiation in self-concepts between subjects as students age. Academic self-concept formation and development are explored in Studies I and II. Specifically, the developmental stability of internal and external comparisons are investigated in Study I, whereas

moderation effects of social comparisons in the BFLPE are investigated in Study II.

Academic self-concept is not only an outcome, but also a predictor of other academic factors. It has been found to be positively associated with subsequent factors such as academic achievement ([self-enhancement] Marsh & O'Mara, 2008), course selection (Nagy et al., 2006) and occupational aspirations (J. Guo et al., 2015). In several studies, it has been found that academic self-concept explains variation in subsequent choices, independently of achievement. For example, students who perceive their abilities in mathematics positively are more likely to select further courses in mathematics. This emphasises the importance of academic self-perceptions, as they contribute independently to the paths students take. Students who perceive themselves as academically capable also tend to be more interested in the subject (Marsh et al., 2005), more engaged, and more willing to put in effort (Eccles & Wigfield, 2002). In Study III, academic self-concept will be explored as a predictor by studying its association with income in adulthood.

3.9 Summary: Theoretical Assumptions

Guiding the Thesis

An academic self-concept is defined as a student's perception of her academic abilities and is formed through past and present experiences in school. It is a multidimensional construct, meaning that it can be operationalised as a global or domain-specific construct, such as in the mathematics or verbal domains. An academic self-concept in a given domain is influenced by past and present individual achievement in that subject, by individual achievement in other subjects, and by the achievement level of peers. These influencers are referred to as frames of reference and are the standards against which students compare themselves. Such reference frames include external, internal, and temporal comparisons. These are theoretically explored through various empirical models. Relevant for the present thesis are the internal/external (I/E) frame-of-reference model, the big-fish–little-pond effect (BFLPE), and the reciprocal effects model (REM). Students' academic self-concepts have implications for subsequent educational outcomes, such as achievement and course selection.

Chapter 4 Previous Research

The studies included in this chapter were selected based on their theoretical, empirical, and methodological relevance to the research questions of the thesis. In terms of theoretical relevance, the chapter focuses on studies of the internal/external (I/E) frame of reference model, longitudinal development of academic self-concept during adolescence, the big-fish–little-pond effect (BFLPE), and long-term associations. In terms of empirical and methodological relevance, particular attention was given to studies using longitudinal data, multilevel designs, and large samples of adolescent students. Many of the studies referred to here were based on data from Germany and English-speaking countries, such as the United States, the United Kingdom, and Australia. These countries have a long-standing tradition of academic self-concept research. Although academic self-concept has been studied across a variety of countries and contexts, there is a need for further studies from different educational systems.

4.1 Academic Self-Concept Formation

In the field of educational psychology, many studies have been conducted with the aim of broadening the knowledge of how an academic self-concept forms. Theories of academic self-concept formation posit that it forms in relation to academic achievement in different ways. This notion has been thoroughly supported by numerous empirical studies in the field. For example, extensive research on the I/E and BFLPE models have demonstrated a positive association between students' academic achievement and current or subsequent self-concept in the same subject (Fang et al., 2018; Marsh, 1986; Marsh et al., 2014; Schmidt et al., 2018; Z. Wang, 2015). However, other aspects of academic achievement are relevant to consider in the formation of an academic self-concept, such as the dimensional and social aspects.

In the following section, the relationship between achievement and self-concept is discussed in relation to social comparison and the BFLPE model.

4.1.1 Social Comparison and the BFLPE

The BFLPE is typically investigated using the methodological approach of multilevel modelling (Marsh et al., 2009). This approach involves academic achievement and self-concept at both the individual and group levels. The relationships between academic achievement and self-concept are estimated at both levels. The BFLPE is then calculated as the extent to which the group-level relationship differs from the individual-level relationship (Lüdtke et al., 2008; Raudenbush & Bryk, 2002). In other words, it is the expected difference in self-concept between students with the same level of individual achievement who attend schools with different average levels of achievement (Raudenbush & Bryk, 2002). A statistically significant BFLPE indicates that school-average achievement is related to individual self-concept (Marsh et al., 2009). Theoretically, this difference in self-concept between equally able students experiencing different contexts represents the negative effect of social comparisons.

There is extensive evidence of the negative impact of social comparisons on academic self-concept. For example, Televantou et al. (2021) investigated the BFLPE in the domain of mathematics using a large sample of primary school students in the UK. They found statistically significant negative relationships between school-average mathematics achievement and students' mathematics self-concept for students in Grade 1 (ages 5 to 6) and Grade 4 (ages 8 to 9). This indicated that students in higher-achieving schools had lower self-concepts in mathematics than equally able students in lower-achieving schools. This was suggested to represent the negative contextual impact of social comparison. Dicke et al. (2018) observed similar negative BFLPEs in mathematics for US students from kindergarten through Grade 5. The BFLPE has been found also for students in lower and upper secondary school. For instance, Marsh et al. (2000) investigated the BFLPE using a sample of around 8,000 8th and 9th grade students in Hong Kong. Global academic measures of achievement and self-concept were included in the analysis, as was students perceived school status, which reflected the positive assimilation effect of attending high-status schools. The results revealed that school-average achievement was negatively related to students' academic self-concepts, even when the positive relation between perceived school status and self-concept was accounted for.

Like the study of students in Hong Kong, many BFLPE studies are conducted in countries where there is a high degree of achievement segregation between schools. Countries or regions such as Hong Kong and Germany organise

compulsory education through selective ability grouping, creating schools or tracks with distinct achievement levels. However, the BFLPE has also been observed in countries or systems where ability-grouping is less selective, or even non-existent (Holm et al., 2020; Jónsdóttir & Blöndal, 2024). Several studies have demonstrated a cross-cultural stability of the BFLPE when comparing it across different education systems and countries (for example, Marsh, Abduljabbar, Morin, et al., 2015; Z. Wang, 2015; Z. Wang & Bergin, 2017). After controlling for students' perceived relative standing (i.e., their perceived level of achievement compared to that of their classmates), Wang (2015) and Wang and Bergin (2017) found evidence of the BFLPE in mathematics in 49 countries and regions using TIMSS (Trends in International Mathematics and Science Study) data from 2007 and 2011. Similar results were found by Marsh, Abduljabbar, Morin, et al. (2015), who examined the generalisability of the BFLPE using large-scale TIMSS data. Using multigroup-multilevel latent variable modelling, they compared the BFLPE between two age groups of students from Asian, Middle Eastern, and Western countries. The results revealed a negative association between class-average mathematics achievement and mathematics self-concept in both age groups in all countries included in the study. However, the strength of the BFLPE varied significantly between the two age groups and between countries. The negative BFLPE was stronger among Grade 8 students than among Grade 4 students. It also tended to be more negative in Western and Asian countries than in Middle Eastern countries. Despite these differences, the results indicate that the negative relationship between average academic achievement and self-concept is a universal phenomenon. According to the theoretical basis of the BFLPE, this suggests that students around the world use their peers' achievements as a frame of reference for shaping their self-concepts.

4.1.2 Heterogeneity in the BFLPE and the Bright-Student Hypothesis

In theory, the BFLPE predicts that all students are equally affected by average achievement, meaning that the BFLPE should have a similar impact regardless of, for example, individual achievement level or gender. In a recent study, Dicke et al. (2026) investigated the BFLPE and the peer spillover effect in the mathematics domain, using a German sample of around 2,000 students in Grades 5 and 6. Unlike the BFLPE, the peer spillover effect suggests that high average achievement is linked to high individual achievement. The authors controlled for

school track, prior mathematics achievement, socioeconomic status, and gender. They also included two measures of teaching quality, in order to test the stability of the two effects. Whereas the peer spillover effect largely reflected pre-existing differences, the BFLPE remained robust when the covariates and controls of teaching quality were included. This suggested that all students were as negatively affected by social comparisons, regardless of the teaching quality or which track they were in. In another study, Marsh et al. (2021) investigated the generalisability of the BFLPE by incorporating several potential moderating variables into separate BFLPE models in mathematics. They used a sample of 1,925 Hong Kong students with an average age of 12. The moderating variables included individual achievement, task value, learning strategies, and effort. However, none of these variables had a statistically significant impact on the size of the BFLPE. Overall, these results highlight the robustness of the BFLPE and support the underlying theory of the effect.

However, the results of other studies have suggested that there may be a need to investigate moderating relationships further. For example, studies on the bright-student hypothesis have yielded inconsistent results. Roy et al. (2015) investigated moderators of the BFLPE in the verbal domain, using a sample of 422 Canadian students from 27 classrooms, who attended Grades 3-6. Interactions of individual verbal achievement and differentiated instructional strategies were integrated into the BFLPE model. These strategies were operationalised through a teacher-reported measure consisting of items such as: 'I vary the complexity of assignments to match students' abilities.' The authors found statistically significant interaction effects, showing that the BFLPE was significant only for students with relatively low performance who received less frequent differentiated instruction. Students who received teaching adapted to their level of achievement seem not to have been negatively affected by the average achievement of their class, regardless of their own ability. Another example is the study by Chen (2022), who investigated the bright-student hypothesis with individual achievement acting as a moderator of the BFLPE in mathematics. Using a sample of 2,947 Hong Kong students in Grades 4 and 8, the results revealed statistically significant moderating relationships. The negative BFLPE was somewhat stronger for lower-achieving students than for higher-achieving students. Similar results have been observed in some studies (Marsh et al., 2009; Trautwein et al., 2009), and contradicting results in some (Marsh & Hau, 2003; Seaton et al., 2009). However, the bright-student hypothesis has primarily been investigated using measures of academic achievement, such as standardised test results and teacher-reported grades. Few, if

any, studies have investigated this hypothesis using measures of cognitive ability. The inconsistencies in the moderating role of individual achievement warrant further investigation of the BFLPE using alternative operationalisations of achievement or ability.

4.1.3 Dimensional Comparisons and the I/E Model

Dimensional comparisons refer to the process where students evaluate their ability in one subject by comparing it with their ability in another subject. This academic self-concept formation process is investigated with the I/E model. The classic I/E model is generally conducted with a cross-sectional path model, involving mathematics and verbal achievement and self-concept (Chiu, 2012; Marsh, 1990b). In one of the earlier works on academic self-concept, Marsh (1986) examined these four components of the I/E model and found that, although verbal and mathematical achievement were strongly correlated, verbal and mathematical self-concepts were not. Students perceived themselves as being better at one subject than another, and thus overestimated the actual difference in their ability across the subjects.

In the early I/E study, Marsh (1986) used 11 previous studies of the Self-Description Questionnaire (SDQ) to investigate relations between academic achievement and self-concept. The results revealed strong positive associations between academic achievement and self-concept in the matching domains. High achievement in one subject was thus related with a high self-concept in the same subject. Conversely, negative relationships were identified between academic achievement and self-concept across domains. For example, high achievement in mathematics was associated with a lower self-concept in English. These results have been replicated with other samples in several studies. For instance, Möller et al. (2009) conducted a meta-analysis, investigating the relationships between mathematical and verbal achievement and self-concept. They examined a sample of 69 datasets comprising a total of 125,308 participants. The results revealed positive relationships between achievement and self-concept within both domains. Conversely, negative relationships were found between mathematical achievement and verbal self-concept, and between verbal achievement and mathematical self-concept. It was argued that these negative relationships reflected the process by which students form their self-concept in mathematics, partly through comparisons with their ability in the verbal domain.

The I/E pattern of relationships has also been investigated using academic subjects other than mathematics and the verbal arts. For example, Marsh et al. (2015) investigated the associations between achievement and self-concept within and between the subjects of mathematics and science. They analysed TIMSS data from a large sample of 117,321 Grade 4 and Grade 8 students from 13 countries. On average, the relationships within each subject were statistically significant and positive across the age groups and countries. The relationships across subjects were statistically significant and negative. The negative pattern suggested that students differentiated between their abilities in mathematics and science, and that their self-concepts in these subjects were formed in relation to each other. Mathematics and science are two subjects within the same domain of mathematics-related subjects and are less contrasting than mathematics and a verbal subject. Conversely, mathematics and verbal subjects belong to different domains (Marsh et al., 2024). The results of the study by Marsh et al. (2015) thus suggested that, despite belonging to the same domain, students formed distinct self-concepts in the mathematics and science. However, previous results on this matter have been inconsistent. Möller et al. (2006) investigated the I/E model by incorporating two verbal subjects, German as a first language and English as a second language, and two numerical subjects, mathematics and physics. The authors analysed a sample of 1,440 German students from Grades 7-10 on the Gymnasium track, which is the most selective secondary school. As expected, the results showed that achievement in each subject was positively related to the corresponding self-concept. However, achievement in mathematics and physics were positively related across subjects with self-concept, rather than negatively related. In the verbal domain, achievement and self-concept were more or less unrelated across German and English. These inconsistencies between previous studies could be due to the different operationalisations of self-concept. For example, it is possible that physics is more mathematics-related than science in general, which also incorporates subjects such as biology and chemistry. Students may have more distinct self-concepts in mathematics and science, and more similar self-concepts in mathematics and physics.

4.2 Development of Academic Self-Concept during Adolescence

A variety of longitudinal methods, samples, and designs have been used to investigate the development of students' academic self-concept. These studies

provide insights into average levels of academic self-concept over time and how these trajectories may differ on account of individual or contextual factors. They also reveal differences in self-concept trajectories across different academic subjects. A sample of these studies will be discussed in the following sections, focusing on the development of academic self-concept, its reciprocal relationship with academic achievement, and the increasing differentiation between subjects over time.

4.2.1 Stability and Change over Time

Overall, previous research into the development of academic self-concepts has shown that average levels decrease during adolescence (Jacobs et al., 2002; Nagy et al., 2010). This means that, as students progress through compulsory education and their academic knowledge increases, their academic self-concept tends to decline. At an individual level, it is well established that academic achievement is positively related with academic self-concept throughout adolescence (see, for example, Marsh & Martin, 2011). However, as standards for *high achievement* constantly change and increase as students progress through secondary and upper secondary school, it is not possible to understand the development of their academic self-concept solely in relation to their educational progress. It has been argued that the decline in academic self-concept during adolescence is linked to factors such as an increasingly demanding school environment, pressure, and peer competition. As students get older, they tend to be exposed to more frequent testing and grading. This type of feedback has been shown to provide students with information that may lower their self-perception (Vogl et al., 2018). It also provides information on their ranking relative to their peers, which may encourage peer competition. By the time they finish secondary school, students will have had a variety of positive and negative academic experiences on which to base their assessment of their abilities in different subjects. Marsh, Abduljabbar, Morin, et al. (2015) compared the BFLPE in the mathematics domain using data from students in Grade 4 and Grade 8. While the BFLPE was statistically significant and negative in both grades, it was considerably stronger among eighth-grade students than fourth-grade students. Fang et al. (2018) found similar results in their meta-analysis of the BFLPE, using a sample of 56 effect sizes from 33 studies. Their results showed that the BFLPE was moderated by age and that the contextual effect was strongest when students attended secondary school, in contrast to primary school, middle school, and upper secondary school. Overall, these results suggest that

students rely more and more on social comparison to form their academic self-concepts during compulsory schooling.

Although some studies have suggested that the average levels of academic self-concept decrease during adolescence, students' relative rank order seems to remain stable over time. Scherrer et al. (2023) investigated the development of general academic self-concept in a sample of 2,722 German students between Grades 5 and 8. They found that the relative standing remained stable over time. This meant that students with high levels of general academic self-concept compared to their peers in fifth grade also had high levels in eighth grade, even if average levels changed. However, while this was true for the majority of students, others had more unstable trajectories that increased or decreased over time. There was also variation within students over time. This meant that, although the order of their academic self-concepts remained stable relative to their classmates, their individual levels varied over time. Scherrer et al. (2023) investigated whether these individual differences in academic self-concept development were related to students' perceptions of classroom climate. They found that classroom climate was positively related to academic self-concept development and that perceived competition and disruptions in class were negatively related to it.

Overall, previous research has demonstrated that the academic self-concept changes during adolescence. Although average levels tend to decline as students progress through their education, the rank order remains relatively stable, even though individual growth trajectories vary over time.

4.2.2 Longitudinal Relations between Academic Achievement and Self-Concept

Many studies have demonstrated a positive and reciprocal relationship between academic achievement and self-concept, known as the reciprocal effects model (REM). Wu et al. (2021) investigated the longitudinal and reciprocal relationship between academic achievement and self-concept in a meta-analysis of 68 previous studies. They found statistically significant relationships showing that prior academic achievement positively predicted subsequent self-concept, while prior self-concept positively predicted subsequent achievement.

Wolff, Sticca, et al. (2021) investigated the integration of the REM with the I/E model in three studies using longitudinal data. Study 1 involved 1,508 German students who were assessed six times between Grades 4 and 8. Study 2 involved 748 Swiss students who were assessed six times between Grades 9 and 11. Study

3 involved 3,710 Belgian students who were assessed three times between Grades 4 and 6. In Studies 1 and 2, achievement was operationalised using teacher-reported grades, and in Study 3, it was operationalised using standardised tests. In all three studies, they found statistically significant and positive reciprocal relationships between mathematics self-concept and mathematics achievement, as well as between verbal self-concept and verbal achievement. However, the relationships across domains were negative or close to zero. For example, achievement in one domain was negatively related to self-concept in the other domain. These results are consistent with the hypotheses underlying both the REM and the I/E model. Specifically, achievement and self-concept reinforce each other positively within a subject, but high achievement in one subject is negatively related to the self-concept in another subject. These relationships were observed in all three studies; however, the strength of the relationships in Study 3 was somewhat weaker than in the other studies. This may be due to the differences in the way achievement was operationalised. Hübner et al. (2023) investigated the REM in the mathematics domain, and used both teacher-reported grades and standardised tests as operationalisations of achievement. They examined data from 3,757 German students, who were assessed once a year between Grades 5 and 8. Their results showed that prior grades were positively related to subsequent self-concept, and prior self-concept was positively related to subsequent grades. However, self-concept was only weakly related to subsequent test achievement, and the relationship between prior test achievement and subsequent self-concept was not statistically significant.

These results suggest that students rely more on teacher-reported grades than on test results when forming their academic self-concepts. Vogl et al. (2018) investigated the relationships between mathematics self-concept and different indicators of achievement and ability, using a sample of 730 German sixth-grade students from the top track of the school system. They found that self-concept was most strongly related to grades, followed by achievement test scores and cognitive ability. In another study, Marsh et al. (2014) examined an extended I/E model by comparing the relationships between academic achievement and self-concept in several subjects, using two different measures of achievement: grades and standardised tests. The sample comprised 1,045 German students in Grades 5 and 9 from an area with low average academic achievement. The results were similar to those identified in other studies. That is, they found that academic achievement and self-concept were positively related within subjects and

negatively related between subjects. However, the relationships were stronger when achievement was measured using grades.

Overall, this body of research suggests that academic self-concept is positively and reciprocally related to achievement within the same subject domain. However, the strength of the relations may differ depending on how achievement is operationalised. Teacher-reported grades appear to be more strongly related to academic self-concept than other types of achievement and ability indicators. This is possibly due to the greater visibility of grades compared with other indicators, such as cognitive ability (Vogl et al., 2018).

4.2.3 Subject-Specific Development and Differentiation

Previous research has shown that average levels of academic self-concept tend to decline during adolescence, and that academic self-concept is reciprocally related to academic achievement. However, it has also shown that, over time, students develop more clearly defined, subject-specific self-concepts (Fang et al., 2018; Marsh, Abduljabbar, Morin, et al., 2015). Thus, as students grow older, their academic self-concepts become more distinct across subjects. Before this differentiation develops, students tend to have a more general academic self-concept and less defined subject-specific ones (Guerin & Tatlow-Golden, 2018; Marsh et al., 2002). In other words, younger and less experienced students are more likely to evaluate their general academic abilities to form their academic self-concept. This can be gauged by statements such as ‘I am good at school’.

As students progress through compulsory education, they gain an increasing amount of subject-specific experience and feedback. This provides them with more information about their abilities in the different subjects, which helps them to form narrower self-concepts in, for example, mathematics and Swedish. This has been demonstrated through investigations of the I/E model, in which academic self-concepts appear to be weakly related across subjects, despite substantial correlation in academic achievement (Arens & Niepel, 2023). Dimensional comparisons, i.e., when students compare their abilities in different subjects internally, mean that their subject-specific self-concepts are formed in contrast to each other (Marsh, 1990b). Wan et al. (2023) investigated the role of dimensional comparisons in the development of students’ mathematical and verbal self-concepts between Grades 1 and 12, using a sample of 1,069 US students. The results showed that the use of dimensional comparisons to form self-concepts increased over time. This increase appeared to be related to the increased

differentiation of self-concepts across subjects. In other words, as students grow older, they seem to form their verbal self-concept more and more in contrast to their mathematical self-concept, and vice versa (Wan et al., 2023). This process can also be understood as the development of academic identities, where students gradually begin to define themselves as either stronger or weaker in particular subjects.

However, research combining dimensional comparisons with the longitudinal development of academic self-concept remains limited. As average levels of academic self-concept appear to decline during adolescence, it is important to examine individual differences in these trajectories in more detail. In other words, there is a need for studies investigating whether changes in academic self-concept during adolescence are related to the internal and external comparison processes described by the I/E model. In Study I of the present thesis, the trajectories of students' mathematics and English self-concepts are investigated in relation to internal and external comparisons during adolescence.

4.3 Long-Term Outcomes of Academic Self-Concept

In the final part of this chapter, the focus shifts from the formation of academic self-concept to its relationship with subsequent outcomes. Overall, it has been found that students' academic self-concepts are positively associated with important subsequent outcomes that may shape later educational and occupational pathways. In the following subsections, previous research on the predictive role of academic self-concept in relation to factors such as motivation, course selection, and occupational choices will be presented and discussed.

4.3.1 Achievement, Motivation, and Engagement

As previously discussed in the thesis, there is a well-documented positive relationship between academic self-concept and achievement. That is, when students have a positive perception of their abilities in a subject, this tends to be associated with higher academic performance in that subject. In their review of previous studies investigating the longitudinal relationship between academic self-concept and achievement, Marsh and Martin (2011) found that academic self-concept predicted subsequent achievement beyond what could be predicted based on prior achievement alone. However, academic self-concept has been found to

be associated with other outcomes as well. Green et al. (2012) investigated the longitudinal relationships between variables such as academic self-concept, motivation, positive attitudes towards school, and achievement. School attitude was operationalised using the indicators 'I like school' and 'I am happy to stay and complete school'. A total of 1,866 Australian students in Grades 7 to 12 were assessed twice, one year apart. The findings showed that students' academic self-concept was positively associated with their attitudes towards school. These attitudes, in turn, were positively associated with class participation, homework, and test performance, and negatively associated with absenteeism. Furthermore, academic self-concept was found to predict class participation and homework beyond what could be predicted based on motivation alone. In another study, Guay et al. (2010) investigated the relationships between academic self-concept, autonomous academic motivation, and academic achievement, using longitudinal data from a sample of 925 secondary school students. The findings suggested that motivation mediated the relationship between academic self-concept and achievement. In other words, students who believe they are good at a subject appear to be more likely to develop an autonomous desire to learn, which is positively related to academic achievement. In addition to its association with academic motivation and engagement, academic self-concept has been found to be positively related to students' academic interest. Marsh et al. (2005) investigated the relationship between self-concept and interest in mathematics, using two samples of German seventh-grade students measures at two time-points ($N = 5,649$ and $2,264$). The results showed that prior academic self-concept was positively related to subsequent interest in mathematics, as well as to grades and test results in mathematics. However, the relationship between prior interest and subsequent self-concept was weak or non-significant, and it was not related to grades or test results.

Overall, the literature on the relationship between academic self-concept and academic achievement and non-cognitive outcomes suggests that self-concept is an important factor in students' success at school. Students who perceive their abilities positively seem to be more motivated, interested, and positive about school. These outcomes are important in their own right, but they may also influence students later choices and pathways.

4.3.2 Educational Choices and Attainment

Studies have shown that students' academic self-concept relates to their educational pathways, for example in terms of course selection and attainment (Guay et al., 2004; Marsh & Yeung, 1997b). In an early study of academic self-concept, Marsh and Yeung (1997b) investigated the relationships between subject-specific self-concept, achievement, and course selection in multiple school subjects. A sample of 246 tenth-grade students from a boys' school in Sydney, Australia, was used. For each subject, the relationship between self-concept and the desire to select a course for the following school year, as well as the courses ultimately chosen, was statistically significant and positive. By contrast, grades in each subject were not related to these choices. Similar findings have been observed in more recent studies, based on larger samples. For example, Nagy et al. (2006), investigated the relationship between academic self-concept and subsequent course selection in mathematics and biology, using a sample of 1,148 German students when they attended Grade 10 and Grade 12. The results showed that self-concept in mathematics was positively related to the selection of advanced mathematics courses two years later. In biology, intrinsic value acted as a mediator between self-concept and advanced course selection. Additionally, in line with the assumptions underlying the I/E model, there was a negative relationship between mathematics self-concept and course selection in biology. Students' achievement in mathematics and biology in Grade 10, however, was not directly related to their course selection in Grade 12.

As a next step, researchers have also studied the long-term relationship between academic self-concept and educational attainment. Guay et al. (2004) examined this relationship by analysing longitudinal data spanning over a period of ten years from a sample of 465 Canadian students in Grades 3, 4, and 5. Self-concept was operationalised as students' general academic self-perceptions. Educational attainment was defined as the completed educational degree ten years later, which could range between high school first degree and a second university degree. However, the highest possible alternative of completed education level varied for students who were first assessed in Grade 3, 4 or 5. This difference was accounted for. The findings showed that academic self-concepts assessed in Grades 4 and 5 were positively related to educational attainment ten years later. That is, the higher the academic self-concept in compulsory school, the higher the long-term educational attainment. Similar results were observed by Guo et al. (2015), who investigated the relationship between general academic self-concept

and task values in Grade 10 with educational attainment five years after leaving high school. They used a sample of 2,213 U.S. boys. The association between academic self-concept and educational attainment was statistically significant and positive.

Overall, it seems that students' academic self-concepts shape the paths they take, independent of their academic achievement. Both subject-specific and general academic self-concepts appear to be associated with positive student outcomes. Research into the relationship between subject-specific self-concept and academic outcomes has provided insight into why students take certain paths, such as in mathematics or language. Meanwhile, research into general academic self-concept has shed light on the variance in the absolute levels of educational attainment, independent of the subject or domain.

4.3.3 Occupational and Economic Outcomes

Results from previous research suggest that long-term pathways related to students' early academic self-concepts may persist beyond the completion of their education. Lazarides et al. (2020) investigated the association between mathematics self-concept, completed college major, and occupation 22 years after finishing high school. A sample of 867 students from Michigan, United States, was analysed with latent profile analysis. Mathematics self-concept was assessed four times, twice in Grade 7, and once in Grades 10 and 12. Students with high motivational beliefs in mathematics in high school, which included having a high self-concept, were more likely to have pursued a career in a mathematics-related area by the age of 40 than those with lower motivational beliefs. In another study, Hansen et al. (2023) examined, among other things, the long-term relationship between students' general academic self-concept in Grade 10 and their employment and income status at the age of 25. A representative sample of 9,575 British students was analysed. When the background variables, such as gender and socioeconomic background, were included, no statistically significant direct relationships were identified between academic self-concept and the labour-market outcomes. However, the results showed that students with a high academic self-concept in Grade 10 were more likely to study the advanced levels in college and participate in higher education than those with a lower academic self-concept. As these outcomes were positively related to labour-market outcomes, academic self-concept was indirectly related to employment and income status at 25.

Overall, there are indications in previous research that students' academic self-concept may be associated with their long-term pathways, even after they leave the education system. However, there is a need for further studies investigating the association between academic self-concept and labour-market outcomes later in adulthood. At the age of 25, many individuals have not started their intended careers, and their income may not fully reflect their adult income. In Study III of the present thesis, the relationship between general academic self-concept and income at the ages of 35, 40, and 45 was examined.

4.4 Summary of Empirical Gaps and Links to the Three Studies

In summary, previous research has demonstrated that academic self-concept is both an outcome and a predictor of subsequent academic and educational outcomes. Studies have shown that it is formed through multiple comparison processes, that it develops over time in relation to academic achievement, and that it is related to factors such as motivation, interest, engagement, course selection, and educational attainment.

Many studies have found support for the I/E model, and research indicates that students' academic self-concepts become increasingly differentiated across subjects over time. However, few studies have investigated how the internal and external comparison processes involved in the I/E model are related to the growth trajectories of academic self-concept during adolescence. In Study I, these relationships were investigated using longitudinal data and methods, in the domains of mathematics and English as a second language.

Similar to the I/E model, the BFLPE is a well-supported model of academic self-concept formation, addressing how social comparisons are involved in forming students' academic self-concepts. Some studies have suggested that the BFLPE may differ depending on students' individual achievement or ability. The bright-student hypothesis assumes that students with high academic abilities are less affected by school-average achievement than other students, but evidence for this has been inconsistent. However, the bright-student hypothesis has not been investigated using individual cognitive ability as a measure of brightness. This issue was addressed in Study II, which included a measure of students' cognitive ability as a moderator of the BFLPE in mathematics and Swedish.

A large body of previous research has demonstrated that academic self-concept predicts subsequent educational outcomes. However, studies investigating

the relationship between academic self-concept and subsequent labour-market factors, such as income, are limited in number. Additionally, there is a lack of studies that have followed individuals for long enough to examine income after educational and early labour-market pathways have become more established. This gap in the research field was addressed in Study III, in which income was examined at ages 35, 40, and 45.

Taken together, the three studies of the thesis contribute to previous research by addressing how growth trajectories of self-concept may be related to internal and external comparisons, how the formation of self-concepts through social comparison may be moderated by individual cognitive ability, and how self-concept relates to factors beyond the education system.

Chapter 5 Methodology

5.1 Empirical Design of the Thesis

The thesis comprises three empirical studies for which longitudinal questionnaire data have been used in combination with test and register data. Each study addresses a specific aspect of the thesis’s overall aim. Study I focuses on the formation and development of academic self-concepts, Study II examines the formation of academic self-concepts through social comparison, and Study III investigates long-term associations between academic self-concept and adult income. An overview of the three studies is presented in Table 2.

The three studies were based on different cohorts, designs, and methodological approaches in order to investigate academic self-concept from complementary perspectives.

Table 2. Study Overview

	Study I	Study II	Study III
Research focus	Formation and development of mathematics and English self-concepts	BFLPE and the bright-student hypothesis	Academic self-concept and adult income
Cohort(s)	2004	1992, 1998, 2004	1972
Main variables	Mathematics and English self-concept and grades	Mathematics and Swedish self-concept and grades, cognitive ability	General academic self-concept, track-affiliation, GPA, income
Main method	CFA, MI, LGCA	CFA, MI, MSEM	CFA, SEM

Note. Confirmatory factor analysis = CFA, measurement invariance = MI, latent growth curve analysis = LGCA, multilevel structural equation modelling = MSEM, structural equation modelling = SEM.

5.2 Data Sources and Study Samples

All analyses were based on data from the Swedish longitudinal infrastructure Evaluation Through Follow-up (UGU: Härnqvist, 2000). Additionally, register

data from the Gothenburg Educational Longitudinal Database (GOLD) were analysed alongside UGU data.

5.2.1 Evaluation Through Follow-up

UGU is a longitudinal Swedish infrastructure within the educational field, with 11 nationally representative samples of birth cohorts born between 1948 and 2010, each cohort sampled about six years apart by Statistics Sweden. The samples represent about 10% of their respective birth cohorts, with each cohort sample consisting of around 10,000 students. The analysis of the present thesis has been based on the four cohort samples of students born in 1972, 1992, 1998, and 2004.

The sampling procedure, data collection, and questionnaire structure differ somewhat between the four cohorts. Each cohort was sampled using a two-stage stratified procedure. However, the 1972 cohort sample was drawn first from municipalities and then from school classes. In contrast, the samples from the 1992, 1998, and 2004 cohorts were first drawn from municipalities and then from school catchment areas. For each cohort, the sampling procedure was conducted when the students were in third grade. The design of the questionnaire was updated between the data collections of cohorts 1972 and 1992. The nature of the questions is the same in both versions, but they differ somewhat in design and level of specificity (see Tables 4 and 5). Both questionnaires contain items relating to perceived academic abilities, motivation, well-being, and educational plans.

In sixth grade, a test assessing students' cognitive ability was distributed together with the questionnaire. Apart from linguistic updates, the test was identical across the cohorts. It consisted of three sub-tests assessing students' verbal, spatial, and inductive abilities. In addition to the questionnaire and cognitive test data, register data for the UGU individuals are available, compiled by Statistics Sweden. It consists of data on student characteristics, such as year of birth, gender, and parental education level, but also school administrative data, such as teacher-reported grades and national test results. Statistics Sweden has registered school administrative data in all cohorts each year until upper secondary school.

The present thesis uses questionnaire, cognitive test, and register data from four UGU cohorts: 1972, 1992, 1998, and 2004. The study-specific use of these cohorts is described in Section 5.2.3.

5.2.2 Gothenburg Educational Longitudinal Database

The GOLD database provides population register data which can be combined with UGU's test and questionnaire data for the same individuals. This allows analyses to be conducted using comprehensive data that incorporates both student-reported perspectives and registered information on their characteristics and life achievements. The GOLD database compiles register information longitudinally; as such, register information is available for every UGU student within cohorts at the time of each UGU data collection. Thus, GOLD allows UGU individuals to be tracked throughout their lives using registered information. For example, there are variables containing information on higher education level, programs of study, profession, and income.

In Study III, UGU questionnaire data was linked to the participants' registered income in adulthood.

5.2.3 Study-Specific Samples and Inclusion Criteria

Study I was based on data from the 2004 cohort, using questionnaire responses from Grades 6, 9, and 12. This particular cohort was selected because, unlike previous cohorts, the students in this cohort received grades from Grade 6 rather than Grade 8. This made it possible to model change in self-concept between Grades 6 and 9 in relation to Grade 6 achievement. The initial sample size of Cohort 2004 was 9,775. However, some of the students in the sample fell outside the specified age criteria. These students were removed from the sample, resulting in a final eligible sample of 9,437 students. Additionally, the study contained missing data due to attrition. The number of students contributing observed questionnaire data varied across the measurement occasions. Of the students in the final eligible sample, 5,037 responded in Grade 6, 2,453 responded in Grade 9, and 1,858 responded in Grade 12.

Study II was based on data from the 1992, 1998, and 2004 cohorts. These cohorts were selected because they were the three most recent cohorts in the UGU database and students had responded to the same self-concept questions in Grade 9 across the cohorts. Combining the cohort increased the sample size of the study. The initial sample sizes for the cohorts in 1992, 1998, and 2004 were 10,153, 9,671, and 9,775 respectively. The final analytical sample excluded students who were born outside of the target cohort years. In addition, students who attended schools with too few UGU students in Grade 9 to calculate reliable school-level achievement means were excluded. Specifically, students who attended schools

with fewer than five UGU students in total were excluded from the final sample. This resulted in a final analytical sample of 24,771 students across three samples of 8,619, 8,100, and 8,052 students.

Study III was based on data from the 1972 cohort. This cohort was selected because it made it possible to follow students in the sample from compulsory school into adulthood. The initial sample consisted of 9,504 students. Students outside the specified age criteria were excluded from the sample, resulting in a final sample size of 9,037 students. Information on registered income at age 35 was missing from approximately 600 participants.

Table 3. Cohort Overview

	Study I	Study II	Study III
Cohort(s)	2004	1992, 1998, 2004	1972
Data waves	Grades 6, 9, 12	Grade 9; cognitive ability Grade 6	Grade 6, Grade 9, adult income
Initial sample	9,775	29,599	9,504
Analytical sample	9,437	24,771	9,037

5.3 Measures

Several variables and measures have been used in this thesis. In each of the three studies, academic self-concept was investigated in some form. However, due to design changes in the UGU questionnaire, the operationalisation of academic self-concept differs across studies. Additionally, the studies incorporate variables providing information on student achievement, cognitive ability, adult income, and a number of background variables. See Table 6 for an overview.

5.3.1 Academic Self-Concept

The main construct of interest in this thesis is academic self-concept. The three studies investigate slightly different operationalisations of the construct. Study I and II use subject-specific measures, whereas Study III uses a general academic measure. As secondary questionnaire data were used to operationalise academic self-concept, the construction of the measures was driven by a combination of theory and practical considerations, such as the availability of questionnaire items. For example, in Study I, the mathematics and English self-concept measures each had to be identical for Grades 6, 9, and 12 within the 2004 cohort. In Study II, the mathematics and Swedish self-concept measures each had to be identical for

Grade 9 across Cohorts 1992, 1998, and 2004. Due to slight rephrasing and updates in the questionnaire items across both grades and cohorts, as well as the individual requirements of the two studies, mathematics self-concept was measured using different indicators across Studies I and II. Regarding the self-concept measure of Study III, which was based on the older version of the UGU questionnaire, the indicators permitted an analysis of general academic self-concept. See Tables 4 and 5 for an overview of the indicators used to construct academic self-concept.

5.3.1.1 Mathematics Self-Concept

Mathematics self-concept was investigated in Studies I and II. In both studies, it was operationalised using three indicators. Two of the three indicators were used in both studies, while the third indicator was specific to each study. Each indicator reflected the cognitive aspect of students' perceived ability in mathematics. Thus, no affective components were included (e.g., 'I enjoy mathematics'). The shared questions were phrased as follows: 'How well are you able to do mental arithmetic/rough calculation?' and 'How well are you able to solve mathematical problems?'. In addition, Study I included the indicator phrased 'How well are you able to explain mathematics problems?', while Study II included the indicator phrased 'How good do you think you are in mathematics?'.

5.3.1.2 English/ Second-Language Self-Concept

In Study I, second-language self-concept was operationalised using three indicators. Each indicator reflected students' perceived ability in the English subject. Examples of these indicators include 'How well are you able to read and understand a text in English?'. As with the self-concept measure in mathematics, the items in the second-language measure represented cognitive rather than affective aspects of academic self-concept.

5.3.1.3 Swedish/ Verbal Self-Concept

In Study II, verbal self-concept was operationalised using three indicators. Each indicator reflected the cognitive aspects of students' perceived ability in the Swedish subject. Examples of these indicators include 'How good do you think you are in Swedish?' and 'How well are you able to read and understand a text in Swedish?'.

5.3.1.4 General Academic Self-Concept

In Study III, general academic self-concept was operationalised with four pairs of academic self-concept indicators from the older version of the UGU questionnaire. Together, the indicators reflect students' perceived ability in school in a broader sense. The items come in sets of two and concern students' perceived general abilities in school, as well as specifically in mathematics and reading. In each pair, the first question asks the students of their self-perceived ability, such as 'Do you think that you are good at mathematics?'. The second question asks them to make a reflected appraisal based on a teacher or the parents, such as 'Do you think that your teacher thinks that you are good at mathematics?'. The scores for each pair were summed to create four indicators of general academic self-concept. These indicators reflected students' overall satisfaction with school, their self-concept in mathematics and reading, and their belief that they understand what they read.

Table 4. Subject-Specific Academic Self-Concept Indicators

Study	Item	Question
Study I	MSC	How well are you able to explain mathematics problems?
Study I, II	MSC	How well are you able to do mental arithmetic/rough calculation?
Study I, II	MSC	How well are you able to solve mathematical problems?
Study II	MSC	How good do you think you are in mathematics?
Study I	ESC	How well are you able to read and understand a text?
Study I	ESC	How well are you able to write a story?
Study I	ESC	How well are you able to give an oral presentation?
Study II	SSC	How good do you think you are in Swedish?
Study II	SSC	How well are you able to spell correctly in Swedish?
Study II	SSC	How well are you able to read and understand a text in Swedish?

Note. These indicators were available for the 1992, 1998, and 2004 cohorts. MSC = mathematics self-concept, ESC = English self-concept, SSC = Swedish self-concept. Students responded to the 10 questionnaire items on a 5-point Likert scale, ranging from 1 = very bad to 5 = very good.

Table 5. General Academic Self-Concept Indicators

Study	Item	Question
Study III	SCH	Do you think you do well in school?
Study III	SCH	Do you think your parents think that you do well in school?
Study III	MATH	Do you think you are good at mathematics?
Study III	MATH	Do you think your teacher thinks that you are good at mathematics?
Study III	READ	Do you think you are (not) poor at reading?
Study III	READ	Do you think that your parents think you are (not) poor at reading?
Study III	UREAD	Do you think you understand what you read in school?
Study III	UREAD	Do you think your teacher thinks you understand when they talk to the class?

Note. These indicators were available for the 1972 cohort. Responses were made on a yes (1) and no scale (0).

5.3.2 Achievement

In Study I, achievement was operationalised with teacher-reported grades in mathematics and English from Grades 6 and 9. In Study II, achievement was operationalised with teacher-reported grades in mathematics and Swedish from Grade 9. Regarding Study II, where three cohorts were included, it is necessary to note that the grading scale differed between the first cohort (1992) and the two subsequent cohorts (1998 and 2004). Although all three cohorts were graded using a goal-oriented system with nationally established criteria, students in Cohort 1992 were graded on a 4-point scale (including an informal fail grade for students who did not reach the goals set for a subject), whereas students in Cohorts 1998 and 2004 were graded on a 6-point scale. Each grade was represented by a score: in Cohort 1992, these were 0, 10, 15 and 20 (fail–pass with special distinction). In the later cohorts, the grades represented the same range of scores as in the earlier cohort, but with two additional scale steps: 0, 10, 12.5, 15, 17.5 and 20. In both Study I and II, these scores were recoded to range between 0–3 (0, 1, 1.5, 2, 2.5, 3).

In Study III, achievement was operationalised using the grade point average (GPA) based on teacher-reported grades in all subjects in Grade 9. At this time, students were graded on a 5-point grading scale. It is relevant here to note that in the subjects of mathematics, English, and foreign languages, students were differentiated into two tracks—the general and the advanced tracks. Students on both tracks were graded on the 5-point grading scale. However, as the advanced

track criteria were more challenging, students on this track were awarded an additional scale point. Consequently, this variable ranged between 1 and 5.12.

5.3.3 Cognitive Ability

In each cohort, the cognitive abilities of students were tested in Grade 6. The test assessment comprised three tests designed to measure students' verbal, spatial, and inductive abilities. The verbal test comprised 40 items designed to assess students' ability to identify the correct antonym for a given word. For example, students were given the word ANONYMOUS and asked to select its antonym from a list of words, including approved, familiar, famous, colorful. The spatial test consisted of 40 paper-folding tasks, which were designed to evaluate students' ability to match an unfolded paper figure with the corresponding figure from a set of four folded paper figures. An example of this is presented in Figure 4. The inductive test consisted of 40 tasks of number series, with increasing difficulty. Students were asked to fill in the missing numbers in each series. For example: 5, 7, 11, 17, 25, 35, —, —.

Each test variable ranged between 0 and 40. The results of the three tests were combined to create a single variable representing student cognitive ability.

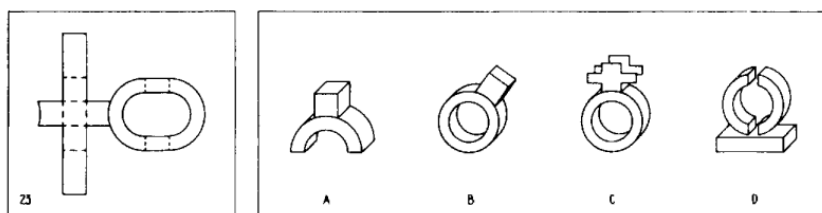


Figure 4. Spatial ability test item

5.3.4 Adult Income

Income was included in Study III and was operationalised by the participants' registered annual income in 2007, when they were 35 years old. By the age of 35, most individuals have started their intended careers and have a stable income. To investigate the robustness of the main relationships, their registered annual income when they were 40 and 45 were also included. The income variable was adjusted for inflation. The income variable included income from employment and business. Values ranged from 0 to 3,331,765 Swedish SEK (mean = 242,360,

standard deviation = 167,673). To improve computational stability, the variable was rescaled by dividing its values by 100,000. The rescaled variable then ranged from 0 to 33.32.

5.3.5 Student Background Variables

To test for possible moderating effects in the models, register data have been utilized, specifically variables of student gender and parental education level. Gender was a dichotomous variable with the values 0 = boy and 1 = girl. Parental education level was operationalised with a variable with five values, ranging from low to high education level: 1 = pre-secondary education, 2 = Vocational preparatory two- or three-year upper secondary education and two-year study preparatory upper secondary education, 3 = Three-year study preparatory upper secondary education and post-secondary education less than two years, 4 = Two or three years of college education, 5 = College education covering four years or more.

5.3.6 Track Affiliation

In Study III, the track selection of students in Grade 9 for mathematics and English was included as a potentially confounding variable. Two variables were created: one representing track affiliation in mathematics, and another representing track affiliation in English. Each variable was coded as follows: 0 = the student attended the general track; 1 = the student attended the advanced track. In mathematics, 30.5% of the students in the sample had selected the general track, while 65.5% had selected the advanced track. In English, 40.4% of the students in the sample had selected the general track, while 55.7% had selected the advanced track.

Table 6. Overview of Manifest Variables

Manifest variable	Study I	Study II	Study III
Mathematics grades	Grades 6, 9	Grade 9	
English grades	Grades 6, 9		
Swedish grades		Grade 9	
Grade point average			Grade 9
Cognitive ability	Grade 6	Grade 6	Grade 6
Gender	Register data	Register data	Register data
Parental education level	Register data		Register data
Track affiliation in math			Grade 9
Track affiliation in English			Grade 9
Adult income			Ages 35, 40, 45

5.4 Analytical Strategy

Different statistical methods were employed to answer the research questions of the thesis; however, they all fall within the statistical framework of structural equation modelling (SEM). Study I was conducted with confirmatory factor analysis (CFA) and latent growth curve analysis (LGCA), Study II was conducted with CFA and multilevel structural equation modelling (MSEM), and Study III was conducted with CFA and SEM.

5.4.1 Structural Equation Modelling

SEM is a modelling framework that incorporates various statistical techniques and estimation methods (Gustafsson, 2009; Kline, 2015). For example, these include CFA, MSEM, LGCA, and multigroup SEM. A standard SEM model comprises two integral parts: the measurement model and the structural model. In the measurement stage of the modelling, the latent constructs under study are estimated using methods such as CFA. In the structural part of SEM, a system of relationships can be specified between latent and/or manifest variables in order to estimate regression coefficients based on covariance structures (Byrne, 2012). Direct and indirect effects, as well as reciprocal relations of both manifest and latent variables, can be estimated (Kline, 2015). As the academic self-concept construct was investigated in all three studies, the SEM framework was suitable for each of the studies. Besides, latent SEM methods have the advantage of

accounting for measurement error in latent variables, as well as allowing complex relationships to be estimated.

In Study III, SEM was used to examine the association between general academic self-concept and income in adulthood. General academic self-concept was modelled as a latent construct and related to registered income at ages 35, 40, and 45. GPA, track affiliation, cognitive ability, gender, and parental education level were included as manifest covariates.

5.4.2 Measurement Models: Confirmatory Factor Analysis and Measurement Invariance

CFA was used to construct measurement models. This makes it possible to measure latent, unobserved phenomena by investigating the relations between observed indicators and a latent factor. Each self-concept factor was theoretically inferred from a set of observed indicators and was assumed to be the cause of the variance in common across the indicators (Brown, 2015; Harrington, 2009). The unique variance of each indicator, that was not explained by the factor, is referred to as the error term (Kline, 2015). The true factor score and the error variance were decomposed into two separate latent variables, thus isolating the true score component of the factor (Brown, 2015). The metric of the latent variables was determined by restricting one of the factor loadings to one, transferring the metric of the indicator to the factor (Bollen, 2002). By default, Mplus selects the indicator specified first as the marker indicator (Muthén & Muthén, 1998-2017).

In Studies I and II, tests of measurement invariance were conducted to determine whether the latent self-concept constructs were invariant, or comparable, across cohorts and time points. Study I involved longitudinal measures of self-concept in mathematics and English in Grades 6, 9, and 12. To test whether the same construct was being measured in all three grades, and to determine whether any differences in the latent variables represented change over time rather than different interpretations of the questionnaire items with age, the invariance of these latent constructs was examined across Grades 6, 9, and 12. In Study II, self-concept in mathematics and Swedish was assessed using a sample comprising three different birth cohorts: 1992, 1998, and 2004. To determine whether the same two latent constructs were being measured across these cohorts, the invariance of the self-concept measures was tested.

Multiple-group confirmatory factor analysis (MGCFA) was used to test measurement invariance. This approach involves comparing the structure of a

construct across specified groups of data by examining three versions of it with increasingly restrictive parameters (Jöreskog, 1971). The first and least restrictive model is the configural invariance model. This model tests whether the pattern of indicators is consistent across groups or time points in terms of free and fixed factor loadings (Putnick & Bornstein, 2016). The second model tests for metric invariance. This model tests whether the indicators load similarly onto the factor across groups or time points (Brown, 2015). The third and most restricted model tests for scalar invariance. It tests whether the intercepts of the indicators are equivalent across groups or time points (Brown, 2015). These three models are then evaluated and compared in terms of how the values of certain goodness-of-fit indices (CFI and RMSEA; see below for further description) change across the models. According to Cheung and Rensvold (2002), invariance assumptions are supported if the model fit of the more restricted models deteriorated by no more than 0.01 compared to the less restricted models.

5.4.3 Latent Growth Curve Analysis

In Study I, latent growth curve analysis (LGCA) was used to examine changes in academic self-concept over time. In LGCA, change is measured through two new latent variables: the intercept variable and the slope variable (Little, 2024). The repeated measures of academic self-concept serve as indicators of the intercept and slope factors. The intercept variable represents the initial mean level of self-concept, while the slope variable represents the average change in mean at each time point. Therefore, a positive slope estimate indicates an increase in self-concept over time, while a negative estimate suggests a decrease. The model described here is referred to as an unconditional model, in that the change over time is not dependent on any predictor. The conditional model includes independent variables to test their relationship with the initial mean level and average change over time. In Study I, students' self-concept in mathematics and English was assessed three times at the following points during adolescence: when they were in Grade 6, Grade 9, and Grade 12. In this study, the development of self-concept during adolescence was investigated in relation to prior achievement, within and across the domains of mathematics and English. Internal and external comparisons were examined using teacher-reported grades in mathematics and English in Grades 6 and 9 as independent variables. A piecewise approach was used, where the change over time was divided into two slopes: one between Grades 6 and 9, and the other between Grades 9 and 12. The first slope variable was

regressed on Grade 6 achievement, and the second on Grade 9 achievement. This model fitted the data better than the standard, non-piecewise approach. The LGCA method allows growth trajectories to be investigated over time, as well as individual differences in these trajectories. This was therefore a suitable way to study how self-concepts in mathematics and English develop in relation to prior achievement within and across the two subjects.

5.4.4 Multilevel Structural Equation Modelling

Multilevel structural equation modelling (MSEM) is a statistical technique within the SEM framework that allows the study of relationships between latent and/or manifest variables on multiple levels simultaneously (Hox et al., 2018). As the BFLPE involves contextual effects and data at both the student and group levels, the MSEM approach was suitable. The sampling procedure for the UGU data was based at school level (Härnqvist, 2000). Students sampled from the same school may have been influenced by the same teachers and school characteristics. Their attitudes and abilities may therefore differ systematically from those of students in other schools, who have been influenced by different teachers and school characteristics.

This creates nested structures in the data, where certain variables can differ significantly between schools. If the nested structure in the data is not accounted for, standard errors may be biased, often underestimated, which can increase the risk of incorrect statistical conclusions (Kline, 2015). Intraclass correlation (ICC) provides information on the extent to which individuals within groups resemble each other and differ from those in other groups (Hox et al., 2018). The ICC statistic ranges from 0 to 1, with a value above 0.05 indicating that the variance is sufficiently clustered to require the variance between groups to be taken into account (Muthén & Satorra, 1995). This is done by specifying the variable at the group level (Heck & Thomas, 2020). The variance within and between groups is then decomposed into two latent variables, meaning that they can be considered separately.

In Study II, student achievement, academic self-concept, and cognitive ability were considered at the individual level. At the group level, school-average achievement and academic self-concept were considered. At each level, the relationship between academic achievement and self-concept was estimated. The contextual BFLPE was then calculated as the difference between the two relationships. Specifically, it was calculated by subtracting the individual-level

relationship from the between-level relationship. This illustrates the expected difference in academic self-concept among students with equal academic achievement, but who attend schools with a one-unit difference in average achievement (Raudenbush & Bryk, 2002).

The specific purpose of Study II was to examine the bright-student hypothesis using a measure of cognitive ability. Cognitive ability was therefore included as a moderator of the BFLPE. In other words, to investigate whether the negative contextual relationship between school-average achievement and individual academic self-concept differed depending on students' individual cognitive ability.

5.4.5 Model Evaluation

The models were evaluated using chi-square tests and global model fit indices to assess how well the model fitted the data. As measures of global model fit, the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Standardized Root Mean Square Residual (SRMR) were assessed. These fit indices represent two types of model assessments, absolute and incremental (or comparative) assessments. RMSEA and SRMR are two examples of absolute fit indices, and they are descriptive evaluations of the degree of misspecification in a model (Curran et al., 2003). RMSEA and SRMR both range from 0 to 1, and values below .08 are often interpreted as indicating acceptable or good model fit, although these thresholds should not be treated as absolute criteria (Hu & Bentler, 1999). CFI, on the other hand, is an example of an incremental fit index. CFI evaluates a model by comparing it to a more restricted baseline model in which the variables are assumed to be uncorrelated (Hu & Bentler, 1999). CFI values range from 0 to 1, where higher values indicate that the target model has substantially better fit to the data than the baseline model. Values above .90 are often considered to indicate acceptable model fit, and values above .95 as good model fit (Hu & Bentler, 1999).

In Studies I and II, the invariance of the latent constructs across groups and time points was tested by evaluating changes in the CFI and RMSEA values between the configural, metric, and scalar models. For scalar invariance to be supported, the fit of the scalar model should not deteriorate substantially compared to the less constrained metric model. Common guidelines suggest that CFI and RMSEA may deteriorate by no more than 0.01 for a measurement model to demonstrate scalar invariance (Cheung & Rensvold, 2002; Putnick & Bornstein, 2016; Rutkowski & Svetina, 2014).

5.5 Missing Data, Weights, and Software

In all three studies, missing data needed consideration. Studies I and II included data from the 2004 cohort, for which the data collection in Grade 6 coincided with the implementation of the national tests. Due to these time constraints, some teachers did not distribute the UGU material to the students. Data were thus missing to a greater extent in cohort 2004 compared to previous cohorts. Additionally, because of its longitudinal design, the 2004 cohort analysed in Study I requires particular attention. It involves missing data due to attrition across Grades 6, 9, and 12. Of the final sample of 9,437 students in Study I, about 620 students participated at all three measurement occasions, about 1,700 participated two times, about 4,100 participated one time, and about 3,000 did not participate at all. As a default, those who did not participate at all were excluded from the analysis.

In all three studies, missing data were taken into account by using the estimation method of full information maximum likelihood (FIML). With the FIML approach, all available data were used to estimate a likelihood function for each individual in the dataset (Muthén et al., 1987). In other words, FIML utilises the information from auxiliary variables included in the model, such as gender, to adjust the model estimates and standard errors (Little, 2024). Assuming that data are missing at random (MAR), i.e., when missingness depends on known variables, FIML produces less biased estimates than methods such as listwise deletion, provided that auxiliary variables are available (Little, 2024). FIML is a default function in Mplus (Muthén & Muthén, 1998-2017). For Study I, this means that all available information was included in the analysis, even if there was not data for every occasion per individual.

In addition to missing data modelling in Mplus, the analyses were run using a calibration weight estimated by Statistics Sweden. The purpose of the calibration weight is to keep the sample as representative of the population as possible, despite missing data. It reduces bias due to non-participation or non-response, namely, when students have not answered either the whole questionnaire, or specific questions. In the calibration weight, individual weights of students have been estimated by taking auxiliary variables into account, such as grades (Särndal, 2007). Specifically, Statistics Sweden create the calibration weight by performing a missing data analysis, based on the following information: gender, country of birth, parental education level, grades, and region (city, suburban municipality, or small city). This compensates for bias caused by differences in response rates, for

example between boys and girls (Härnqvist, 2000). The calibration weight calculated for Grade 6 was used in all three studies. Currently, it is not possible to use more than one weight in Mplus (Muthén & Muthén, 1998-2017). This restricts its use in studies involving data from multiple time points, such as Studies I and II.

In all three studies, data management and descriptive statistics were conducted using version 29 of the IBM SPSS Statistics software. The main analyses were conducted using Mplus version 8.11 (Muthén & Muthén, 1998-2017). Thus, Mplus was used for CFA, measurement invariance testing, LGCA, MSEM, and SEM.

5.6 Reliability, Validity, and Methodological Limitations

To establish good research quality, questions of reliability and validity have been considered throughout the thesis. In terms of the reliability of the measures used in the three studies, the focus has primarily been on assessing the reliability of the latent variable scales, that is, whether students' responses were consistent across the selected questionnaire items (Kline, 2015). This was achieved by examining the internal consistency of the measures using Cronbach's alpha coefficient (Kline, 2015). A measure has high internal consistency when students' responses are consistent across items. For example, this would be demonstrated by a student reporting similar levels of academic self-concept for each item. This indicates high scale reliability. Cronbach's alpha coefficients range from 0 to 1. Values above 0.70 are generally considered acceptable and those above 0.80 are considered good (Cho & Kim, 2015). In Study I, Cronbach's alpha coefficients were examined for self-concept in mathematics and English in Grades 6, 9, and 12. The internal consistency was high for both measures across the time points, indicating high scale reliability. Specific reliability coefficients were reported in Study I. In Study II, Cronbach's alpha coefficients were examined for self-concept in mathematics and Swedish in Grade 9, as well as for cognitive ability test assessments in Grade 6. The results indicated acceptable to good internal consistency, and thus adequate to high scale reliability. Specific reliability coefficients were reported in Study II. In Study III, the internal consistency was examined only for the general academic self-concept measure in Grade 6. The results showed that the measure had acceptable internal consistency and thus adequate scale reliability. Specific reliability coefficients were reported in Study III.

Turning to validity, assessments of good research validity can be divided into four parts: construct validity, internal validity, external validity, and statistical conclusion validity. Construct validity refers to whether the measurements capture what is theoretically intended (Shadish et al., 2002). In each study, this was considered in the process of constructing the theoretically informed measurement models of academic self-concept. These processes were theoretically driven and evaluated using CFA. In Studies I and II, the comparability of the subject-specific self-concept measures was further examined using tests of measurement invariance. In Study I, measurement invariance was tested to examine whether the measures of mathematics and English self-concept were comparable for students across Grades 6, 9, and 12. Support for measurement invariance indicated that the differences observed over time could be interpreted as developmental change rather than changes in the functioning or interpretation of the items. In Study II, it was tested whether mathematics and Swedish self-concept measures were comparable for ninth-grade students across the 1992, 1998, and 2004 cohorts. These measurement invariance tests supported the comparability of the measures across the grades and cohorts of the two studies.

Internal validity, referring to whether the design and methods allow unbiased answers to a certain question (Shadish et al., 2002), has been relevant to consider throughout the studies. The internal validity was limited by the observational design of the three studies. All three studies have longitudinal elements, especially Studies I and III, with data from multiple times during students' schooling. However, as the outcomes may have been affected by unknown variables, this does not prove causality. With the methods that have been employed in the three studies, no causality can be claimed.

The external validity of the studies refers to whether the findings of the studies can be generalised to the respective population of the sample investigated (Shadish et al., 2002). This was primarily considered in relation to the representativeness of the samples used in the studies. By using large and representative samples in each study, the external validity of the findings was strengthened. However, issues with missing data due to non-participation may result in biased results. FIML and calibration weights were used to reduce potential bias (Särndal, 2007).

Questions of statistical conclusion validity concern statistical power and measurement unreliability, which could affect the correctness of the conclusions. Specifically, do the findings exist in the population and are the measurement errors of the constructed measures within limits? In the three studies, the use of large

sample sizes, latent-variable models based on multiple indicators, and model fit evaluation strengthened the statistical conclusion validity of the studies.

The three studies are subject to several limitations concerning the data, design, and methods. As different operationalisations of academic self-concept have been used in all studies, the possibility of making comparisons across studies is limited. In Study I, missing data due to attrition may have introduced bias in student responses, despite the use of FIML and calibration weights. In addition, the outcome of Study III is adult income, which was used as a proxy for accomplishments in adulthood. However, income alone does not provide a complete picture of an individual's life and achievements. For example, factors like wealth and occupational status are not a part of the study. Overall, the observational design of the studies makes it difficult to establish causality. The study-specific methodological limitations are further discussed in each study.

5.7 Ethical Considerations

The three studies were conducted in line with good research practices (Swedish Research Council, 2024). This means that data, methods, results, and interpretations of results have been presented in a transparent and accurate manner, while at the same time protecting the confidentiality of the participants. Each study in the thesis was based on already collected questionnaire, test, and register data. The data collection was handled by Statistics Sweden. The Mplus analysis code was made available for Studies I and II.

Researchers who use the data cannot identify participants of the UGU study. To work with UGU data, it is required that the researcher apply for the specific variables of interest. Requests to work with all variables for a cohort, including all available register data, will be denied. This limits the risk of identification of the participants. In Study III, which involved register data on participants' income in adulthood, data were handled and analysed in Statistics Sweden's platform for accessing microdata (MONA). Thus, data files containing register data were not stored directly on the research's computer. Statistics Sweden handled the register data, for example, by linking it with the UGU questionnaire data before researcher access was granted.

The results of the three studies were presented at group level. In other words, the results were not reported for specific individuals, but in aggregated form. When investigating individual differences in the data, the focus was on differences between groups of students. As the thesis did not involve the processing of

variables classified as sensitive personal data, as defined by the Swedish Ethical Review Authority, none of the three studies underwent ethical review. This assessment was made in relation to the applicable Swedish regulations and data access procedures.

The use of artificial intelligence tools in academic writing is a relatively new practice, and regulations and standards for their use have yet to be fully established. Some sections of this thesis were language-edited using ChatGPT (OpenAI, 2025) and DeepL for grammar, wording, and clarity. These tools were not used for data analysis, interpretation of results, or generation of empirical findings. The author is solely responsible for the content, interpretation, and conclusions presented in the thesis.

Chapter 6 Results and Discussion

This chapter presents and discusses the results of the three studies in relation to the themes of the thesis. The main findings of the thesis are centered around the formation and development of academic self-concept, and its associations with later outcomes. This chapter is organised around these three themes, and aims to discuss the two overarching research questions of the thesis:

1. How do subject-specific academic self-concepts form and develop in relation to internal, external, and social comparison processes?
2. How is general academic self-concept in compulsory school associated with outcomes in adulthood?

6.1 The Formation of Academic Self-Concept

Previous research has shown that academic self-concept forms not only in relation to students actual knowledge of their abilities, but also in relation to different standards of comparison, also called frames of reference (Marsh, 1986; Marsh, Abduljabbar, Morin, et al., 2015; Shavelson et al., 1976). Social comparisons, domain comparisons, temporal comparisons, and absolute comparisons are some of these frames of reference that provide students with information about their relative ability in a subject, which may deviate more or less from their actual ability. In the present thesis, Study I investigated internal and external comparisons, while Study II investigated social comparisons.

6.1.1 Internal and External Comparisons

The findings identified in Study I support the hypotheses of the internal/external (I/E) frame-of-reference model (Marsh, 1986). Mathematics achievement was positively related to mathematics self-concept, and English achievement was positively related to English self-concept. This suggests that, the higher a student performs in a subject, the more positive perception the students will have of their abilities in the subject. Conversely, negative relationships were identified between academic achievement and self-concept across the two subjects. Mathematics achievement was negatively related to English self-concept, whereas English

achievement was negatively related to mathematics self-concept. This suggests that relative to students with similar performance in English, those who achieved high in mathematics tended to have a lower self-concept in English. Similarly, for students who performed on the same level in mathematics, those who achieved high in English tended to have a lower self-concept in mathematics. The correlation between mathematics and English self-concept was also substantially weaker than the correlation between mathematics and English achievement, indicating that students' self-concepts were more independent of each other in comparisons with achievement. In other words, students who perform well in one subject also tend to perform well in other subjects, but the same does not appear to be true for self-concepts. A student may perform well in two subjects but have different self-concepts.

These results can be interpreted in accordance with the I/E model. Students seem to evaluate their mathematical and English abilities by assessing past experiences in the subjects, with feedback such as grades and test results (Marsh et al., 2024). Students also seem to use their performance in other subjects as a frame of reference for how they perceive their ability in a given subject (Marsh et al., 2024). This means that despite the strong correlation between mathematics and English achievement, the same mechanism does not apply to self-concepts. These results were consistent with previous research (see, for example, Chiu, 2012; Möller et al., 2006, 2011; Schmidt et al., 2018).

Furthermore, Study I showed that these comparison processes were not only related to levels of self-concept, but also to trajectories of mathematics self-concept in later adolescence. Mathematics achievement in Grade 9 was positively related to change in mathematics self-concept between Grades 9 and 12. English achievement in Grade 9 was negatively related to change in mathematical self-concept between Grades 9 and 12, but neither achievement variable was related to change in English self-concept. This indicates that students who performed well in mathematics in Grade 9 had a more positive growth trajectory in later adolescence than their lower-performing peers. However, those who performed well in English experienced a more negative growth trajectory in their mathematics self-concept than those who performed less well in English. These findings suggest that achievement and self-concept in mathematics seemed to have enhanced each other. In mathematics, higher-achieving students thus had a more favourable self-concept development in comparison to lower-achieving students. In contrast, higher-achieving students in English showed negative changes in mathematics self-concept in comparison to lower-achieving students. Thus, it seems that the initial

advantages and disadvantages each become more pronounced in students' mathematics self-concept over time. The results also suggest that self-concept in different subjects may develop in different ways in relation to prior achievement. The development of students' self-concept in mathematics appears to follow the same pattern as that hypothesised by the I/E model, but not in English. However, in the same model, the classic I/E pattern of relationships was observed for initial self-concept levels in Grade 6. In other words, positive relationships were identified between achievement and self-concept within the two subjects, while negative relationships were identified across subjects. These findings suggest that internal and external comparisons play a role in shaping the mean level of academic self-concepts, but also the growth trajectory of mathematics self-concept during later adolescence. Thus, the longitudinal findings were domain-specific. While the I/E pattern was evident for self-concept levels in both mathematics and English, this pattern was only observed in the development of mathematics self-concept. The development of students' mathematics self-concepts appeared to be more sensitive to prior internal and external comparisons than the development of their English self-concepts. This may suggest that self-concepts in mathematics are more stable over time in relation to prior achievement, whereas self-concepts in English may develop in relation to other factors. Although English achievement was related to English self-concept levels, it did not appear to enhance or reduce subsequent development in English self-concepts. For these findings, students' cognitive ability, gender, and parental educational level were controlled for.

Students appear to have distinct perceptions of their abilities in different subjects already in Grade 6. These subject-specific perceptions were related to achievement both within and across subjects. This is in line with findings of previous research, which has shown that self-concept in mathematical and verbal domains may develop in different ways and become more differentiated with age (Jacobs et al., 2002; King & McInerney, 2014; Marsh & Ayotte, 2003; Wan et al., 2023). For mathematics self-concept, developmental change during adolescence was related to prior achievement in both mathematics and English. In other words, internal and external comparisons based on Grade 9 achievement remained relevant for the development of mathematics self-concept. English self-concept levels also followed the internal and external comparison pattern, but later change was not clearly related to prior achievement. The findings of Study I suggest that similar comparison processes are related to self-concept levels in both subjects, but that their relevance for the development of self-concept may differ between subjects.

6.1.2 Social Comparisons in School Contexts

Study II investigated the BFLPE in the domains of mathematics and Swedish using multilevel models that distinguish individual achievement from school-average achievement. The BFLPE analyses were carried out separately for each subject domain. Thus, school-average mathematics achievement was paired with self-concept in mathematics, and school-average Swedish achievement was paired with self-concept in Swedish. Statistically significant BFLPEs were observed in both domains. These findings indicate that students with the same level of individual achievement had different self-concepts depending on the average achievement level of their school. That is, students who attended schools with higher average achievement in mathematics or Swedish had lower self-concept in these subjects than students with similar levels of individual achievement who attended lower-achieving schools. These findings are consistent with previous BFLPE research (see, for example, Basarkod et al., 2023; Televantou et al., 2021) and suggest that students' academic self-concepts are related to the achievement level of their peers. In other words, social comparisons provide students with information about how their abilities compare to those of their peers, and this information may serve as a frame of reference for them to evaluate their abilities. This information appears to go beyond the information they receive about their measured achievement in a subject, often provided by achievement indicators such as tests or grades (Marsh, 1984). The BFLPE has been extensively studied in countries that employ different forms and levels of ability-grouping, such as Germany, Australia, and the United States (see, for example, Dicke et al., 2018; Trautwein et al., 2009). The findings of Study II indicate that social comparisons play a role in forming academic self-concepts in the Swedish context too, despite the absence of formal ability tracking or grouping in compulsory schooling. However, the difference in average achievement between schools in Sweden may provide students with a similar frame of reference as that created by ability grouping, although there is achievement variation within schools in Sweden.

Taken together, the results of Study II support the notion that academic self-concept formation is related to contextual factors and that social comparisons may be a part of students' ability evaluations.

6.1.3 Cognitive Ability and the Bright-Student Hypothesis

Study II showed that the contextual BFLPE in the mathematics domain varied according to students' individual cognitive ability. However, the BFLPE did not

vary in the Swedish domain. In other words, the results suggested that students' cognitive abilities, as assessed in Grade 6, moderated the negative relationship between school-average mathematics achievement and individual mathematics self-concept. In mathematics, the negative relationship between school-average achievement and individual self-concept appeared to be weaker among students with higher cognitive ability. Although it has been argued that the BFLPE is stable across students regardless of their individual achievement or ability levels (Marsh et al., 2021), the bright-student hypothesis suggests that students with higher achievement or ability are less affected by social comparison and therefore less affected by the negative BFLPE (Marsh & Basarkod, 2023). Some studies have found support for the bright-student hypothesis (X. Chen, 2022; Marsh et al., 2009; Roy et al., 2015), while other studies have not (Dicke et al., 2026; Marsh et al., 2021).

The findings of Study II suggest that individual cognitive ability may buffer the negative relationship between school-average achievement and self-concept in mathematics. Students with higher cognitive ability seemed less negatively affected by high-achieving peer contexts in mathematics than students with lower cognitive ability. However, the bright-student hypothesis appears to be subject-specific. Students may evaluate and perceive their abilities differently across subjects, and variables such as cognitive ability may thus have different functions in mathematics and Swedish. For example, Leslie et al. (2015) and Chestnut et al. (2018) discuss the widely held belief that only those with a natural aptitude can excel in mathematics. However, findings have shown that, although this view exists in several subjects, it is less prevalent in language subjects than in mathematics (Leslie et al., 2015). It is possible that because of the view of natural mathematics aptitude, cognitive ability may play a greater role in shaping students' self-concepts in mathematics than in verbal domains.

Taken together, the findings of Studies I and II indicate that academic self-concept formation is a complex process that includes multiple frames of reference involving internal, external, and social comparisons. The findings of Study I and Study II also indicate that academic self-concept formation may differ across different subjects. This points to the possibility that academic self-concept formation may be more subject-specific than a general interpretation would suggest.

6.2 Development of Academic Self-Concept During Adolescence

Overall, previous research has shown that students' academic self-concepts tend to decline during adolescence. As students get older, they may experience an increased pressure to perform while simultaneously experiencing increased testing and more difficult grading criteria. However, some studies indicate that academic self-concept may develop differently across subjects. The following sections discuss the development of self-concept in mathematics and English, individual differences in these trajectories, and implications of this for self-concept development in general.

6.2.1 Domain-Specific Development in Mathematics and English

Study I examined the development of self-concept in mathematics and English. Both constructs were assessed in Grades 6, 9, and 12. Development was examined across two intervals: from Grade 6 to Grade 9, and from Grade 9 to Grade 12. Initially in Grade 6, students reported somewhat lower levels of self-concept in mathematics compared to English. The subsequent growth trajectories indicated that self-concept development was subject-specific. In mathematics, students' self-concept declined from Grade 6 to Grade 9, after which it remained relatively stable until the final year of upper secondary school. In English, students' average self-concept increased from Grade 6 to Grade 9, but the average level declined slightly by Grade 12. Across all three measurement points, students reported lower self-concepts in mathematics than in English. These results are partly in line with previous research, showing that academic self-concept declines with age (Jacobs et al., 2002; Nagy et al., 2010). The results are also consistent with previous studies that indicate an increased subject-specific differentiation in self-concepts during adolescence (Fang et al., 2018; Marsh, Abduljabbar, Morin, et al., 2015).

Study I indicated that the adolescent trajectories of mathematics and English self-concept followed different developmental patterns. The decline in mathematics self-concept during secondary school may partly reflect the accumulated feedback in the subject, through repeated positive and negative learning experiences. In addition, increased subject-specific differentiation may be linked to more differentiated comparison processes. It has also been found that negative contextual effects become stronger as students age, which indicates

increased social comparison (Fang et al., 2018; Marsh, Abduljabbar, Morin, et al., 2015). However, English self-concept followed a different pattern, indicating that different developmental processes may be involved in different subjects. The increase during secondary school, followed by a slight decline, indicated that not all academic self-concepts follow a general downward trend.

Overall, mathematics self-concept showed a developmental decline during secondary school. Students' self-concept in mathematics may be more sensitive to achievement feedback and comparisons during secondary school. Furthermore, the study provided support for increased differentiation in self-concept between subjects.

6.2.2 Individual Differences in Self-Concept Trajectories

Study I showed individual differences in the trajectories of mathematics and English self-concept. These differences indicated that students followed different developmental patterns during adolescence, suggesting that additional factors should be considered. Together with teacher-reported grades in mathematics and English, students' cognitive ability, gender, and parental education level were therefore included in the model. Cognitive ability was positively related to initial mathematics self-concept in Grade 6. This suggested that, when the other independent variables, such as grades, were held equal, students with higher cognitive ability tended to have higher mathematics self-concept. This initial difference due to cognitive ability remained evident until Grade 9. However, cognitive ability was negatively related to change in mathematics self-concept from Grade 9 to Grade 12. This suggests that students with higher cognitive ability showed a more negative change in mathematics self-concept during upper secondary school. Cognitive ability was not associated with self-concept levels or trajectories in English. Girls reported lower initial self-concept levels in both mathematics and English than boys. These gender differences observed in Grade 6 remained stable throughout adolescence in both subjects. Thus, when achievement, cognitive ability, and parental education were accounted for, girls had lower self-concept in both mathematics and English than boys. Parental education level was primarily related to the growth trajectory of English self-concept between Grades 6 and 9. In addition, a relatively weak positive association was identified between parental education level and the growth trajectory of mathematics self-concept from Grade 6 to Grade 9. These findings suggest that

students with higher parental education levels experienced slightly steeper increases in their self-concepts than those with lower parental education levels.

These results are partially consistent with those of previous studies in the field. Studies have found that girls report lower levels of self-concept in mathematics than boys (Arens et al., 2017; Wang & Yu, 2023; Zander et al., 2020), and higher levels in verbal subjects (Arens & Jansen, 2016; Marsh & Yeung, 1998; Plieninger & Dickhäuser, 2015). In mathematics, these results are in line with those observed in Study I. However, in the English domain, the results of Study I differ from previous research. In terms of parental educational background, the results are similar to those of previous studies (Horoz et al., 2025). One possible explanation of this relationship is that parents with higher education may provide resources and support that are relevant for children's academic self-perceptions.

Taken together, cognitive ability, gender, and parental education level were related to some of the individual variation in the developmental trajectories of mathematics and English self-concept. Cognitive ability was related to self-concept levels and trajectories in mathematics. Gender and parental education level were related to some aspects of self-concept levels and trajectories in both subjects. These findings suggest that students with similar achievement may evaluate their academic abilities differently and develop different self-concepts. Individual characteristics thus appeared to be related to how students perceived themselves academically.

6.2.3 Implications for Understanding Self-Concept Development

During adolescence, mathematics and English self-concept showed different developmental trajectories, which involved individual variation among students. Individual factors and characteristics, such as achievement, cognitive ability, gender, and parental education level, were related to certain aspects of self-concept development. The developmental patterns of the two subjects indicated that students with similar achievement levels may still report different levels of self-concept. This reflects the complexity of academic self-concept development, involving both comparison processes and individual characteristics. The relevance of internal and external comparisons for self-concept development varied across the subjects. Internal and external comparisons appeared to be relevant for the development of mathematics self-concept, but less clearly for English self-concept. Overall, the development of mathematics self-concept appeared to be

more sensitive to achievement, cognitive ability, and gender than English self-concept was.

6.3 Academic Self-Concept and Long-Term Associations

Previous research has demonstrated that academic self-concept is positively associated with subsequent educational choices and outcomes, such as course selection and educational attainment. Subject-specific self-concept, such as mathematics self-concept, tends to be positively associated with the selection of courses related to that subject (Lazarides et al., 2020). General academic self-concept, on the other hand, has been investigated in relation to overall levels of educational attainment (Guay et al., 2004). Results have shown that higher levels of general self-concept are linked with higher educational attainment. However, few studies have examined outcomes beyond the academic sphere.

6.3.1 Academic Self-Concept and Adult Income

The findings of Study III indicated that general academic self-concept, assessed in Grade 6, was positively associated with registered income at age 35. The positive association was also identified for income registered at ages 40 and 45. Achievement, track affiliation, cognitive ability, gender, and parental education level were included as covariates in the model. Thus, after accounting for grades, track affiliation, cognitive ability, gender, and parental education level, students with higher general academic self-concept tended to have higher registered income in adulthood. This finding is in line with previous studies investigating academic self-concept and long-term educational and labour-market associations. Hansen et al. (2023) investigated the relationship between general academic self-concept and employment and income at age 25. Although academic self-concept was indirectly related to these factors, through college and higher education variables, no direct associations were observed. The findings of Study III build on and extend previous research by examining the relationship between academic self-concept and income at more established stages of adulthood. This may provide a more stable indication of adult economic attainment.

Overall, the findings of Study III suggest that general academic self-concept may be associated with outcomes beyond the educational system. Students' academic self-concept appears to be associated with their adult income

independently from their achievement and gender. However, the design of the study does not allow causal interpretations of the observed relationships.

6.3.2 Interpreting Long-Term Associations

Several previous studies have investigated relationships between academic self-concept and educational outcomes, such as academic achievement, course selection (Marsh & Yeung, 1997b; Nagy et al., 2006), college selection (Jiang et al., 2020; Lazarides et al., 2020), and educational attainment (Guay et al., 2004; Marsh & O'Mara, 2008). Fewer studies have investigated academic self-concept's association with labour-market outcomes, such as income. Additionally, previous studies differ in design and their use of self-concept measures. Studies involving general academic self-concept measures allow investigations of overall levels of attainment. Studies that use subject-specific measures of self-concept, on the other hand, enable investigations of domain-specific educational and occupational pathways. For example, they can examine whether a high self-concept in mathematics is related to subsequent educational and occupational choices in mathematics. However, whether such pathways are associated with later income is a separate empirical question. The general self-concept measure used in Study III was therefore suited to examining overall economic attainment. However, as neither subject-specific self-concepts nor later educational or occupational pathways were included, the findings of Study III do not provide insight into which specific educational or occupational pathways may link early academic self-concept to adult income.

Study III found that sixth-grade general academic self-concept was associated with income registered at ages 35, 40, and 45. The long interval between these assessment points makes the finding noteworthy. However, as observed by Hansen et al. (2023), the relationship between general academic self-concept and adult income is likely to be indirect. In other words, general academic self-concept is positively related to outcomes such as educational attainment (Guay et al., 2004), and educational attainment is positively related to later income (Hansen et al., 2023). Other factors that may link general academic self-concept and income include motivation, effort, educational choice, and occupational pathways.

In addition, adult income should be considered a limited indicator of adult outcomes. Income does not capture occupation, occupational satisfaction, life satisfaction, or well-being.

Although the observational design of the study does not allow causal claims, the overall pattern that emerged in Study III suggests that general academic self-concept may be relevant beyond the educational system. However, further studies of these relationships and their possible mediating pathways are required.

6.4 Summary of the Empirical Findings

The findings of Studies I and II showed that academic self-concepts are related to internal, external, and social comparison processes. These relationships were observed across the subject-specific self-concepts studied (mathematics and English self-concepts in Study I, mathematics and Swedish self-concepts in Study II). Additionally, Study II showed that the relationship between school-average mathematics achievement and mathematics self-concept was moderated by students' individual cognitive ability. Study I further showed that the development of self-concept levels differed across the mathematics and English domains during the adolescent years. In addition, development in each subject related differently to achievement, cognitive ability, gender, and parental education level. The findings of Study III showed that general academic self-concept was associated with income in adulthood after accounting for achievement, track affiliation, cognitive ability, gender, and parental education level.

Taken together, the findings of the thesis provide insight into how academic self-concepts are formed through multiple comparison processes, how they develop during adolescence, and how general academic self-concept is associated with income in adulthood.

Chapter 7 Concluding Remarks

7.1 Empirical Contributions

The thesis provides empirical knowledge about students' academic self-concept. More specifically, it contributes knowledge about the formation, development, and long-term associations of academic self-concept.

The thesis integrates internal, external, and social comparison processes in relation to academic self-concept formation. It extends previous research by examining whether students' individual cognitive abilities moderate the BFLPE in the mathematics and Swedish domains. Previous research has primarily investigated such moderating effects using grades or standardised test results (X. Chen, 2022; Marsh et al., 2009; Roy et al., 2015; Trautwein et al., 2009). By including two subjects, the thesis also contributes empirical knowledge about the subject-specificity of moderation of the BFLPE. The findings showed that individual cognitive ability moderated the BFLPE in the mathematics domain, but not in the Swedish domain. Furthermore, the findings of the thesis extend previous research on internal and external comparison processes in the formation of academic self-concepts by examining mathematics and English as a second-language subject. Previous research has often examined the I/E model using self-concepts in mathematics and students' first language (see, for example, Möller et al., 2014; Skaalvik & Rankin, 1995). However, some studies have included more subjects (Marsh, Lüdtke, et al., 2015; Möller et al., 2006). The findings of the thesis supported the standard pattern of the I/E model.

In terms of development, Study I contributes to understanding the subject-specificity of self-concept development over time. The findings showed that mathematics and English self-concept followed different developmental patterns during adolescence. Furthermore, the thesis extends previous research on internal and external comparison processes by examining the I/E model as a developmental model, rather than as a static model. Previous studies have investigated the I/E model involving longitudinal relations, but few have studied these relationships as within-student change over time (Arens & Niepel, 2023; Möller et al., 2014; Parker et al., 2015). This contributes to the field by integrating

internal and external comparison processes with mathematics and English self-concept development over time. The findings showed that the relevance of internal and external comparisons for self-concept development was subject-specific. Additionally, the thesis showed that the development of mathematics and English self-concept was related to individual characteristics. However, these relationships differed across mathematics and English.

In terms of long-term associations, the thesis contributes empirically by examining register income in adulthood. Academic self-concept has often been investigated as a predictor (see, for example, Guay et al., 2004); however, few studies have examined outcomes beyond the educational system in adulthood (Hansen et al., 2023). The results showed that general academic self-concept was associated with income registered at ages 35, 40, and 45. Study III thus expands previous research by adding empirical evidence on general academic self-concept and long-term economic attainment.

7.2 Methodological Contributions

The thesis makes several methodological contributions to the field of educational psychology, and more specifically to the study of academic self-concept. Across the three studies, academic self-concept was modelled as a latent construct. This approach provided constructs more aligned with the theoretical definition of academic self-concept while allowing measurement error to be modelled separately (Brown, 2015). Additionally, the thesis was based on multiple cohorts of UGU participants. The original cohort samples were designed to be representative of their respective populations.

Study I was based on longitudinal questionnaire data from Grades 6, 9, and 12. In other words, data spanning from early lower secondary school to the final year of upper secondary school (with an approximate age range of 11-12 to 18-19). The longitudinal questionnaire data therefore provided the advantage of following students' academic self-concepts during their adolescent years. As the same self-concept items were used across measurement occasions, latent growth curve methods could be used to investigate changes in students' academic self-concept over time. Additionally, modelling the adolescent trajectories using a piecewise approach offered a more detailed picture of self-concept development, making it possible to examine differences in rates of change between Grades 6–9 and Grades 9–12.

Study II was conducted using multilevel structural equation modelling (MSEM), involving the examination of individual and school-average achievement simultaneously. In recent BFLPE research, MSEM has provided advantages over conventional multilevel modelling (Marsh et al., 2009). For example, it distinguishes between variance within and between schools, allows latent variable modelling, and allows school-level constructs to be estimated as latent variables (Byrne, 2012). Another methodological advantage of Study II was the cognitive ability measure used to study moderation. This measure was based on three different tests that assessed students' verbal, spatial, and numerical abilities. While the combined test result only serves as an indicator of students' cognitive ability, the three tests together provide a broader indicator of ability than a single test would provide.

Study III was conducted using questionnaire data linked to the participants' registered income in adulthood. The design allowed for long-term associations to be analysed in a way that was less vulnerable to issues such as low response rates and bias than with self-reported income data (Mellander, 2017).

7.3 Practical Implications

The findings of the thesis suggest several practical implications. Firstly, students with similar levels of achievement do not necessarily have the same academic self-concept. A variety of factors, including comparison processes and individual characteristics, are related to students' self-concepts. When students use their perceived strengths and weaknesses to form an academic identity, for example by saying 'I am better at verbal subjects than mathematics,' this may have implications for their course choices and educational aspirations in the long-term. The findings of this thesis, as well as those from the field in general, emphasise the significance of prior academic self-concept for subsequent academic pathways, even beyond the educational system. As mathematics self-concept appeared to be particularly sensitive to comparison processes and individual characteristics, the comparison-based formation processes may have negative implications for students' mathematics-related identities and subsequent pathways. Practices aimed at supporting students' academic self-concept are relevant to all students across achievement levels, and particularly in the mathematics subject. From autumn 2028, a new educational reform will be implemented in Sweden (Swedish National Agency for Education, 2026). Standardised tests will be introduced in Grades 1, 2, 3, 5, and 8. Final exams will be implemented in compulsory school for admission

and selection to upper secondary school. In addition, a new grading scale with added scale points will be implemented. It is possible that these changes to the Swedish educational system may increase the visibility of achievement-related information from an early age, which may lead to earlier formation of academic self-concepts. Internal comparisons may thus become even more important to address in the Swedish context, from both a research and teaching perspective.

Secondly, the educational context appears to be related to the formation of students' academic self-concepts. Higher average achievement at school may provide students with a more demanding frame of reference, meaning that social comparisons may play a role in students' academic self-evaluations. This means that students who attend higher-achieving classes or schools tend to form lower academic self-concepts than their equally able peers in relatively lower-performing contexts. This may have a negative impact on subsequent academic achievement and other important educational outcomes. Students attending higher-achieving schools may benefit particularly from efforts to reduce excessive social comparison. Overall, this implication is relevant for parents and children in order to make informed decisions regarding school choice. It is also relevant for policymakers working with the organisation of the Swedish educational system. Efforts to reduce the variation in achievement between schools may also reduce the conditions under which social comparison processes arise. However, the increased focus on achievement in the 2028 educational reforms could make students' relative standing in the classroom more explicit. This may contribute to creating an educational context that enables increased social comparison from a young age.

7.4 Limitations and Future Research

The thesis has several limitations that need to be mentioned. All three studies were observational in nature, meaning that no causal claims can be made based on their results. The findings should therefore be considered as empirical contributions to academic self-concept research, rather than as evidence of causal effects. Similarly, although the findings of the thesis highlight the subject-specificity of academic self-concept formation and development, Studies I and II involved only mathematics, English, and Swedish self-concepts. Further research involving other subject domains and similar extensions of the I/E and BFLPE models is needed to examine subject-specific formation and development in the Swedish context in more detail. The findings of Study I indicated that developmental trajectories of

self-concept differed in mathematics and English. By including a wider range of subject domains, the subject-specificity of self-concept development could be investigated further. This may provide broader knowledge about how students relate their perceived abilities across subject domains through internal comparisons.

In Study II, the BFLPE was investigated among Swedish ninth-grade students across three cohorts. Future research should continue to investigate the BFLPE in the Swedish context using data from students at earlier ages and by examining trends over time. Comparing the BFLPE in subject-specific domains across Grades 6 and 9 would provide a more detailed picture of social comparison and academic self-concept formation in the Swedish context. Such an investigation would shed light on whether school-average achievement is a relevant factor in academic self-concept formation also for younger students. Students in the 2004 and 2010 cohorts of the UGU database received grades from Grade 6, allowing BFLPE estimates to be calculated in both Grade 6 and Grade 9. Additionally, during spring 2026, data from a new UGU cohort were collected, with students born in 2016. For this cohort, academic self-concept was assessed already in Grade 3. This enables an investigation of subject-specific self-concepts in younger students and whether they are formed in relation to contextual effects at this age.

In addition, comparisons of BFLPE estimates across UGU cohorts may provide further knowledge about the stability of the BFLPE over time. Changes in the strength of contextual effects over time may be discussed in relation to possible implications of the educational reforms that have been introduced in the Swedish educational system. In the long term, such investigations may include data from students who experienced the 2028 educational reforms. For example, this may provide insight into academic self-concept formation in a context with increased visibility of achievement-related information from an early age.

One limitation of Study III is the absence of mediating variables, such as educational attainment and occupation. These variables may help explain the observed association between general academic self-concept and adult income. More research examining such mediating pathways is needed. For example, future studies could include upper secondary programme choice, educational attainment, or occupational status as mediating variables. This may provide a more detailed understanding of how general academic self-concept is associated with subsequent economic attainment.

Additionally, more information about how subject-specific self-concepts are associated with educational and occupational pathways in the Swedish context may

complement the research on formation processes. For example, an investigation of the association between academic self-concept and subsequent educational choices in mathematics and Swedish would allow a discussion of the relative importance of subject-specific self-concepts across domains. The findings of the thesis indicated that the development of students' mathematics self-concept appeared to be particularly sensitive to comparison processes and individual characteristics. Future research could therefore examine whether associations between self-concept and course or programme selection differ across subjects.

Svensk sammanfattning

Denna avhandling undersöker akademisk självuppfattning, det vill säga elevers uppfattningar om sin akademiska kompetens. Syftet är att öka förståelsen för hur akademisk självuppfattning formas och utvecklas under skoltiden, och hur den är relaterad till faktorer senare i livet. Elevers uppfattningar om sin akademiska kompetens speglar inte bara deras prestationer i skolan. De formas också i relation till tidigare skolerfarenheter, kamraters prestationer, individuella egenskaper och den undervisnings- och skolkontext som eleven befinner sig i (Bong & Skaalvik, 2003; Marsh et al., 2017, 2024).

Elevers akademiska självuppfattning är viktig både som utfall och som prediktor. Som utfall säger den något om hur elever tolkar den återkoppling och prestationsinformation de möter i skolan, exempelvis i form av betyg, provresultat, undervisning och jämförelser. Som prediktor har akademisk självuppfattning i tidigare forskning kopplats till prestation, engagemang, motivation, kursval, utbildningsvägar och yrkesrelaterade ambitioner (Lazarides et al., 2020; Marsh & Craven, 2006; Marsh & Yeung, 1997b, 1997a). En elevs akademiska självuppfattning kan därför vara relevant för att förstå både hur eleven upplever sin skolgång och vilka vägar hen senare tar.

Avhandlingen utgår från tre forskningsluckor. För det första är det fortfarande oklart om sociala jämförelser, såsom de beskrivs i forskning om big-fish–little-pond-effekten (BFLPE), fungerar på samma sätt för alla elever (Marsh et al., 2008). En alternativ hypotes, här kallad bright-student-hypotesen, föreslår att elever med högre prestation eller förmåga kan vara mindre känsliga för negativa sociala jämförelser, men tidigare resultat är blandade (X. Chen, 2022; Marsh et al., 2009, 2021; Seaton et al., 2009; Trautwein et al., 2009). För det andra finns det mindre kunskap om hur akademisk självuppfattning utvecklas inom elever under ungdomsåren, särskilt i relation till interna och externa jämförelser (Arens & Niepel, 2023; Möller et al., 2011). För det tredje är relationen mellan akademisk självuppfattning och utfall utanför utbildningssystemet, såsom inkomst i vuxen ålder, mindre studerad.

Det övergripande syftet var därför att bredda kunskapen om akademisk självuppfattning genom tre empiriska studier. Studie I undersökte utvecklingen av

självuppfattningar i matematik och engelska från årskurs 6 till årskurs 12 i relation till interna och externa jämförelser. Studie II undersökte BFLPE och bright-student-hypotesen i matematik och svenska, med kognitiv förmåga som modererande variabel. Studie III undersökte den långsiktiga associationen mellan generell akademisk självuppfattning i årskurs 6 och registrerad inkomst i vuxen ålder, samtidigt som bland annat spårtillhörighet i matematik och engelska i årskurs 9 beaktades.

Den svenska utbildningskontexten

Den svenska utbildningskontexten är viktig för tolkningen av avhandlingens tre studier eftersom de bygger på elevkohorter som gått i skolan under olika historiska perioder. Särskilt relevanta är de delar av systemet som rör differentiering, betyg, nationella prov, skolval och skillnader mellan skolor. Dessa aspekter påverkar vilken återkoppling och prestationsinformation elever möter i skolan.

En central historisk aspekt är den spårdifferentiering som infördes i matematik och engelska i högstadiet 1962 och fanns kvar fram till 1994 års läroplan (Marklund, 1985). Elever gick då antingen en allmän eller en särskild kurs i matematik och engelska inom samma skola. Denna kontext är relevant för Studie III, som bygger på elever födda 1972 och inkluderar spårtillhörighet i matematik och engelska i årskurs 9.

År 1994 infördes nya läroplaner och ett mål- och kriterierelaterat betygssystem (Grundskoleförordning, 1994). Runt 2011 genomfördes ytterligare förändringar: betyg infördes från årskurs 6, nationella prov genomfördes i fler årskurser och en sexgradig betygsskala från F till A infördes (National Agency for Education, 2015). För eleverna i 2004 års kohort, som används i Studie I, innebär detta en skolkontext med tidigare betyg och mer frekvent testning. Betyg och provresultat är relevanta eftersom de ger elever information om deras prestationer och därmed kan vara en del av formlandet av akademisk självuppfattning.

Även skolval och skolsegregation är relevanta. Under början av 1990-talet infördes reformer som gav föräldrar och elever större möjlighet att välja skola, samtidigt som fristående skolor blev offentligt finansierade (National Agency for Education, 2012). Dessa reformer har beskrivits som en förskjutning från en välfärdsmodell till en mer marknadsorienterad skolmodell (Fjellman et al., 2019; Lundahl et al., 2013). Senare studier och rapporter har visat ökad segregation mellan grundskolor i fråga om prestation och socioekonomisk bakgrund (Böhlmark et al., 2016; Yang Hansen & Gustafsson, 2016). Detta innebär att

skolors genomsnittliga prestationsnivåer kan skilja sig åt. Denna variation är central för Studie II, eftersom skolgenomsnittlig prestation fungerar som en viktig jämförelseram i BFLPE. Sammantaget gör den svenska kontexten det möjligt att undersöka akademisk självuppfattning i olika utbildningsmiljöer och över längre tidsperioder.

Teoretiska utgångspunkter

Akademisk självuppfattning definieras i avhandlingen som elevers uppfattningar om sin akademiska förmåga. Dessa uppfattningar formas genom erfarenheter av skolan och miljön omkring eleven (Shavelson et al., 1976). Betyg, provresultat, läraråterkoppling och kamraters prestationer kan ge information som elever använder när de bedömer sin egen förmåga (Bong & Skaalvik, 2003; Marsh et al., 2019). Eftersom akademisk självuppfattning bygger på bedömningar av tidigare erfarenheter betraktas den ofta som mer retrospektiv än det snarlika begreppet akademisk self-efficacy, som i större utsträckning handlar om tilltron till att klara specifika framtida uppgifter (Bong & Skaalvik, 2003; Marsh et al., 2019).

Flertalet studier har visat att akademisk självuppfattning är ett multidimensionellt begrepp (Arens et al., 2011; Marsh & Shavelson, 1985). Den kan mätas som en generell akademisk självuppfattning, som fångar elevers övergripande uppfattning om sin förmåga i skolan, eller som en ämnesspecifik självuppfattning, exempelvis i matematik, engelska eller svenska (Marsh & Shavelson, 1985; Shavelson et al., 1976). Den ämnesspecifika nivån är viktig eftersom elever kan prestera väl i flera ämnen men ändå uppfatta sig som starkare i ett ämne än i ett annat (Marsh, 1990b; Marsh et al., 2024).

Formandet av akademisk självuppfattning förstås som en process där flera jämförelseramar verkar samtidigt (Marsh et al., 2024). Sociala jämförelser innebär att elever jämför sin förmåga med andra elevers förmåga. En elevs självuppfattning i matematik är därför inte bara relaterad till den egna prestationen, utan också till hur denna prestation framstår i relation till kamraternas prestationer. Dimensionella eller interna jämförelser innebär i stället att elever jämför sin förmåga i ett ämne med sin förmåga i ett annat ämne (Marsh, 1986; Skaalvik & Rankin, 1990). En elev som uppfattar sig som starkare i matematik än i engelska kan därför utveckla en högre självuppfattning i matematik och en relativt lägre självuppfattning i engelska. Dessa jämförelser bidrar till att självuppfattningar tenderar att bli mer ämnesspecifika över tid (Arens et al., 2011).

Den interna/externa referensramsmodellen, I/E-modellen, förklarar varför prestationer i olika ämnen ofta är starkt relaterade medan självuppfattningar i samma ämnen tenderar att vara mer svagt relaterade (Marsh, 1986). Modellen antar att relationen mellan prestation och självuppfattning är positiv inom samma ämne men negativ mellan ämnen. Hög prestation i matematik är alltså relaterad till högre självuppfattning i matematik, men kan samtidigt vara relaterad till lägre självuppfattning i ett språkämne eftersom eleven jämför sin verbala förmåga med sin förmåga i matematik. På motsvarande sätt kan hög prestation i ett språkämne ämne vara relaterad till lägre självuppfattning i matematik (Möller et al., 2011).

BFLPE bygger på social jämförelseteori och beskriver hur skolans eller klassens genomsnittliga prestationsnivå är relaterad till elevers akademiska självuppfattningar (Festinger, 1954; Marsh & Parker, 1984). Effekten innebär att elever med samma individuella prestation kan ha olika självuppfattningar beroende på prestationsnivån i deras referensgrupp. Hög individuell prestation är vanligtvis relaterad till högre självuppfattning, medan skolans genomsnittliga prestation är relaterad till lägre individuell självuppfattning (Marsh & Basarkod, 2023). Bright-student-hypotesen föreslår att elever med högre prestation eller förmåga kan vara mindre känsliga för denna negativa kontextuella relation (Marsh & Basarkod, 2023). I avhandlingen prövas detta med kognitiv förmåga som mått.

Akademisk självuppfattning är både ett utfall och en prediktor. Som utfall visar den hur elever bearbetar och tolkar den prestationsinformation som finns omkring dem. Som prediktor är den relaterad till senare faktorer som prestation, motivation, kursval och utbildningsvägar (Arens et al., 2017; Marsh & Craven, 2006). Samtidigt är självuppfattning inte statiskt. Elever får kontinuerligt ny återkoppling genom betyg, prov, undervisning och jämförelser, och kan därför omvärdera sin uppfattning om sin förmåga över tid. Avhandlingen utgår från denna dubbla roll: självuppfattning formas av tidigare och nuvarande erfarenheter men är också relaterad till framtida vägar (Marsh et al., 2024).

Tidigare forskning

Tidigare forskning har i stor utsträckning visat att akademisk självuppfattning formas i relation till prestation. Inom BFLPE-forskningen undersöks detta genom att skilja mellan individuell prestation och gruppens genomsnittliga prestation. På individnivå är relationen mellan prestation och självuppfattning vanligtvis positiv. På gruppnivå är relationen ofta negativ: elever i skolor eller klasser med högre genomsnittlig prestation tenderar att ha lägre självuppfattning än lika

högpresterande elever i lägre presterande miljöer (Basarkod et al., 2023; Marsh, Abduljabbar, Morin, et al., 2015; Televantou et al., 2021). Detta tolkas som ett uttryck för negativa sociala jämförelser.

BFLPE har visat sig vara ett robust fenomen i flera länder, åldersgrupper och ämnen (Basarkod et al., 2023; Marsh, Abduljabbar, Morin, et al., 2015). Samtidigt finns det osäkerhet kring om effekten är lika stark för alla elever. Forskningen om bright-student-hypotesen har gett blandade resultat. Vissa studier tyder på att högpresterande elever påverkas mindre negativt av högpresterande miljöer, medan andra studier inte finner sådana skillnader (X. Chen, 2022; Marsh et al., 2009; Seaton et al., 2009; Trautwein et al., 2009). Dessutom har tidigare studier oftast använt betyg eller standardiserade testresultat som mått på prestation eller förmåga. Detta gör det relevant att undersöka hypotesen med kognitiv förmåga som alternativt mått.

Även I/E-modellen har starkt empiriskt stöd (Marsh, 1986; Möller et al., 2011, 2014). Studier visar ofta positiva samband mellan prestation och självuppfattning inom samma ämne och negativa samband mellan prestation i ett ämne och självuppfattning i ett annat. Detta tyder på att elever använder dimensionella jämförelser när de formar sina ämnesspecifika självuppfattningar. Elever skiljer alltså mellan sina förmågor i olika ämnen, även när deras prestationer i ämnena är starkt relaterade (Parker et al., 2015).

Forskning om utvecklingen av akademisk självuppfattning över tid visar att självuppfattning i genomsnitt tenderar att minska under ungdomsåren (Jacobs et al., 2002; Nagy et al., 2010; Wigfield et al., 1997). Detta kan förstås i relation till ökade prestationskrav, mer frekvent testning och betygsättning samt ökade jämförelser med andra elever. Samtidigt verkar elevers relativa position vara relativt stabil: elever med hög självuppfattning i förhållande till sina kamrater vid en tidpunkt tenderar ofta att ligga relativt högt även senare (Scherrer et al., 2023).

Självuppfattningar blir också mer ämnesspecifika med åldern. Yngre elever har oftare en mer generell uppfattning om sin skolkompetens, medan äldre elever i större utsträckning utvecklar separata självuppfattningar i olika ämnen (Marsh, 1990b; Marsh & Shavelson, 1985). Detta hänger samman med att elever får mer ämnesspecifik återkoppling och fler erfarenheter som gör det möjligt att jämföra den egna förmågan mellan ämnen (Bong & Skaalvik, 2003). Forskning som kopplar dessa jämförelseprocesser till självuppfattningens utveckling över tid är dock fortfarande begränsad (Arens & Niepel, 2023; Parker et al., 2015).

Akademisk självuppfattning har också studerats som prediktor för senare utfall. Tidigare forskning visar att den är positivt relaterad till prestation, motivation,

engagemang, skolattityder, intresse, kursval och utbildningsnivå (Guay et al., 2004; Marsh & Craven, 2006; Marsh & O'Mara, 2008). Ämnesspecifik självuppfattning har studerats i relation till fortsatta val inom samma ämnesområde (Marsh, 2023), medan generell akademisk självuppfattning har studerats i relation till övergripande utbildningsnivå (Nagy et al., 2006). Färre studier har undersökt relationen till arbetsmarknadsrelaterade utfall, som yrke och inkomst (Hansen et al., 2023). Det finns därför ett behov av studier som följer individer längre in i vuxenlivet, när utbildnings- och arbetsmarknadsvägar har blivit mer etablerade.

Metod

Avhandlingen består av tre empiriska studier som använder longitudinella enkätdata i kombination med test- och registerdata. Studie I undersöker formande och utveckling av självuppfattning i matematik och engelska. Studie II undersöker sociala jämförelser och BFLPE i matematik och svenska. Studie III undersöker långsiktiga associationer mellan generell akademisk självuppfattning och inkomst i vuxen ålder.

Alla analyser bygger på data från den svenska longitudinella infrastrukturen Utvärdering Genom Uppföljning, UGU (Härnqvist, 2000). UGU innehåller nationellt representativa urval av svenska födelsekohorter som samlats in ungefär vart sjätte år. I avhandlingen används kohorterna födda 1972, 1992, 1998 och 2004. Enkätdata kompletteras med kognitiva test i årskurs 6 och registerdata om bland annat kön, föräldrars utbildningsnivå, betyg och nationella prov. I Studie III kopplades UGU-data till databasen Gothenburg Educational Longitudinal Database (GOLD), vilket gjorde det möjligt att analysera registrerad inkomst i vuxen ålder.

Studie I baserades på 2004 års kohort och innehåller enkätdata från årskurs 6, 9 och 12 samt betyg i matematik och engelska från årskurs 6 och 9. Studie II baserades på de sammanslagna kohorterna 1992, 1998 och 2004. Där ingår mått på självuppfattning och betyg i matematik och svenska i årskurs 9 samt kognitiv förmåga från årskurs 6. Studie III baserades på 1972 års kohort och innehåller generell akademisk självuppfattning i årskurs 6, spårtillhörighet och meritvärde i årskurs 9 samt registrerad inkomst vid 35, 40 och 45 års ålder.

Akademisk självuppfattning operationaliserades som en latent variabel i alla tre studier, men måtten skiljde sig åt. Studie I använde ämnesspecifika mått på självuppfattning i matematik och engelska. Studie II använde ämnesspecifika mått i matematik och svenska. Studie III använde ett mått på generell akademisk

självuppfattning. Övriga centrala mått var betyg, meritvärde, kognitiv förmåga, inkomst, kön, föräldrars utbildningsnivå och spårtillhörighet i matematik och engelska. Att modellera självuppfattning som latent variabler gjorde det möjligt att hantera mätfel separat från den teoretiska konstruktionen (Brown, 2015).

Den analytiska strategin byggde på strukturell ekvationsmodellering, SEM. Detta ramverk gjorde det möjligt att modellera akademisk självuppfattning som en latent variabel och samtidigt analysera relationer mellan latent och observerade variabler (Byrne, 2012). Konfirmatorisk faktoranalys, CFA, användes för att konstruera mätmodeller och undersöka om indikatorerna fångade de teoretiskt avsedda begreppen (Brown, 2015). I Studie I och II testades mätinvarians för att undersöka om självuppfattningsmått var jämförbara över tid respektive mellan kohorter.

I Studie I användes latent tillväxtkurveanalys (*latent growth curve analysis*) för att analysera förändring i självuppfattning från årskurs 6 till 12 (Little, 2024). Utvecklingen modellerades styckvis och delades upp i två perioder: årskurs 6–9 och årskurs 9–12. I Studie II användes strukturell ekvationsmodellering (SEM) på flera nivåer (*multilevel structural equation modelling*, MSEM), för att samtidigt analysera relationer på individ- och skolnivå, vilket är centralt i BFLPE. Modellen skilde mellan individuell och skolgenomsnittlig prestation och testade om den kontextuella relationen varierade med kognitiv förmåga (Marsh et al., 2009). I Studie III användes SEM för att undersöka associationen mellan generell akademisk självuppfattning i årskurs 6 och registrerad inkomst i vuxen ålder, med centrala skol- och bakgrundsvariabler som kovariater.

Reliabilitet och validitet beaktades genomgående. De latent skalornas interna konsistens undersöktes, och mätmodellerna byggde på teori och prövades med CFA (Kline, 2015). De stora och representativa urvalen, de latent modellerna och modellutvärderingen stärkte studiernas kvalitet. Samtidigt är alla tre studier observationella till sin karaktär, vilket innebär att inga kausala slutsatser kan dras (Shadish et al., 2002). Olika operationaliseringar av självuppfattning begränsar också direkta jämförelser mellan studierna. Studierna byggde på redan insamlade enkät-, test- och registerdata. Data hanterades så att deltagarnas konfidentialitet skyddades, och resultaten redovisades på gruppnivå (Swedish Research Council, 2024).

Resultat och diskussion

Studie I visade stöd för det förväntade I/E-mönstret. Prestation i matematik var positivt relaterad till självuppfattning i matematik, och prestation i engelska var positivt relaterad till självuppfattning i engelska. Samtidigt var prestation i matematik negativt relaterad till självuppfattning i engelska, och prestation i engelska negativt relaterad till självuppfattning i matematik. Korrelationen mellan självuppfattning i matematik och engelska var också betydligt svagare än korrelationen mellan prestationerna i de två ämnena. Detta visar att elever kan presterar väl i flera ämnen men ändå ha olika uppfattningar om sin förmåga i respektive ämne.

Resultaten kan förstås genom interna och externa jämförelser. Den positiva relationen inom samma ämne kan förklaras av att elever använder erfarenheter, betyg, provresultat och jämförelser med andra elever när de bedömer sin förmåga. Den negativa relationen mellan ämnen kan förklaras av att elever jämför sina prestationer i olika ämnen med varandra. Studie I visade också att dessa jämförelseprocesser var relaterade till utvecklingen av självuppfattning i matematik mellan årskurs 9 och 12, men inte lika tydligt till utvecklingen av självuppfattning i engelska. Det tyder på att jämförelseprocessernas betydelse för utveckling är ämnesspecifika.

Studie II visade statistiskt signifikanta BFLPE i både matematik och svenska. Elever med samma nivå av individuell prestation hade olika självuppfattningar beroende på skolans genomsnittliga prestationsnivå. Elever i skolor med högre genomsnittlig prestation hade lägre självuppfattning i ämnet än lika högpresterande elever i skolor med lägre genomsnittlig prestation. Detta visar att sociala jämförelser är relevanta för akademisk självuppfattning också i en svensk kontext, där det inte existerar formell nivågruppering i grundskolan.

Studie II gav dessutom delvis stöd för bright-student-hypotesen. Kognitiv förmåga modererade BFLPE i matematik, men inte i svenska. I matematik var den negativa relationen mellan skolgenomsnittlig prestation och individuell självuppfattning svagare för elever med högre kognitiv förmåga. Resultatet tyder på att kognitiv förmåga kan fungera som en buffert mot negativa sociala jämförelser i matematik, men att detta inte kan generaliseras direkt till alla ämnen.

Studie I visade att självuppfattning i matematik och engelska utvecklades på olika sätt under ungdomsåren. I årskurs 6 rapporterade eleverna något lägre självuppfattning i matematik än i engelska. Självuppfattning i matematik minskade från årskurs 6 till årskurs 9 och var därefter relativt stabil fram till årskurs 12.

Självuppfattning i engelska ökade däremot tydligt från årskurs 6 till årskurs 9 och minskade sedan något till årskurs 12. Resultaten är delvis i linje med tidigare forskning om sjunkande självuppfattning under ungdomsåren, men visar samtidigt att utvecklingen skiljer sig mellan ämnen.

Utvecklingsbanorna varierade också mellan elever. Kognitiv förmåga var positivt relaterad till initial självuppfattning i matematik, och negativt relaterad till utvecklingen mellan årskurs 9 och 12, men var inte relaterad till självuppfattning i engelska. Flickor rapporterade lägre självuppfattning än pojkar i både matematik och engelska, och dessa skillnader var stabila över tid när prestation, kognitiv förmåga och föräldrars utbildningsnivå beaktades. Föräldrars utbildningsnivå var främst relaterad till utvecklingen av självuppfattning i engelska mellan årskurs 6 och 9 och svagt relaterad till utvecklingen av självuppfattning i matematik under samma period. Sammantaget visar resultaten att elever med liknande prestationer kan utveckla olika självuppfattningar, och att självuppfattning i matematik framstår som särskilt känslig för prestation, kognitiv förmåga och kön.

Studie III visade att generell akademisk självuppfattning i årskurs 6 var positivt associerad med registrerad inkomst vid 35 års ålder. Samma positiva association identifierades för inkomst vid 40 och 45 års ålder. I modellerna beaktades betyg, spårtillhörighet, kognitiv förmåga, kön och föräldrars utbildningsnivå. Resultaten tyder på att elever med högre generell akademisk självuppfattning i årskurs 6 tenderade att ha högre registrerad inkomst i vuxen ålder, även efter justering för centrala skol- och bakgrundsfaktorer.

Sambandet bör dock tolkas försiktigt. Studie III har en observationell design och ger inte underlag för kausala slutsatser. Relationen mellan akademisk självuppfattning och vuxeninkomst är sannolikt indirekt och kan gå genom utbildningsnivå, motivation, ansträngning, utbildningsval och yrkesvägar (Guay et al., 2004; Hansen et al., 2023). Eftersom Studie III inte inkluderade ämnesspecifika självuppfattningar eller senare utbildnings- och yrkesvägar går det inte att identifiera vilka mekanismer som kan länka tidig självuppfattning till inkomst. Inkomst är dessutom ett begränsat mått på vuxna utfall eftersom det inte fångar yrke, yrkestillfredsställelse, livstillfredsställelse eller välbefinnande. Trots detta visar resultaten att generell akademisk självuppfattning kan vara relevant även bortom utbildningssystemet.

Avslutande slutsatser

Sammantaget visar avhandlingen att akademisk självuppfattning är relaterad till interna, externa och sociala jämförelseprocesser, och att dess utveckling är relaterad till individuella egenskaper. Jämfört med självuppfattning i engelska och svenska framstår självuppfattning i matematik som särskilt känslig för prestations- och jämförelseprocesser, kognitiv förmåga och kön. Ämnesspecificiteten var också tydlig i utvecklingen över tid. Självuppfattning i matematik och engelska utvecklades på olika sätt under ungdomsåren, och deras utvecklingsbanor var relaterade till prestation, kognitiv förmåga, kön och föräldrars utbildningsnivå på olika sätt. Slutligen var generell akademisk självuppfattning positivt associerad med inkomst i vuxen ålder. Resultaten ska inte tolkas kausalt, men de visar att elevers uppfattningar om sin akademiska kompetens är relevanta för att förstå både skolrelaterade processer och senare livsvägar.

Bibliography

- Albert, S. (1977). Temporal comparison theory. *Psychological Review*, 84(6), 485–503. (1978-24266-001). <https://doi.org/https://doi.org/10.1037/0033-295X.84.6.485>
- Arens, A. K., & Jansen, M. (2016). Self-concepts in reading, writing, listening, and speaking: A multidimensional and hierarchical structure and its generalizability across native and foreign languages. *Journal of Educational Psychology*, 108(5), 646–664. <https://doi.org/https://doi.org/10.1037/edu0000081>
- Arens, A. K., Marsh, H. W., Pekrun, R., Lichtenfeld, S., Murayama, K., & vom Hofe, R. (2017). Math Self-Concept, Grades, and Achievement Test Scores: Long-Term Reciprocal Effects Across Five Waves and Three Achievement Tracks. *Journal of Educational Psychology*, 109(5), 621–634. <https://doi.org/https://doi.org/10.1037/edu0000163>
- Arens, A. K., & Niepel, C. (2023). Formation of academic self-concept and intrinsic value within and across three domains: Extending the reciprocal internal/external frame of reference model. *British Journal of Educational Psychology*, 93(2), 545–570. Education Research Complete (163604729). <https://doi.org/https://doi-org.ezproxy.ub.gu.se/10.1111/bjep.12578>
- Arens, A. K., Yeung, A. S., Craven, R. G., & Hasselhorn, M. (2011). The twofold multidimensionality of academic self-concept: Domain specificity and separation between competence and affect components. *Journal of Educational Psychology*, 103(4), 970–981. <https://doi.org/https://doi.org/10.1037/a0025047>
- Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, N.J.: Prentice-Hall.
- Basarkod, G., Marsh, H. W., Guo, J., Dicke, T., Xu, K., & Parker, P. D. (2023). The Big-Fish-Little-Pond Effect for Reading Self-Beliefs: A Cross-National Exploration with PISA 2018. *Scientific Studies of Reading*, 27(4), 375–392. <https://doi.org/https://doi.org/10.1080/10888438.2023.2174028>
- Betz, N. E., & Hackett, G. (1983). The relationship of mathematics self-efficacy expectations to the selection of science-based college majors. *Journal of Vocational Behavior*, 23(3), 329–345. [https://doi.org/https://doi.org/10.1016/0001-8791\(83\)90046-5](https://doi.org/https://doi.org/10.1016/0001-8791(83)90046-5)
- Böhlmark, A., Holmlund, H., & Lindahl, M. (2016). Parental choice, neighbourhood segregation or cream skimming? An analysis of school segregation after a generalized choice reform. *Journal of Population Economics*, 29(4), 1155–1190.
- Bollen, K. A. (2002). Latent Variables in Psychology and the Social Sciences. *Annual Review of Psychology*, 53(1), 605–634.
- Bong, M., & Clark, R. E. (1999). Comparison between self-concept and self-efficacy in academic motivation research. *Educational Psychologist*, 34(3), 139–154. https://doi.org/https://doi.org/10.1207/s15326985ep3403_1

- Bong, M., & Skaalvik, E. M. (2003). Academic Self-Concept and Self-Efficacy: How Different Are They Really? *Educational Psychology Review*, 15(1), 1–40.
<https://doi.org/http://www.jstor.org/stable/23361533>
- Brown, T. A. (2015). *Confirmatory factor analysis for applied research*. New York: Guilford Press.
- Byrne, B. M. (2012). *Structural equation modeling with Mplus: Basic concepts, applications, and programming*. New York: Routledge.
- Chen, S.-K., Yeh, Y.-C., Hwang, F.-M., & Lin, S. S. J. (2013). The relationship between academic self-concept and achievement: A multicohort–multioccasion study. *Learning and Individual Differences*, 23, 172–178. <https://doi.org/10.1016/j.lindif.2012.07.021>
- Chen, X. (2022). The effects of individual- and class-level achievement on attitudes towards mathematics: An analysis of Hong Kong students using TIMSS 2019. *Studies in Educational Evaluation*, 72(1), 101113. <https://doi.org/https://doi.org/10.1016/j.stueduc.2021.101113>
- Chestnut, E. K., Lei, R. F., Sarah-Jane, L., & Cimpian, A. (2018). The Myth That Only Brilliant People Are Good at Math and Its Implications for Diversity. *Education Sciences*, 8(2), 65. (2108396212). <https://doi.org/https://doi.org/10.3390/educsci8020065>
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating Goodness-of-Fit Indexes for Testing Measurement Invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 9(2), 233–255. https://doi.org/https://doi.org/10.1207/S15328007SEM0902_5
- Chiu, M. (2012). The internal/external frame of reference model, big-fish-little-pond effect, and combined model for mathematics and science. *Journal of Educational Psychology*, 104(1), 87–107.
- Cho, E., & Kim, S. (2015). Cronbach's Coefficient Alpha: Well Known but Poorly Understood. *Organizational Research Methods*, 18(2), 207–230.
<https://doi.org/https://doi.org/10.1177/1094428114555994>
- Choy, M. W., & Yeung, A. S. (2022). Cognitive and affective academic self-concepts: Which predicts vocational education students' career choice? *International Journal of Educational Research Open*, 3, 100123. <https://doi.org/https://doi.org/10.1016/j.ijedro.2022.100123>
- Collins, R. L. (1996). For better or worse: The impact of upward social comparison on self-evaluations. *Psychological Bulletin*, 119(1), 51–69.
<https://doi.org/https://doi.org/10.1037/0033-2909.119.1.51>
- Curran, P. J., Bollen, K. A., Chen, F., Paxton, P., & Kirby, J. B. (2003). Finite Sampling Properties of the Point Estimates and Confidence Intervals of the RMSEA. *Sociological Methods & Research*, 32(2), 208–252.
<https://doi.org/https://doi.org/10.1177/0049124103256130>
- Dicke, T., Marsh, H. W., Parker, P. D., Guo, J., & Televantou, I. (2018). Effects of school-average achievement on individual self-concept and achievement: Unmasking phantom effects masquerading as true compositional effects. *Journal of Educational Psychology*, 110(8), 1112–1126. <https://doi.org/https://doi.org/10.1037/edu0000259>
- Dicke, T., Marsh, H. W., Parker, P. D., Pekrun, R., Guo, J., Basarkod, G., Televantou, I., & Teuber, Z. (2026). Investigating the effects of class average achievement: Attending a high-achieving class is neither beneficial for student achievement nor for academic self-concept. *Contemporary Educational Psychology*, 84, 102441.
<https://doi.org/https://doi.org/10.1016/j.cedpsych.2025.102441>

- Eccles, J. S., & Wigfield, A. (2002). Motivational Beliefs, Values, and Goals. *Annual Review of Psychology*, 53(1), 109–132.
<https://doi.org/https://doi.org/10.1146/annurev.psych.53.100901.135153>
- Elliot, A. J., & Dweck, C. S. (2005). Competence and motivation: Competence as the core of achievement motivation. In A. J. Elliot & C. S. Dweck (Eds), *Handbook of competence and motivation* (pp. 3–12). New York: Guilford Press.
- Fang, J., Huang, X., Zhang, M., Huang, F., Li, Z., & Yuan, Q. (2018). The Big-Fish-Little-Pond Effect on Academic Self-Concept: A Meta-Analysis. *Frontiers in Psychology*, 9(1569), 1–11.
<https://doi.org/https://doi.org/10.3389/fpsyg.2018.01569>
- Festinger, L. (1954). A Theory of Social Comparison Processes. *Human Relations*, 7(2), 117–140.
<https://doi.org/https://doi.org/10.1177/001872675400700202>
- Fjellman, A.-M., Hansen, K. Y., & Beach, D. (2019). School choice and implications for equity: The new political geography of the Swedish upper secondary school market. *Educational Review*, 71(4), 518–539.
- Frenzel, A. C., Pekrun, R., & Goetz, T. (2007). Girls and mathematics—A ‘hopeless’ issue? A control-value approach to gender differences in emotions towards mathematics. *European Journal of Psychology of Education*, 22(4), 497–514.
- Gottfried, A. E. (1990). Academic Intrinsic Motivation in Young Elementary School Children. *Journal of Educational Psychology*, 82(3), 525–538.
- Green, J., Liem, G. A. D., Martin, A. J., Colmar, S., Marsh, H. W., & McInerney, D. (2012). Academic motivation, self-concept, engagement, and performance in high school: Key processes from a longitudinal perspective. *Journal of Adolescence*, 35(5), 1111–1122.
<https://doi.org/https://doi.org/10.1016/j.adolescence.2012.02.016>
- Grundskoleförordning, SFS 1994:1194 Svensk författningssamling (1994).
https://www.riksdagen.se/sv/dokument-och-lagar/dokument/svensk-forfattningssamling/grundskoleforordning-19941194_sfs-1994-1194/
- Guay, F., Larose, S., & Boivin, M. (2004). Academic Self-concept and Educational Attainment Level: A Ten-year Longitudinal Study. *Self and Identity*, 3(1), 53–68.
- Guay, F., Ratelle, C. F., Roy, A., & Litalien, D. (2010). Academic self-concept, autonomous academic motivation, and academic achievement: Mediating and additive effects. *Learning and Individual Differences*, 20(6), 644–653.
<https://doi.org/https://doi.org/10.1016/j.lindif.2010.08.001>
- Guerin, S., & Tatlow-Golden, M. (2018). How Valid Are Measures of Children’s Self-Concept/ Self-Esteem? Factors and Content Validity in Three Widely Used Scales. *Child Indicators Research*, 12, 1–22. <https://doi.org/https://doi.org/10.1007/s12187-018-9576-x>
- Guo, J., Marsh, H. W., Morin, A. J. S., Parker, P. D., & Kaur, G. (2015). Directionality of the Associations of High School Expectancy-Value, Aspirations, and Attainment: A Longitudinal Study. *American Educational Research Journal*, 52(2), 371–402.
<https://doi.org/http://www.jstor.org.ezproxy.ub.gu.se/stable/24546758>
- Guo, J.-P., Yang, L.-Y., Zhang, J., & Gan, Y.-J. (2022). Academic self-concept, perceptions of the learning environment, engagement, and learning outcomes of university students: Relationships and causal ordering. *Higher Education* (00181560), 83(4), 809–828. Education Research Complete. <https://doi.org/https://doi.org/10.1007/s10734-021-00705-8>
- Gustafsson, J.-E. (2009). Strukturella ekvationsmodeller. In G. Djurfeldt & M. Barmark (Eds), *Statistisk verktygslåda 2: Multivariat analys* (pp. 269–321). Studentlitteratur.

- Hansen, K., Henderson, M., & Shure, N. (2023). The role of academic self-concept in post-compulsory achievement, transitions and labour market outcomes. *Cambridge Journal of Education*, 53(3), 293–309. <https://doi.org/https://doi.org/10.1080/0305764X.2022.2097644>
- Hansford, B. C., & Hattie, J. A. (1982). The Relationship between Self and Achievement/Performance Measures. *Review of Educational Research*, 52(1), 123–142. <https://doi.org/https://doi.org/10.2307/1170275>
- Härnqvist, K. (2000). Evaluation through follow-up. A longitudinal program for studying education and career development. In C.-G. Janson (Ed.), *Seven Swedish longitudinal studies in behavioral science* (pp. 76–114). Stockholm: Forskningsrådsnämnden.
- Harrington, D. (2009). *Confirmatory factor analysis*. Oxford: Oxford University Press.
- Heck, R. H., & Thomas, S. L. (2020). *An Introduction to Multilevel Modeling Techniques – MLM and SEM Approaches* (4th edn). New York: Routledge.
- Holm, M. E., Korhonen, J., Laine, A., Björn, P. M., & Hannula, M. S. (2020). Big-fish-little-pond-effect on achievement emotions in relation to mathematics performance and gender. *International Journal of Educational Research*, 104, 1–12. <https://doi.org/https://doi.org/10.1016/j.ijer.2020.101692>
- Horoz, N., Van Atteveldt, N., Groeniger, J. O., Houweling, T. A. J., Van Lenthe, F. J., Vu, T., Koot, H. M., & Buil, J. M. (2025). Household- and school-level parental education and academic self-concept development in elementary school. *Npj Science of Learning*, 10(1), 62. <https://doi.org/https://doi.org/10.1038/s41539-025-00354-x>
- Hox, J. J., Moerbeek, M., & Schoot, R. V. D. (2018). *Multilevel analysis: Techniques and applications* (3rd edn). Taylor & Francis Ltd.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/https://doi.org/10.1080/10705519909540118>
- Hübner, N., Wagner, W., Zitzmann, S., & Nagengast, B. (2023). How Strong Is the Evidence for a Causal Reciprocal Effect? Contrasting Traditional and New Methods to Investigate the Reciprocal Effects Model of self-Concept and Achievement. *Educational Psychology Review*, 35(6), 1–45. <https://doi.org/https://doi.org/10.1007/s10648-023-09724-6>
- Jacobs, J. E., Lanza, S., Osgood, D. W., Eccles, J. S., & Wigfield, A. (2002). Changes in Children's Self-Competence and Values: Gender and Domain Differences across Grades One through Twelve. *Child Development*, 73(2), 509–527. <https://doi.org/http://www.jstor.org/stable/3696372>
- Jiang, S., Simpkins, S. D., & Eccles, J. S. (2020). Individuals' math and science motivation and their subsequent STEM choices and achievement in high school and college: A longitudinal study of gender and college generation status differences. *Developmental Psychology*, 56(11), 2137–2151. (2020-66274-001). <https://doi.org/http://dx.doi.org/10.1037/dev0001110>
- Jónsdóttir, H. H., & Blöndal, K. S. (2024). Being a big fish in a little pond: Student group composition, perceived academic standing, and young people's academic self-concept. *Educational Psychology*, 44(6–7), 669–689. <https://doi.org/https://doi.org/10.1080/01443410.2024.2391529>
- Jöreskog, K. G. (1971). Simultaneous factor analysis in several populations. *Psychometrika*, 36(4), 409–426. <https://doi.org/https://doi.org/10.1007/BF02291366>

- King, R. B., & McInerney, D. M. (2014). Mapping changes in students' English and math self-concepts: A latent growth model study. *Educational Psychology, 34*(5), 581–597. <https://doi.org/https://doi.org/10.1080/01443410.2014.909009>
- Kline, R. B. (2015). *Principles and Practice of Structural Equation Modeling*. New York: The Guilford Press.
- Lazarides, R., Dicke, A.-L., Rubach, C., & Eccles, J. S. (2020). Profiles of motivational beliefs in math: Exploring their development, relations to student-perceived classroom characteristics, and impact on future career aspirations and choices. *Journal of Educational Psychology, 112*(1), 70–92. (2019-30969-001). <https://doi.org/http://dx.doi.org/10.1037/edu0000368>
- Leslie, S.-J., Cimpian, A., Meyer, M., & Freeland, E. (2015). Expectations of brilliance underlie gender distributions across academic disciplines. *Science, 347*(6219), 262–265. <https://doi.org/http://www.jstor.org/stable/24745875>
- Levin, H. M. (2012). Some economic guidelines for design of a charter school district. *Economics of Education Review, 31*(2), 331–343.
- Lindblad, S. (2011). Turn taking in large-scale reforms: Re-modelling welfare state education in Sweden. *Z Erziehungswiss, 14*, 67–81.
- Little, T. D. (2024). *Longitudinal structural equation modeling* (2nd edn). New York: The Guilford Press.
- Lubienski, C. (2005). Public Schools in Marketized Environments: Shifting Incentives and Unintended Consequences of Competition-Based Educational Reforms. *American Journal of Education, 111*(4), 464–486.
- Lüdtke, O., Marsh, H. W., Robitzsch, A., Trautwein, U., Asparouhov, T., & Muthén, B. O. (2008). The multilevel latent covariate model: A new, more reliable approach to group-level effects in contextual studies. *Psychological Methods, 13*(3), 203–229. <https://doi.org/https://doi.org/10.1037/a0012869>
- Lundahl, L., Erixon Arreman, I., Holm, A.-S., & Lundström, U. (2013). Educational marketization the Swedish way. *Education Inquiry, 4*(3), 497–517.
- Mac Iver, D. J., Stipek, D. J., & Daniels, D. H. (1991). Explaining within-semester changes in student effort in junior high school and senior high school courses. *Journal of Educational Psychology, 83*(2), 201–211. (614382125; 1991-28830-001). <https://doi.org/10.1037/0022-0663.83.2.201>
- Marklund, S. (1985). *Skolsverige 1950-1975 D. 4 Differentieringsfrågan*. Stockholm: Liber Utbildningsförlaget.
- Marsh, H. W. (1984). The Application of a Frame of Reference Model to Explain Paradoxical Results. *The Australian Journal of Education, 28*(2), 165–181.
- Marsh, H. W. (1986). Verbal and Math Self-Concepts: An Internal/External Frame of Reference Model. *American Educational Research Journal, 23*(1), 129–149. <https://doi.org/https://doi.org/10.2307/1163048>
- Marsh, H. W. (1990a). Causal ordering of academic self-concept and academic achievement: A multiwave, longitudinal panel analysis. *Journal of Educational Psychology, 82*(4), 646–656. <https://doi.org/https://doi.org/10.1037/0022-0663.82.4.646>

- Marsh, H. W. (1990b). Influences of internal and external frames of reference on the formation of math and English self-concepts. *Journal of Educational Psychology*, 82(1), 107–116. <https://doi.org/https://doi.org/10.1037/0022-0663.82.1.107>
- Marsh, H. W. (1990c). The Structure of Academic Self-Concept: The Marsh/Shavelson Model. *Journal of Educational Psychology*, 82(4), 623–636.
- Marsh, H. W. (2007). *Self-concept theory, measurement and research into practice: The role of self-concept in educational psychology*. Leicester, UK: British Psychological Society.
- Marsh, H. W. (2023). Extending the reciprocal effects model of math self-concept and achievement: Long-term implications for end-of-high-school, age-26 outcomes, and long-term expectations. *Journal of Educational Psychology*, 115(2), 193–211. (2652933229; 2022-55044-001). <https://doi.org/https://doi.org/10.1037/edu0000750>
- Marsh, H. W., Abduljabbar, A. S., Morin, A. J. S., Parker, P., Abdelfattah, F., Nagengast, B., & Abu-Hilal, M. (2015). The big-fish-little-pond effect: Generalizability of social comparison processes over two age cohorts from Western, Asian, and Middle Eastern Islamic countries. *Journal of Educational Psychology*, 107(1), 258–271. <https://doi.org/https://doi.org/10.1037/a0037485>
- Marsh, H. W., Abduljabbar, A. S., Parker, P. D., Morin, A. J. S., Abdelfattah, F., Nagengast, B., Möller, J., & Abu-Hilal, M. M. (2015). The Internal/External Frame of Reference Model of Self-Concept and Achievement Relations: Age-Cohort and Cross-Cultural Differences. *American Educational Research Journal*, 52(1), 168–202. <https://doi.org/https://www.jstor.org/stable/24546725>
- Marsh, H. W., & Ayotte, V. (2003). Do Multiple Dimensions of Self-Concept Become More Differentiated With Age? The Differential Distinctiveness Hypothesis. *Journal of Educational Psychology*, 95(4), 687–706. (2003-09576-002). <https://doi.org/10.1037/0022-0663.95.4.687>
- Marsh, H. W., & Basarkod, G. (2023). Big-Fish-Little-Pond Effect: Universality of Psychological Comparison Processes. In M. Bong, J. Reeve, & S. Kim (Eds), *Motivation Science: Controversies and Insights* (pp. 100–107). Oxford: Oxford University Press. <https://doi.org/https://doi.org/10.1093/oso/9780197662359.003.0017>
- Marsh, H. W., Basarkod, G., Pekrun, R., Dicke, T., Parker, P. D., & Guo, J. (2024). Academic Self-Concept Formation: A Three-Faceted Model of Psychological Comparison Processes. In A. O'Donnell, N. C. Barnes, & J. Reeve (Eds), *The Oxford Handbook of Educational Psychology*. Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199841332.013.37>
- Marsh, H. W., & Craven, R. G. (2006). Reciprocal Effects of Self-Concept and Performance from a Multidimensional Perspective: Beyond Seductive Pleasure and Unidimensional Perspectives. *Perspectives on Psychological Science*, 1(2), 133–163.
- Marsh, H. W., Ellis, L. A., & Craven, R. G. (2002). How do preschool children feel about themselves? Unraveling measurement and multidimensional self-concept structure. *Developmental Psychology*, 38(3), 376–393. (614410129; 2002-12745-004). <https://doi.org/10.1037/0012-1649.38.3.376>
- Marsh, H. W., & Hau, K. T. (2003). Big-fish-little-pond effect on academic self-concept. A cross-cultural (26-country) test of the negative effects of academically selective schools. *American Psychologist*, 58(5), 364–376. <https://doi.org/https://doi.org/10.1037/0003-066X.58.5.364>

- Marsh, H. W., Köller, O., & Baumert, J. (2001). Reunification of East and West German School Systems: Longitudinal Multilevel Modeling Study of the Big-Fish-Little-Pond Effect on Academic Self-Concept. *American Educational Research Journal*, 38(2), 321–350.
- Marsh, H. W., Kong, C., & Hau, K. (2000). Longitudinal multilevel models of the big-fish-little-pond effect on academic self-concept: Counterbalancing contrast and reflected-glory effects in Hong Kong schools. *Journal of Personality and Social Psychology*, 78(2), 337–349. <https://doi.org/https://doi.org/10.1037/0022-3514.78.2.337>
- Marsh, H. W., Kuyper, H., Seaton, M., Parker, P. D., Morin, A. J. S., Möller, J., & Abduljabbar, A. S. (2014). Dimensional comparison theory: An extension of the internal/external frame of reference effect on academic self-concept formation. *Contemporary Educational Psychology*, 39(4), 326–341. <https://doi.org/https://doi.org/10.1016/j.cedpsych.2014.08.003>
- Marsh, H. W., Lüdtke, O., Nagengast, B., Trautwein, U., Abduljabbar, A. S., Abdelfattah, F., & Jansen, M. (2015). Dimensional Comparison Theory: Paradoxical relations between self-beliefs and achievements in multiple domains. *Learning and Instruction*, 35, 16–32. <https://doi.org/10.1016/j.learninstruc.2014.08.005>
- Marsh, H. W., Lüdtke, O., Robitzsch, A., Trautwein, U., Asparouhov, T., Muthén, B., & Nagengast, B. (2009). Doubly-latent models of school contextual effects: Integrating multilevel and structural equation approaches to control measurement and sampling error. *Multivariate Behavioral Research*, 44(6), 764–802. <https://doi.org/https://doi.org/10.1080/00273170903333665>
- Marsh, H. W., & Martin, A. J. (2011). Academic self-concept and academic achievement: Relations and causal ordering. *British Journal of Educational Psychology*, 81(1), 59–77. <https://doi.org/https://doi.org/10.1348/000709910X503501>
- Marsh, H. W., Martin, A. J., Yeung, A. S., & Craven, R. G. (2017). Competence self-perceptions. In A. J. Elliot, C. S. Dweck, & D. S. Yeager (Eds.), *Handbook of competence and motivation: Theory and application* (2nd edn, pp. 85–115). New York, NY: Guilford Press.
- Marsh, H. W., & O'Mara, A. J. (2008). Reciprocal effects between academic self-concept, self-esteem, achievement, and attainment over seven adolescent years: Unidimensional and multidimensional perspectives of self-concept. *Personality and Social Psychology Bulletin*, 34, 542–552. <https://doi.org/https://doi.org/10.1177/0146167207312313>
- Marsh, H. W., & Parker, J. W. (1984). Determinants of Student Self-Concept: Is It Better to Be a Relatively Large Fish in a Small Pond Even if You Don't Learn to Swim as Well? *Journal of Personality and Social Psychology*, 41(1), 213–231. <https://doi.org/https://doi.org/10.1037/0022-3514.47.1.213>
- Marsh, H. W., Pekrun, R., & Lüdtke, O. (2022). Directional Ordering of Self-Concept, School Grades, and Standardized Tests Over Five Years: New Tripartite Models Juxtaposing Within- and Between-Person Perspectives. *Educational Psychology Review*, 34(4), 2697–2744. <https://doi.org/https://doi.org/10.1007/s10648-022-09662-9>
- Marsh, H. W., Pekrun, R., Parker, P. D., Murayama, K., Guo, J., Dicke, T., & Arens, A. K. (2019). The murky distinction between self-concept and self-efficacy: Beware of lurking jingle-jangle fallacies. *Journal of Educational Psychology*, 111(2), 331–353. <https://doi.org/https://doi.org/10.1037/edu0000281>
- Marsh, H. W., Seaton, M., Trautwein, U., Lüdtke, O., Hau, K. T., O'Mara, A. J., & Craven, R. G. (2008). The Big-fish–little-pond-effect Stands Up to Critical Scrutiny: Implications for Theory, Methodology, and Future Research. *Educational Psychology Review*, 20(3), 319–350. <https://doi.org/http://www.jstor.org/stable/23363893>

- Marsh, H. W., & Shavelson, R. (1985). Self-Concept: Its Multifaceted, Hierarchical Structure. *Educational Psychologist*, 20(3), 107–123.
https://doi.org/https://doi.org/10.1207/s15326985ep2003_1
- Marsh, H. W., Trautwein, U., Lüdtke, O., Köller, O., & Baumert, J. (2005). Academic Self-Concept, Interest, Grades, and Standardized Test Scores: Reciprocal Effects Models of Causal Ordering. *Child Development*, 76(2), 397–416.
<https://doi.org/http://www.jstor.org.ezproxy.ub.gu.se/stable/3696511>
- Marsh, H. W., Xu, K. M., Parker, P. D., Kit-Tai, H., Pekrun Reinhard, Elliot, A., Guo Jiesi, Dicke, T., & Basarkod Geetanjali. (2021). Moderation of the Big-Fish-Little-Pond Effect: Juxtaposition of Evolutionary (Darwinian-Economic) and Achievement Motivation Theory Predictions Based on a Delphi Approach. *Educational Psychology Review*, 33(4), 1353–1378.
<https://doi.org/https://doi.org/10.1007/s10648-020-09583-5>
- Marsh, H. W., & Yeung, A. S. (1997a). Causal effects of academic self-concept on academic achievement: Structural equation models of longitudinal data. *Journal of Educational Psychology*, 89(1), 41–54. (614397212; 1997-07777-004). <https://doi.org/10.1037/0022-0663.89.1.41>
- Marsh, H. W., & Yeung, A. S. (1997b). Coursework selection: Relations to academic self-concept and achievement. *American Educational Research Journal*, 34(4), 691–720.
- Marsh, H. W., & Yeung, A. S. (1998). Longitudinal Structural Equation Models of Academic Self-Concept and Achievement: Gender Differences in the Development of Math and English Constructs. *American Educational Research Journal*, 35(4), 705–738.
<https://doi.org/https://doi.org/10.2307/1163464>
- Mellander, E. (2017). On the use of register data in educational science research. *Nordic Journal of Studies in Educational Policy*, 3(1), 106–118.
<https://doi.org/10.1080/20020317.2017.1313680>
- Möller, J., Pohlmann, B., Köller, O., & Marsh, H. W. (2009). A Meta-Analytic Path Analysis of the Internal/External Frame of Reference Model of Academic Achievement and Academic Self-Concept. *Review of Educational Research*, 79(3), 1129–1167.
<https://doi.org/https://www.jstor.org/stable/40469091>
- Möller, J., Retelsdorf, J., Köller, O., & Marsh, H. W. (2011). The Reciprocal Internal/External Frame of Reference Model: An Integration of Models of Relations Between Academic Achievement and Self-Concept. *American Educational Research Journal*, 48(6), 1315–1346.
<https://doi.org/http://www.jstor.org/stable/41306388>
- Möller, J., Streblow, L., Pohlmann, B., & Köller, O. (2006). An extension to the internal/external frame of reference model to two verbal and numerical domains. *European Journal of Psychology of Education*, 21(4), 467–487. JSTOR.
<https://doi.org/http://www.jstor.org.ezproxy.ub.gu.se/stable/23421394>
- Möller, J., Zimmermann, F., & Köller, O. (2014). The reciprocal internal/external frame of reference model using grades and test scores. *British Journal of Educational Psychology*, 84(4), 591–611. Education Research Complete (99368121). <https://doi.org/10.1111/bjep.12047>
- Muthén, B. O., Kaplan, D., & Hollis, M. (1987). On structural equation modeling with data that are not missing completely at random. *Psychometrika*, 52(3), 431–462.
<https://doi.org/https://doi.org/10.1007/BF02294365>
- Muthén, B. O., & Satorra, A. (1995). Complex Sample Data in Structural Equation Modeling. *Sociological Methodology*, 25(1), 267–316. <https://doi.org/https://doi.org/10.2307/271070>

- Muthén, L. K., & Muthén, B. O. (1998). *Mplus User's Guide* (8th edn). Los Angeles, CA: Muthén & Muthén.
- Nagy, G., Trautwein, U., Baumert, J., Köller, O., & Garrett, J. (2006). Gender and course selection in upper secondary education: Effects of academic self-concept and intrinsic value. *Educational Research and Evaluation*, 12(4), 323–345.
<https://doi.org/https://doi.org/10.1080/13803610600765687>
- Nagy, G., Watt, H. M. G., Eccles, J. S., Trautwein, U., Lüdtke, O., & Baumert, J. (2010). The Development of Students' Mathematics Self-Concept in Relation to Gender: Different Countries, Different Trajectories? *Journal of Research on Adolescence*, 20(2), 482–506.
<https://doi.org/https://doi.org/10.1111/j.1532-7795.2010.00644.x>
- National Agency for Education. (2012). *Likvärdig utbildning i svensk grundskola? En kvantitativ analys av likvärdighet över tid*. National Agency for Education.
- National Agency for Education. (2015). *Skolreformer i praktiken—Hur reformerna landade i grundskolans vardag 2011–2014*. National Agency for Education.
- Parker, P. D., Marsh, H. W., Lüdtke, O., & Trautwein, U. (2013). Differential school contextual effects for math and English: Integrating the big-fish-little-pond effect and the internal/external frame of reference. *Learning and Instruction*, 23, 78–89.
<https://doi.org/https://doi.org/10.1016/j.learninstruc.2012.07.001>
- Parker, P. D., Marsh, H. W., Morin, A. J. S., Seaton, M., & Van Zanden, B. (2015). If one goes up the other must come down: Examining ipsative relationships between math and English self-concept trajectories across high school. *British Journal of Educational Psychology*, 85(2), 172–191. <https://doi.org/https://doi.org/10.1111/bjep.12050>
- Plieninger, H., & Dickhäuser, O. (2015). The female fish is more responsive: Gender moderates the BFLPE in the domain of science. *Educational Psychology*, 35(2), 213–227.
<https://doi.org/https://doi.org/10.1080/01443410.2013.814197>
- Putnick, D. L., & Bornstein, M. H. (2016). Measurement Invariance Conventions and Reporting: The State of the Art and Future Directions for Psychological Research. *Developmental Review*, 41, 71–90. <https://doi.org/https://doi.org/10.1016/j.dr.2016.06.004>
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd edn). Thousand Oaks, California: Sage Publications.
- Roy, A., Guay, F., & Valois, P. (2015). The big-fish–little-pond effect on academic self-concept: The moderating role of differentiated instruction and individual achievement. *Learning and Individual Differences*, 42(6), 110–116.
<https://doi.org/https://doi.org/10.1016/j.lindif.2015.07.009>
- Rutkowski, L., & Svetina, D. (2014). Assessing the Hypothesis of Measurement Invariance in the Context of Large-Scale International Surveys. *Educational and Psychological Measurement*, 74(1), 31–57. <https://doi.org/https://doi.org/10.1177/0013164413498257>
- Särndal, C. E. (2007). The calibration approach in survey theory and practice. *Survey Methodology*, 33(2), 99–119.
- Scherrer, V., Hank, P., & Preckel, F. (2023). Development of adolescents' self-esteem and general academic self-concept: Perceived classroom climate makes a difference. *European Journal of Personality*, 37(6), 723–743.
<https://doi.org/https://doi.org/10.1177/08902070221126789>
- Schmidt, I., Brunner, M., & Preckel, F. (2018). Effects of achievement differences for internal/external frame of reference model investigations: A test of robustness of findings

- over diverse student samples. *British Journal of Educational Psychology*, 88(4), 513–528.
<https://doi.org/https://doi.org/10.1111/bjep.12198>
- Seaton, M., Marsh, H. W., & Craven, R. G. (2009). Earning Its Place as a Pan-Human Theory: Universality of the Big-Fish-Little-Pond Effect Across 41 Culturally and Economically Diverse Countries. *Journal of Educational Psychology*, 101(2), 403–419.
<https://doi.org/https://doi.org/10.1037/a0013838>
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Houghton Mifflin.
- Shavelson, R. J., Hubner, J. J., & Stanton, G. C. (1976). Self-concept: Validation of construct interpretations. *Review of Educational Research*, 46, 407–441.
<https://doi.org/https://doi.org/10.2307/1170010>
- Skaalvik, E. M. (1997). Issues in research on self-concept. In M. Machr & P. R. Pintrich (Eds), *Advances in Motivation and Achievement* (Vol. 10, pp. 51–97). JAI Press: New York.
- Skaalvik, E. M., & Rankin, R. J. (1990). Math, Verbal, and General Academic Self-Concept: The Internal/External Frame of Reference Model and Gender Differences in Self-Concept Structure. *Journal of Educational Psychology*, 82(3), 546–554.
- Skaalvik, E. M., & Rankin, R. J. (1995). A test of the Internal/External Frame of Reference Model at different levels of math and verbal self-perception. *American Educational Research Journal*, 32(1), 161–184. <https://doi.org/https://doi.org/10.2307/1163217>
- Swedish Government. (1988). *Om skolans utveckling och styrning* (Prop. 1988/89:4).
https://www.riksdagen.se/sv/dokument-och-lagar/dokument/proposition/om-skolans-utveckling-och-styrning_gc034/html/?utm_source=chatgpt.com
- Swedish National Agency for Education. (n.d.). *Övergång till gymnasieskola, läsåret 2024/25*. Retrieved 28 August 2026, from <https://www.skolverket.se/statistik-och-utvarderingar/statistik-om-forskola-och-skola/sok-statistik-om-forskola-skola-och-vuxenutbildning?sok=SokC&omrade=Betyg+%C3%A5rskurs+9&lasar=2024%2F25&verkform=Grundskola+och+sameskola&run=1>
- Swedish National Agency for Education. (2026, June 26). *Standardiserade tester*.
<https://www.skolverket.se/forandringar-inom-skolomradet/en-skola-i-forandring/standardiserade-tester>
- Swedish Research Council. (2024). *Good Research Practice 2024* (Dnr 5.2-2022-06129).
- Televantou, I., Marsh, H. W., Dicke, T., & Nicolaides, C. (2021). Phantom and big-fish-little-pond-effects on academic self-concept and academic achievement: Evidence from English early primary schools. *Learning and Instruction*, 71(1), 1–10.
<https://doi.org/https://doi.org/10.1016/j.learninstruc.2020.101399>
- Trautwein, U., Lüdtke, O., Marsh, H. W., & Nagy, G. (2009). Within-school social comparison: How students perceive the standing of their class predicts academic self-concept. *Journal of Educational Psychology*, 101(4), 853–866. <https://doi.org/https://doi.org/10.1037/a0016306>
- Valentine, J. C., DuBois, D. L., & Cooper, H. (2004). The Relation Between Self-Beliefs and Academic Achievement: A Meta-Analytic Review. *Educational Psychologist*, 39(2), 111–133.
https://doi.org/https://doi.org/10.1207/s15326985ep3902_3
- Vogl, K., Schmidt, I., & Preckel, F. (2018). The role of academic ability indicators in big-fish-little-pond effect research: A comparison study. *The Journal of Educational Research*, 111(4), 429–438. <https://doi.org/https://doi.org/10.1080/00220671.2017.1291485>

- Wan, S., Lauermaun, F., Bailey, D. H., & Eccles, J. S. (2023). Developmental changes in students' use of dimensional comparisons to form ability self-concepts in math and verbal domains. *Child Development*, 94(1), 272–287. <https://doi.org/10.1111/cdev.13856>
- Wang, L., & Yu, Z. (2023). Gender-moderated effects of academic self-concept on achievement, motivation, performance, and self-efficacy: A systematic review. *Frontiers in Psychology*, 14, 1–15. <https://doi.org/https://doi.org/10.3389/fpsyg.2023.1136141>
- Wang, Z. (2015). Examining big-fish-little-pond-effects across 49 countries: A multilevel latent variable modelling approach. *Educational Psychology*, 35(2), 228–251. <https://doi.org/https://doi.org/10.1080/01443410.2013.827155>
- Wang, Z., & Bergin, David. A. (2017). Perceived relative standing and the big-fish-little-pond effect in 59 countries and regions: Analysis of TIMSS 2011 data. *Learning and Individual Differences*, 57(5), 141–156. <https://doi.org/https://doi.org/10.1016/j.lindif.2017.04.003>
- Wiborg, S. (2015). Privatizing Education: Free School Policy in Sweden and England. *Comparative Education Review*, 59(3), 473–497.
- Wigfield, A., Eccles, J. S., Yoon, K. S., Harold, R. D., Arbreton, A. J. A., Freedman-Doan, C., & Blumenfeld, P. C. (1997). Change in children's competence beliefs and subjective task values across the elementary school years: A 3-year study. *Journal of Educational Psychology*, 89(3), 451–469. (614322845; 1997-05647-006). <https://doi.org/10.1037/0022-0663.89.3.451>
- Wills, T. A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin*, 90(2), 245–271. <https://doi.org/https://doi.org/10.1037/0033-2909.90.2.245>
- Wolff, F., Lüdtke, O., Helm, F., & Möller, J. (2021). Integrating the big-fish-little-pond effect, the basking-in-reflected-glory effect, and the internal/external frame of reference model predicting students' individual and collective academic self-concepts. *Contemporary Educational Psychology*, 65, 1–16. <https://doi.org/https://doi.org/10.1016/j.cedpsych.2021.101952>
- Wolff, F., Petrak, A., Dicke, T., & Möller, J. (2025). Temporal comparison effects on students' academic self-concepts: An investigation of different comparison periods in the 2I/E model with weighted achievement levels. *Journal of Educational Psychology*, 117(2), 273–291. <https://doi.org/https://doi.org/10.1037/edu0000894>
- Wolff, F., Sticca, F., Niepel, C., Götz, T., Van Damme, J., & Möller, J. (2021). The reciprocal 2I/E model: An investigation of mutual relations between achievement and self-concept levels and changes in the math and verbal domain across three countries. *Journal of Educational Psychology*, 113(8), 1529–1549. <https://doi.org/https://doi.org/10.1037/edu0000632>
- Wu, H., Guo, Y., Yang, Y., Zhao, L., & Guo, C. (2021). A Meta-analysis of the Longitudinal Relationship Between Academic Self-Concept and Academic Achievement. *Educational Psychology Review*, 33(4), 1749–1778. Education Research Complete. <https://doi.org/https://doi.org/10.1007/s10648-021-09600-1>
- Yang Hansen, K., & Gustafsson, J.-E. (2016). Causes of educational segregation in Sweden – school choice or residential segregation. *Educational Research and Evaluation*, 22(1–2), 23–44. <https://doi.org/10.1080/13803611.2016.1178589>
- Zander, L., Höhne, E., Harms, S., Pfof, M., & Hornsey, M. J. (2020). When Grades Are High but Self-Efficacy Is Low: Unpacking the Confidence Gap Between Girls and Boys in Mathematics. *Frontiers in Psychology*, 11, 1–14. <https://doi.org/https://doi.org/10.3389/fpsyg.2020.552355>

- Zimmerman, B. J., Bandura, A., & Martinez-Pons, M. (1992). Self-Motivation for Academic Attainment: The Role of Self-Efficacy Beliefs and Personal Goal Setting. *American Educational Research Journal*, 29(3), 663–676.
<https://doi.org/https://doi.org/10.2307/1163261>

Studies I–III

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Klapp, T. (Submitted). Longitudinal Extension of the Internal/External Model: Growth Development of Mathematics and English Self-Concept during Adolescence.

Study II

Klapp, T., Gustafsson, J.-E., & Johansson, S. (2025). Big-Fish-Little-Pond Effects on Ninth-Grade Students' Mathematics and Language Self-Concepts: The Moderating Role of Cognitive Ability. *Journal of Educational Psychology*, 117(2), 257–272.
<https://doi.org/https://doi.org/10.1037/edu0000919>

Study III

Klapp, T., Johansson, S., & Gustafsson, J.-E. (Submitted). Academic Self-Concept and Tracking in Compulsory School: Associations with Income in Adulthood.

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Students' perceptions of their academic abilities matter for their educational pathways. Academic self-concept refers to how students perceive their competence in school and in specific subject domains. These perceptions do not merely reflect previous achievement; they are also formed in relation to comparisons with other students, comparisons across subjects, and the educational contexts in which students are situated.

This thesis investigates how academic self-concept is formed, how it develops during adolescence, and how it is associated with outcomes later in life. Drawing on three empirical studies based on Swedish longitudinal data from the Evaluation Through Follow-up study, the thesis examines mathematics and English self-concept development, social comparisons in relation to school-average achievement, and the association between academic self-concept in compulsory school and income in adulthood.

Taken together, the findings show that academic self-concept is a relational and developmental phenomenon. Students' perceptions of their academic ability are related to multiple comparison processes, develop differently across subject domains, and are associated with long-term outcomes beyond the educational system.



Thea Klapp holds an M.Sc. in Sociology. Her research interests are related to educational psychology, particularly in the areas of academic self-concept, school-related well-being, and motivation.

