



**A Smooth Versus Rocky Path From School to Work:  
Predictors and Consequences of Successful and Unsuccessful  
Transitions From School to Vocational Education and Training  
in Germany**

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## Summary

The transition from school to work constitutes a critical phase in a young person's life and shapes future career prospects and development. Therefore, mastering this transition plays a pivotal role in educational and social inequality. For the most part, previous research has investigated the success of school-to-work transitions simply in terms of attainment in the sense of, for example, obtaining a job with a high socioeconomic status (SES) and high income. However, school-to-work transition is a multidimensional process that requires the consideration of many different indicators of success. The reasons for individual differences in these indicators of transition success are hitherto not completely understood. The aim of the present dissertation was to close this gap in understanding by identifying the predictors and consequences of successful and unsuccessful transitions from school to work in the context of the highly structured German education system. For this purpose, three studies were carried out using samples ( $N = 1,536\text{--}4,137$ ) of young people transitioning from school to vocational education and training (VET) from two representative longitudinal large-scale datasets in Germany: the National Education Panel Study (NEPS) and the German Socio-Economic Panel (SOEP). The common goal of the three studies that form the core of this dissertation was to deepen our understanding of why some young people manage the transition from school to work better than others and to conceptualize reasons for success throughout all phases of the transition process in a comprehensive way.

The first study provides a comprehensive picture of transition success by defining seven success indicators that cover the entire process of transition from school to work via VET and by identifying the role that different background and individual resources and characteristics play in these indicators. Big Five Conscientiousness emerged as the best predictor of transition success above and beyond sociostructural characteristics and cognitive ability. This finding indicates a non-negligible, previously largely underestimated contribution of personality traits to successful transitions from school to work. Other variables were predictive of only some aspects of transition success or were not relevant at all.

Whereas the main focus of the first study was on the objective side of transition success, the second study complemented the view of school-to-work transitions by taking an in-depth look at the subjective side. This subjective side was operationalized as the ability to realize occupational aspirations (i.e., the expected occupation expressed 1 year before school graduation). About half of the sample experienced an aspiration–attainment gap (AAG) to varying degrees after transitioning to VET, in the sense that they attained VET positions with a lower

SES than that of their aspired occupations (underachievement). This result indicates that a negative AAG is a highly prevalent phenomenon among young people in Germany. Higher initial levels of aspirations and lower school grades were the two variables most predictive of a higher risk of an AAG.

The third study further investigated the consequences of an occupational AAG for career development by examining whether and how the ability to realize occupational aspirations affects three domains of subjective well-being during VET. Unexpectedly, not only falling short of occupational aspirations (i.e., underachievement) but also surpassing them (i.e., overachievement) were linked to lower levels of all three domains of well-being compared with those reported by apprentices whose VET positions exactly met their aspirations. In other words, the decisive factor for feelings of success or failure did not seem to be whether the SES of the achieved occupation was objectively regarded as a success or failure, but whether the occupation attained was exactly the occupation that was aspired to.

Taken together, the findings of the three studies in this dissertation expand our knowledge about school-to-work transitions and underline the need for a broader understanding of success in the transition from school to work. Specifically, the results strongly suggest the need for a multidimensional conceptualization of transition success that (a) represents both the objective and subjective sides of this construct with different indicators, including inter alia the AAG; (b) covers the entire transition process—that is, the initial, intermediate, and concluding phases; and (c) captures the consequences of successful and unsuccessful transitions, for example for subjective well-being. In addition, the results indicate the need to consider different groups of sources of individual differences in transition success, including not only sociostructural characteristics and cognitive ability but also malleable characteristics such as personality traits, which have been relatively understudied to date.

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# **1 Introduction**

## 1.1 Theoretical Framework

### 1.1.1 Relevance of Successful School-to-Work Transitions for the Further Life Course

Throughout their lives, individuals are confronted with various (institutional) transitions in the education system and on their subsequent career pathways. These transitions may include, for example, the transition from compulsory schooling to vocational education and training (VET) or from upper secondary to higher education, and the transition to working life, including the first job after completion of education. Early transitions, for example, from secondary school to VET, are particularly crucial in shaping the future occupational careers of young people (e.g., Schoon & Heckhausen, 2019; Tomasik et al., 2009) because they represent some of the most critical steps in a young person's life (e.g., Koen et al., 2012; Schoon & Silbereisen, 2009). Referred to as *school-to-work transitions*, they represent the process leading to entry into full-time employment after completing compulsory school education (Schoon & Silbereisen, 2009).

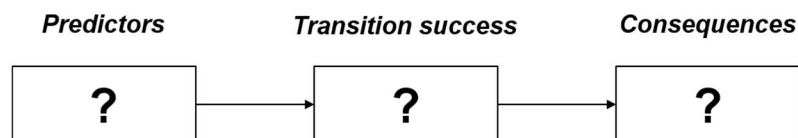
Due to the specific structure of the German education and training system (for more information, see Section 1.1.2), the entire period from school graduation, through VET entry, to VET completion can be described as the transition from school to work and, at the same time, as protected entry into working life. This transition can be either successful or unsuccessful; in other words, it can proceed in a desired and planned or an undesired and unplanned way. On the one hand, it can be smooth and uninterrupted (e.g., if a person enters VET directly after leaving school and successfully completes it) and result in good employment opportunities and a progressive career. On the other hand, it can be marked by setbacks and interruptions (e.g., if a person has to search for a VET position for a long time, does not receive any offers of a VET position, or drops out of vocational training prematurely) in the attempt to gain a foothold in the labor market (e.g., Schoon & Heckhausen, 2019). School-to-work transitions can thus be called a “make or break period” (Schoon, 2021, p. 45)—that is, a period that determines success or nonsuccess.

In this sense, a successful transition “is a precursor of promising career development” (Pinquart et al., 2003, p. 329). By contrast, if the school-to-work transition is unsuccessful, this hampers further career prospects (e.g., Akkermans et al., 2015; Scherer, 2004), affects health and well-being (e.g., Schoon & Bynner, 2017; McKee-Ryan et al., 2005), and, in the long run, can potentially lead to other undesired outcomes at the individual and societal level,

such as unemployment, shortage of skilled workers, social decline, poverty, depression, addictive disorders, and criminal behavior (e.g., Blustein, 2008; Blustein et al., 2000; Koivisto et al., 2010; McKee-Ryan & Harvey, 2011). Hence, school-to-work transitions and their success play an important role in the emergence of educational and social inequality, as they set the course for individuals' further life trajectories (e.g., Klein et al., 2009; Maaz et al., 2006). A major goal of research on school-to-work transitions is to identify the causes of such inequalities and the preconditions of successful transitions. In light of the long-term consequences of school-to-work transitions, it is essential to understand why some people manage such transitions more successfully than others.

But what does “successful transition” actually mean? What helps young people to transition successfully? And what are the consequences of successful and unsuccessful transitions? The present dissertation addresses these questions in the specific context of the transition from school to VET in Germany (see Figure 1.1). Broadly speaking, it is concerned with the predictors and consequences of successful and unsuccessful school-to-work transitions. To this end, three studies were conducted, which form the centerpiece of this dissertation and are presented in Chapters 2–4. As these three chapters are self-contained, they can also be read independently of the rest.

**Figure 1.1:** *Overview of the Topics Dealt With in This Dissertation*



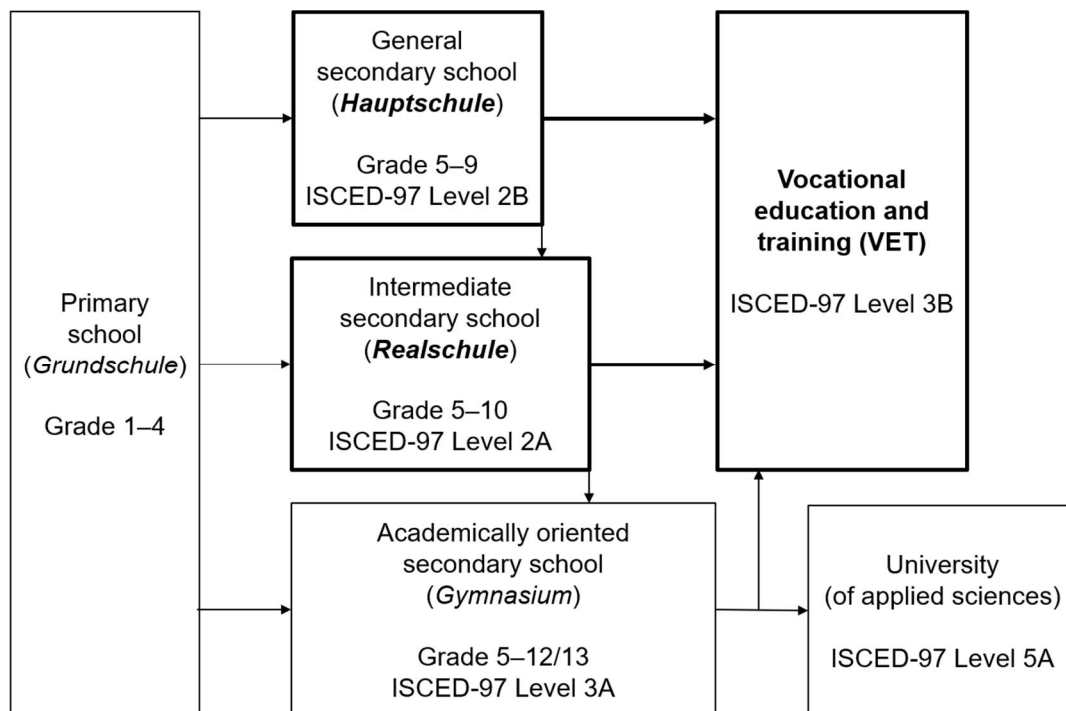
*Note.* The aim of the present dissertation is to fill in the boxes under the individual components and to replace the question marks with content.

The rest of this chapter serves to provide a concise overall framework for the three studies that form the core of the dissertation. It is divided into three parts. The first part provides a description of the German education system (Section 1.1.2) and proposes an integrated theoretical model of transition success that introduces the central constructs (Section 1.1.3). The second part begins by identifying the research gaps and, in parallel, outlining the central aims of this dissertation (Section 1.2.1). This is followed by a description of the two secondary datasets used (Section 1.2.2) and a summary of the three studies (Section 1.2.3). And finally, the third part concludes the chapter with a general discussion of the joint contributions of the three studies to the research field (Section 1.3).

### 1.1.2 The German Education System

The structure of the German education system is very complex and characterized by a high degree of stratification and selection (see Figure 1.2 for a simplified depiction of the system). To better understand the country-specific background of the three studies on which this dissertation is based, the following two sections describe, first, the system of compulsory schooling and, second, the system of subsequent compulsory VET in Germany. As the focus of the dissertation is on the transition to VET, the transition from upper secondary school to higher education is not described in detail.

**Figure 1.2:** *Simplified Overview of the German Education System*



*Note.* ISCED-97 = International Standard Classification of Education 1997. The transition framed in bold is the focus of this dissertation.

#### 1.1.2.1 The General Education School System in Germany

In Germany, compulsory general education typically begins at the age of six with attendance at primary school (*Grundschule*), which comprises four years of schooling in 14 of the 16 federal states (*Bundesländer*) and six years of schooling in the remaining two federal states, (Secretariat of the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany [KMK], 2019a). Depending on students' grades at the end of primary school, teachers make a recommendation for the type of second-

ary school that they should attend. This recommendation is binding only in four federal states; in the remaining 12 federal states, it serves only as a guide for parents (Leibniz Institute for Research and Information in Education [DIPF], 2021).

There are three general types of secondary schools in Germany. The first is the general secondary school (*Hauptschule*), a type of school at lower secondary level that provides a basic general education and typically covers Grades 5 to 9 (KMK, 2019a). Upon graduation, students obtain a school-leaving qualification equivalent to International Standard Classification of Education 1997 (ISCED-97) Level 2B (Schneider, 2008). The second school type is the intermediate secondary school (*Realschule*), a type of school at lower secondary level that typically covers Grades 5 to 10 and offers a more comprehensive general education and the opportunity to go on to upper secondary level (KMK, 2019a). The school-leaving qualification that students attain from this type of school corresponds to ISCED-97 Level 2A (Schneider, 2008). The third type of secondary school is the academically oriented secondary school (*Gymnasium*), a school at lower and upper secondary level that provides in-depth general education (KMK, 2019a). At this type of school, the general higher education entrance qualification (*Allgemeine Hochschulreife*) is acquired by passing the *Abitur* examination (KMK, 2019a), which corresponds to ISCED-97 Level 3A (Schneider, 2008). Depending on the federal state and the year, the general higher education entrance qualification is obtained after Grade 12 (G8) or Grade 13 (G9). Until and including 2005, students could acquire the *Abitur* only after completion of 13th grade; in 2006, the first class acquired the *Abitur* after completing 12th grade; in the course of the following years, the 12-year model was introduced nationwide. In some federal states, G8 is now the only option offered; in others, it is offered in addition to G9.<sup>1</sup>

In the 2016/2017<sup>2</sup> school year, 7% of students transferred to *Hauptschule* after primary school, 17% to *Realschule*, 28% to a school combining *Hauptschule* and *Realschule* (i.e., with the possibility of obtaining either the *Hauptschule* or the *Realschule* school-leaving qualification), and 40% to *Gymnasium* (30% G8, 10% G9; Statistisches Bundesamt [Destatis], 2018). In 2017, of all secondary school leavers, 16% graduated from *Hauptschule*, 48% from *Re-*

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<sup>1</sup> In addition to these regular types of schools, there are special schools (*Förderschulen*), which are attended by students whose development cannot be adequately supported in mainstream schools due to learning, physical, or mental disabilities (KMK, 2019a).

<sup>2</sup> All (school) years mentioned in this section correspond to the most recent statistics available from the German Federal Statistical Office (Statistisches Bundesamt [Destatis]).

*alschule*, 32% from the *Gymnasium*, and 5% left the school system without a qualification (Destatis, 2019).

After completing school education, graduates have access to different occupational career paths. The general higher education entrance qualification (after Grade 12 or 13) qualifies the holder to study at a university or a university of applied sciences (KMK, 2019a). By contrast, the *Hauptschule* leaving certificate (after Grade 9) entitles the holder only to enter VET, whereas the *Realschule* leaving certificate (after Grade 10) entitles the holder either to enter VET or, if certain standards of achievement are met, to transfer to the upper level of the *Gymnasium*. Of all VET entrants in 2019, 78% were *Hauptschule* or *Realschule* graduates (Destatis, 2020), as this is the usual transition in these groups, and 16% had graduated from *Gymnasium*.

### 1.1.2.2 The German VET System

The German VET system is a system of initial vocational training entitling VET graduates to take up qualified work in a specific occupation (KMK, 2019b; Protsch & Solga, 2016). Although characterized by a wide spectrum of different occupations and career paths, two basic forms of VET can be distinguished: *dual vocational training* and *full-time school-based vocational training*. Offering more than 320 different training occupations, dual vocational training is the most frequently chosen form. Approximately half of each year's cohort (KMK, 2019b) and over two thirds of VET entrants (German Office for International Cooperation in Vocational Education and Training [GOVET], 2020) undergo vocational training in the dual system. It is so called because the training takes place at two locations: Trainees spend two thirds of their time during the dual VET program at a company, where they are trained in practical skills and knowledge required for the respective occupation (i.e., on-the-job training at the workplace; KMK, 2019b). The remaining one third of their training takes place at a vocational school (*Berufsschule*), where they acquire occupation-related theoretical competencies and study interdisciplinary subjects that deepen the general education they have acquired at secondary school (KMK, 2019b). Depending on the specific training occupation, dual VET lasts 2–3.5 years (KMK, 2019b).

The most common training occupations are accounted for by three occupational groups: skilled crafts occupations; occupations in the natural sciences and commercial or technical occupations; and business administration occupations (GOVET, 2020). Although, in theory, there are no specific criteria for admission to a particular dual VET program (GOVET, 2020), training enterprises often require certain school-leaving qualifications because the dual VET

system is a very competitive field (Protsch & Soga, 2016). More specifically, there are training occupations with different levels of qualification and different career and salary prospects (Protsch & Soga, 2016), which can be classified as low-skilled (e.g., baker, plumbing and heating installer), skilled (e.g., mechatronics technician, industrial mechanic), or professional (e.g., bank clerk, IT specialist). As a result, school leavers who have no school-leaving qualification or only a *Hauptschule* leaving certificate are often unable to find a VET position and must therefore enroll in a year of pre-vocational training (*Berufsvorbereitungsjahr*; Protsch & Solga, 2016), which prepares them for the requirements of dual training (KMK, 2019b).

The second form of VET is full-time school-based vocational training, which offers around 60 different training occupations and provides 1–3 years of full-time school-based training at a vocational school, a trade and technical school, or a school in the healthcare sector (GOVET, 2020). In some cases—especially in the case of training in specialist health occupations regulated under federal law—these courses also have a high proportion of company-based practical phases (GOVET, 2020, p. 12). In addition to training programs in the healthcare sector, other typical occupational fields for school-based VET are social services, foreign languages, engineering and IT (GOVET, 2020). Normally, school-based VET can be accessed only by applicants with at least a *Realschule* leaving certificate (Protsch & Solga, 2016).

### 1.1.3 Theoretical Perspectives on School-to-Work Transitions

A plethora of research on the transition from school to work has been conducted in a variety of disciplines, mostly in the social sciences. This research adopts different approaches to the topic, ranging from theoretical perspectives on, for example, career decision-making (e.g., Krumboltz, 1979), career construction (e.g., Savickas, 2013), career development (e.g., Lent, 2013), and person–environment fit (e.g., Swanson & Schneider, 2013), to studies describing or statistically analyzing transitions and their consequences in an empirical setting (e.g., McVicar & Anyadike-Danes, 2002; Piquart et al., 2003; Quintini & Manfredi, 2009). A number of studies have also been conducted on interventions to facilitate transition: For example, specific training programs have been proposed aimed at providing graduates with career adaptability resources to improve their chances of finding a qualitatively better job (e.g., Koen et al, 2012; van der Horst et al., 2021). What all this research has in common is that it attempts to determine, understand, and/or explain differences in transition success across individuals, countries, educational systems, etc., and/or to propose concrete ways of compensating for disadvantages, for example in social background and cognitive ability.

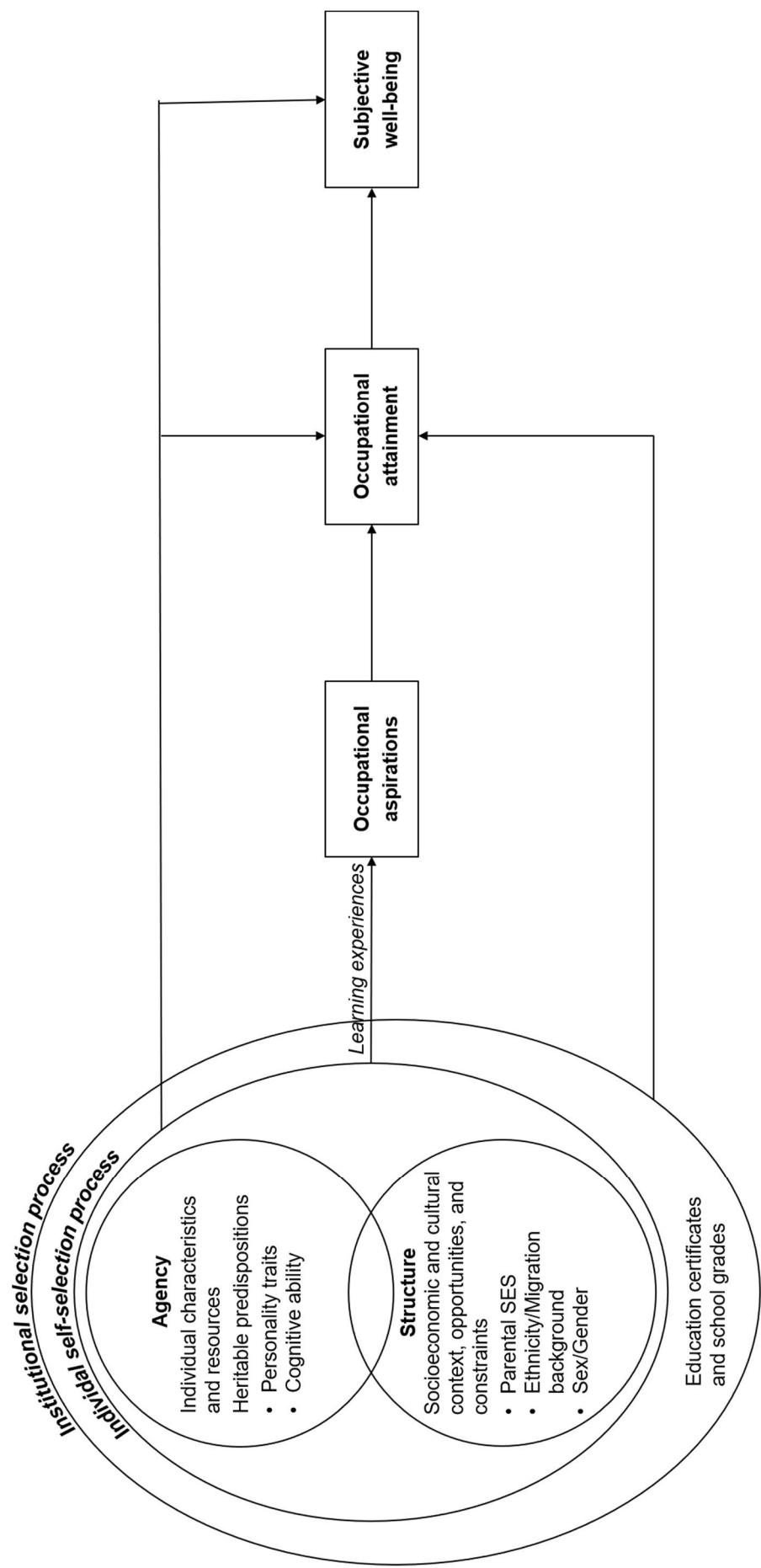
The overarching goal of school-to-work transition research is, first, to understand how different transition pathways emerge and, second, to help create a system that enables adolescents to find and take on “productive and rewarding roles in the workplace” (Rogers & Creed, 2000, p. 2). To be able to counteract future long-term problems with targeted interventions and support such as personal advising and mentoring, it is therefore necessary to identify at an early stage which young people have, for example, a higher probability of becoming unemployed when they enter the labor market (e.g., McVicar & Anyadike-Danes, 2002). However, before targeted interventions and support can be offered, certain issues need to be addressed, such as the identification of predictors and consequences of successful and unsuccessful transitions. In this way, assistance can be targeted especially to those adolescents who are likely to have greater difficulty in making the transition successfully. For this purpose, background variables and individual characteristics must be identified that influence success in transitions.

As there is no specific (psychological) theoretical model for school-to-work transitions, it is necessary to combine existing theories from different research fields to obtain a comprehensive picture of the sources of and reasons for individual differences in transition success. Based on an interdisciplinary theoretical approach that draws on psychological, sociological, and economic theories, this section presents a synthesis of such an integrated theoretical model that contributes to the understanding of the transition from school to work (illustrated in Figure 1.3). School-to-work transitions—and their success—are multifaceted and depend on various different factors, namely, individual choices, social and ethnic background, individual characteristics and resources, as well as regional opportunity structures and constraints in a country (Schoon & Silbereisen, 2009). In principle, there are two pathways via which the different determinants can influence success in the transition from school to work.

The first pathway in the school-to-work transition is the *individual self-selection process*. It reflects individuals’ resources and behaviors and comprises two interconnected components: *agency* and *structure*. Agency, the first and bottom level of the school-to-work transition, is formed from individual characteristics and resources—that is, heritable predispositions, such as personality traits and cognitive ability. Structure, the second level of the school-to-work transition, includes socioeconomic and cultural context, opportunities, and constraints such as family and social background (e.g., parental socioeconomic status, ethnicity/migration background, and sex/gender).



**Figure 1.3:** *Integrated Theoretical Model of Sources of Individual Differences in the Transition From School to Work*



*Note.* SES = socioeconomic status.

These two components directly and reciprocally affect the success of the transition from school to work by fostering the choice and pursuit of occupational goals. According to *social cognitive career theory* (SCCT; Lent et al., 2002), individuals' predispositions, background characteristics, and contextual factors (e.g., opportunities for competence development, financial support) successively exert an influence on learning experiences, occupational aspirations, and ultimately occupational attainment. As a mediator between agency characteristics and occupational attainment and between structural characteristics and occupational attainment, occupational aspirations play a special role in the transition from school to work.

Occupational aspirations (also called orientations) represent the concrete occupations that individuals wish for (i.e., idealistic aspirations) or expect (i.e., realistic aspirations) in later working life. According to the *theory of circumscription, compromise and self-creation* (CCS; Gottfredson, 2002), individuals develop a "zone of acceptable alternatives" (p. 91) during childhood and adolescence (circumscription). As the decision for a VET position (or higher education) draws closer, they adapt their zone of acceptable alternatives to their perceived opportunity structures (compromise), including their individual resources and external constraints (Rehberg, 1967). Such perceived opportunity structures constitute the "horizon of perceived possibilities" (Schoon & Heckhausen, 2019, p. 140) and vary by learning experiences, interests, individual characteristics and resources, as well as family and social background (i.e., by agency and structure). In the end, the occupation that offers the best person–environment fit is preferred and aspired to (self-creation).

An important aspect of the transition from school to work thus concerns the ability—or inability—to realize aspirations and its consequences at the individual level. According to *level of aspiration theory* (Starbuck, 1963), individuals perceive discrepancies (gaps) between aspirations and later attainment as failure and realized aspirations as success. In accordance with this, *multiple discrepancies theory* (Michalos, 1985) and *self-discrepancy theory* (Higgins, 1987) state that such so-called *aspiration–attainment gaps* have an influence on individuals' subjective well-being and go hand in hand with feelings of dissatisfaction and disappointment—a hindrance to career development.

The second pathway in the school-to-work transition reflects the external perception of individuals and their behavior and is the *institutional selection process*, which is the third level in the school-to-work transition. This pathway (and simultaneously third level) avails of the first two levels of school-to-work transition, agency and structure, and includes dependence on the education system, on hiring decisions, etc. for occupational attainment (and VET positions attained).

There are several economic theories that allow an understanding of the allocation of young people in the labor market. Although originally developed for post-education and post-training working life, these theories are also applicable to VET positions. They emphasize the second pathway in the school-to-work transition: “Instead of people looking for jobs, there are jobs looking for people—for ‘suitable’ people” (Thurow, 1972, p. 68) because there is high competition for the VET positions available on the training market. In this context, *signaling theory* (Spence, 1973) ascribes a very special role to education certificates (including school grades) in helping employers distinguish between productive and unproductive applicants. According to *job competition theory* (Thurow, 1979), VET positions are offered to applicants in a certain rank order depending on their visible and perceived background characteristics, including their individual and sociostructural resources (i.e., agency and structure). In other words, employers’ perception of individuals and their behavior acts as a selection tool by providing information about the expected suitability of applicants.

This integrated theoretical model suggests that the transition from school to work is a complex process, with many factors playing a role in its success. To get to the bottom of such individual differences and reveal reasons for individual differences in transition success in the German context, three studies were conducted as part of this dissertation; they are summarized in Section 1.2.3 and presented in detail in Chapters 2–4.

## 1.2 The Present Dissertation

The following section (1.2.1) describes the aims and research questions of this dissertation. Section 1.2.2 presents the datasets used in the three studies that form the core of this dissertation. And finally, Section 1.2.3 provides a summary of these three studies.

### 1.2.1 Aims and Research Questions

Previous studies on school-to-work transitions hail for the most part from English-speaking countries such as the UK and USA (for an exception, see, e.g., Diedrich et al., 2018). Because education systems vary widely across countries, the results of these studies cannot be generalized to the specific transition from school to work via VET in Germany. Given that the German VET system trains apprentices in very specific occupations, individuals who successfully complete VET tend to stay in the occupation for which they were trained (KMK, 2019b; Protsch & Solga, 2016). Because VET is thus accompanied by long-term effects and determines career options in the further life course, the present dissertation aimed to shed further

light on predictors and consequences of successful and unsuccessful transitions from school to VET in the context of the highly structured German education system. This is important to better understand the shaping of future occupational careers and to reduce social inequality through targeted interventions.

Typical measurements of transition success have generally focused on objective outcomes related to employment (Hannan et al., 1996), such as occupational attainment (e.g., Schoon & Polek, 2011), occupational socioeconomic status (SES; e.g., Blossfeld, 2017), income/income growth (e.g., Ou et al., 2007), unemployment (e.g., Caspi et al., 1998), or labor force participation (e.g., Flouri & Buchanan, 2002). However, for the most part, these measures can be thought of as purely economically oriented indicators of career success—in the sense of getting a highly prestigious job (Hannan et al., 1996)—rather than successful school-to-work transition. Account has rarely been taken of other issues linked more to the smoothness of transition phase in that critical early stage of a future career—for example, finding a VET position directly after graduation or not dropping out of VET. In addition, along with the aforementioned objective indicators, success always has an individual and subjective side. For that reason, other outcomes, such as obtaining a VET position in the first place, dropping out of VET, job/VET satisfaction, and job fit (in terms of getting what one wanted) are also important factors in gaining a comprehensive understanding of the entire complex process of school-to-work transitions.

Because previous research has examined only isolated indicators of success related mainly to educational or occupational attainment, a comprehensive depiction of transition success is still pending. Hence, school-to-work transition is not yet well understood, because it is not known what really explains individual differences in different aspects of transition success in today's demanding and fast-moving age. This research gap led me to the first two research questions and the first two aims of this dissertation:

*Research Question 1:* What constitutes a successful transition from school to work?

Specifically, I sought to establish a comprehensive *definition* of transition success. This aim was addressed mainly in Study 1 by identifying important indicators of success throughout the entire transition process. Study 2 added another aspect to the broad definition of transition success by focusing on the subjective side of transition success—namely, the extent to which prior occupational aspirations could be realized (i.e., the [absence of an] occupational aspiration–attainment gap), an essential component of transition success as emphasized in

Section 1.1.3. This broad theoretical definition led me directly to the next research question and the empirical exploration of the reasons for and sources of individual differences in these different indicators of transition success:

*Research Question 2:* What are the determinants of successful transition from school to work?

Specifically, I sought to identify the *predictors* of transition success. This aim was addressed in Studies 1 and 2 by demonstrating the relevance of various individual resources and background characteristics—introduced in the integrative theoretical model of school-to-work transitions in Section 1.1.3—for various indicators of transition success. This revealed whether a particular determinant was predictive of transition success per se or only of specific objective and subjective indicators—both incrementally above and beyond, and relative to, the other determinants.

Next, in addition to the comprehensive depiction and the identification of predictors of transition success, another key issue concerns the relevance of successful and unsuccessful transitions (i.e., in the sense of success or nonsuccess) for subjective well-being, as postulated in the theoretical model in Section 1.1.3. Previous studies have shown that subjective well-being is predictive of a range of progress-related outcomes, such as work motivation (e.g., Ton & Hansen, 2001), goal engagement (e.g., Luhman & Hennecke, 2017), goal striving (e.g., Haase et al., 2012), and undesired job change (e.g., Giver et al., 2010). It is crucial to examine how the subjective side of transition success (i.e., the ability to realize own occupational aspirations) affects individuals' well-being. This is of particular relevance during the critical transition phase from school to work because the interacting factors well-being, motivation, goal pursuit, and achievement (Heckhausen & Kay, 2018) can either support or impede career development.

However, there is only sparse evidence in the literature on the role of the aspiration–attainment gap for subjective well-being (e.g., Carr, 1997; Hardie, 2014). The findings of these studies, particularly with regard to the effect on well-being of overachieving occupational aspirations, were inconclusive. Hardie (2014) found a positive effect of overachievement on well-being in one U.S. sample and a negative effect in another, whereas Carr (1997) found no effect. Moreover, rather than examining the effect of under- and overachievement on subjective well-being longitudinally, these studies measured the effect only cross-sectionally at one point in time. To fill this gap, I aimed to answer the following research question:

*Research Question 3: What consequences do successful and unsuccessful transitions from school to work have for further career development?*

More precisely, I sought to uncover the impact of successful and unsuccessful transitions on subjective well-being over time. This aim was pursued in Study 3 by analyzing the impact of falling short of or surpassing occupational aspirations on the level and development over time of different domains of subjective well-being during VET.

### **1.2.2 Data Basis**

To empirically investigate the above research questions, I used secondary data from two comprehensive and longitudinal large-scale surveys representative of the German population conducted (bi)annually: first, for Studies 1 and 2, Starting Cohort 4 of the German National Educational Panel Study (NEPS; Blossfeld & Roßbach, 2011; Versions 9.1.0 and 9.1.1); second, for Study 3, the German Socio-Economic Panel (SOEP; Goebel et al., 2019; Version 35). Both surveys track participants educational, vocational, and occupational biographies (including transitions and career paths) over time.

#### **1.2.2.1 National Educational Panel Study (NEPS)**

NEPS is an ongoing study with a total of six (birth) cohorts covering the entire lifespan (i.e., newborns, kindergarten children, fifth graders, ninth graders, higher-education students, and adults) launched in 2010 (for five of the cohorts) and in 2007 (in the case of the adult cohort). I used Starting Cohort 4 (SC4), the most appropriate cohort for studying the transition from school to work through VET. SC4 comprises 15,110 representatively selected students from 540 regular schools who were in ninth grade during the first wave of the survey in fall/winter 2010/2011. In subsequent (bi)annually conducted waves, students are followed up both within their educational trajectory and after they leave the general school system. In addition to the educational process, data are collected on a variety of topics, including competencies, family background, personality traits, and leisure activities. At the time the first two studies of the dissertation were carried out, data were available up to Wave 9 (i.e., fall 2015/spring 2016).

#### **1.2.2.2 German Socio-Economic Panel (SOEP)**

SOEP was established in 1984 and comprises all age cohorts together in one sample, which is surveyed annually. Since its inception, a total of more than 40,000 private households with around 77,000 participants aged 16/17 and older have taken part in the panel. SOEP provides

data on a broad range of topics by capturing, among other things, sociodemographic variables, life events, educational and occupational trajectories, satisfaction, and psychological constructs. Over the years, the measurement instruments have been extended; all information of relevance to this dissertation has been collected since 2006. When the third study of the dissertation was conducted, the most recent survey year available was 2018.

### **1.2.3 Summary of the Three Studies**

The following sections give an overview and brief summary of the three longitudinal studies that form the core of this dissertation. Detailed information about theories, objectives, hypotheses, methods, and findings can be found in Chapters 2–4.

#### **1.2.3.1 Study 1: Definition and Predictors of Successful School-to-Work Transitions**

Study 1 (Nießen et al., 2020) addressed the first two research questions of this dissertation—namely, what *constitutes* successful transition from school to VET, and what are the *predictors* of successful transition from school to VET. The focus of that study was on personality traits—specifically, first, the incremental contribution of personality traits above and beyond already established predictors of transition success (i.e., sociostructural characteristics and cognitive ability); second, the relative explanatory power of personality traits compared with these other predictors. Previous studies have for the most part neglected to take into account individual resources such as personality traits, which are malleable compared with characteristics such as social class, sex, and ethnicity. As psychosocial and self-regulatory resources, personality traits are likely to influence transition success either directly through individuals' behavior or indirectly through employers' perceptions (as outlined in the integrative theoretical model in Section 1.1.3).

There is no clear consensus on how to define transition success, and previous studies have examined only a limited number of global indicators of success, such as grades, test scores, or highest educational attainment. However, other issues of school-to-work-transitions, such as obtaining a VET position in the first place or dropping out of VET, are also relevant factors of transition success, yet they have largely been neglected in research to date. Furthermore, rather than focusing on a single indicator of success, it is important to focus on several indicators in parallel with the same sample in order to examine whether each determinant (i.e., independent variable) predicts each indicator of success (i.e., dependent variable) equally well or to different degrees. Therefore, we sought, first, to establish a definition of transition success and, second, to analyze transition success in a comprehensive man-

ner by identifying the specific contribution of personality traits on transition success above and beyond well-known variables that have previously been considered standard predictors of inequality in transition success.

To this end, we operationalized seven indicators of success in the transition from school to VET based on three criteria: the indicators should, first, be positively valued by individuals and society; second, they should capture a normative understanding of success from a long-term perspective by having consequences for the further life course and further life chances; and, third, they should be linked to a critical phase in the specific transition process (initial entry phase, intermediate orientation phase, final completion phase). In accordance with this definition, we selected the following indicators of school-to-work transition success: (a) obtaining a VET position within the first year after graduation (given a submission of an application); (b) number of offers of VET positions (given a submission of an application); (c) starting a VET position (given an offer of a VET position); (d) absence of dropout intentions during VET; (e) absence of actual dropout; (f) satisfaction with VET after 1 year in a VET position; and (g) final VET grade.

To address the second aim of Study 1—to identify predictors of transition success—we investigated (a) the effects of already established variables that have been found in prior research to be predictors of successful transitions, namely, sociostructural characteristics (i.e., parental SES, migration background, sex) and cognitive ability. In parallel, we investigated (b) the effects of rather understudied variables—namely, the Big Five personality traits—on our seven success indicators of transition success. When doing so, we analyzed both main effects of the predictor variables and interaction effects between the Big Five and parental SES as well as between the Big Five and cognitive ability. For this purpose, we used a sample of 4,137 school leavers from general secondary and intermediate secondary schools (*Hauptschule* and *Realschule*) in Germany from SC4 of NEPS who applied for a VET position within the first year after graduation. All predictor variables were measured when the students were in ninth grade—that is, before the measurement of the transition success indicators.

Results from regression models revealed that Conscientiousness was the most robust and relevant predictor of six of the seven success indicators (i.e., all except dropout intentions), incrementally over and above sociostructural characteristics and cognitive ability. Thus, individuals with higher scores on Conscientiousness tended to have a higher likelihood of successfully making the transition from school to VET. More specifically, there was a positive association between higher Conscientiousness and obtaining and starting a VET position,



a higher number of offers of VET positions, the absence of VET dropouts, higher satisfaction with VET, and a higher final VET grade. Extraversion was positively linked to obtaining a VET position and to the final VET grade; lower Agreeableness was linked to a higher likelihood of not dropping out of VET. However, these associations were weaker than in the case of Conscientiousness. The other Big Five traits showed no effect on any of the success indicators.

Among the sociostructural characteristics, migration background and sex were related to four transition success indicators. However, the effects of sex were in most cases smaller than those of Big Five Conscientiousness, Extraversion, and Agreeableness, and the effects of migration background were in half of the cases smaller than those of the aforementioned Big Five traits. Not having a migration background was associated with a higher likelihood of obtaining and starting a VET position as well as the absence of dropout intentions and actual dropout. Males were more likely than females to obtain a VET position and a higher number of offers. Moreover, they reported fewer dropout intentions and higher satisfaction with VET. Parental SES was associated only with starting a VET position—individuals with higher parental SES were more likely to start a VET position—but this effect was smaller than that of Conscientiousness. Higher cognitive ability predicted four transition success indicators, namely, a higher tendency to obtain and start a VET position, a higher final VET grade, and a lower risk of dropping out of VET. These effects were mostly smaller than those of the three Big Five traits Conscientiousness, Extraversion, and Agreeableness. The relative ranking of all effect sizes on the different success indicators can be found in Figure 1.4 in Section 1.3.1.1.

Regarding the interaction effects, two patterns emerged several times in various transition success indicators: first, a significant interaction between Openness and parental SES (in predicting, e.g., actual dropout); second, a significant interaction between Agreeableness and cognitive ability (in predicting, e.g., obtaining a VET position). These interaction effects were mostly compensatory in nature, meaning that higher scores in Openness and Agreeableness compensated for disadvantages in parental SES and cognitive ability.

In sum, Study 1 contributes to the literature on school-to-work transitions, first, by providing a nuanced picture of transition success and capturing a broad range of carefully selected indicators depicting all phases in the transition process. Second, it demonstrates the non-negligible role of Big Five personality traits, most notably Conscientiousness, in predicting successful mastery of the transition from school to VET, over and above well-studied determinants such as sociostructural characteristics and cognitive ability, the effects of which

were found to be minor or of no importance in our study. Although the sizes of the effects of Big Five Conscientiousness, Extraversion, and Agreeableness on the individual indicators of success were small, they mostly exceeded those of the other variables, and Conscientiousness was the sole predictor consistently associated with transition success. These findings underscore the need for future research on school-to-work transitions to pay more attention to individual differences in personality traits related to transition success. Study 1 focused on a comprehensive representation of mainly objective indicators of transition success and on personality traits as a source of differences in transition success. However, the subjective side of transition success remained largely unconsidered. Thus, Study 2 was conducted to investigate reasons for individual differences in that subjective side.

### **1.2.3.2 Study 2: Prevalence, Magnitude, and Predictors of the Aspiration–Attainment Gap After School-to-VET Transition**

Like Study 1, Study 2 (Nießen, Wicht, Schoon, & Lechner, 2021) also addressed the first two research questions of this dissertation. Specifically, it focused on the *prevalence*, *magnitude*, and *predictors* of a new transition success indicator, namely, the absence of an occupational aspiration–attainment gap (AAG) after transition from school to VET. Occupational aspirations reflect the expected occupation in the future and, according to several established theories (e.g., social cognitive career theory; theory of circumscription, compromise and self-creation), they are a key component of career development that mediates the effect of individual and sociostructural characteristics and resources on occupational attainment.

The AAG was defined as the failure to realize prior aspirations. Specifically, we analyzed the discrepancy between the SES of occupational aspirations expressed in Grade 9 and the SES of the VET position actually attained after graduation. SES captures not only the income associated with an occupation but also the years of education required to qualify for that occupation; it is thus especially meaningful for further career development. Previous research on school-to-work transitions and career development has mainly either examined the determinants of aspirations and the determinants of the SES of the occupations attained or used aspirations as predictors of attainment. By contrast, both the extent to which adolescents can actually realize their occupational aspirations and the predictors of the occupational AAG (i.e., job fit) have received little research attention to date.

However, understanding differences in the ability to realize one's aspirations, as well as the reasons for these differences, is of enormous importance. The prevalence and magnitude of the occupational AAG can illuminate individual and group differences, thereby providing

important insights into social inequality in school-to-work transition that approaches from previous research could not properly uncover. The AAG indicator has a very specific character and—as an interplay and an actual gap between aspirations and attainment—it captures a subjective, essential view of transition success. This operationalization also contrasts with and complements the seven success indicators from Study 1, which primarily depicted the objective current states of the various phases of transition as well as the final achievement (exception: satisfaction with VET) but did not consider aspirations at all, because this would have gone beyond its scope.

To address the subjective side of the school-to-work transition, in Study 2, we first looked at the frequency and distribution of the AAG, operationalized as the difference score (attainment minus aspirations) among adolescents starting their first VET position after graduation. Second, we sought to ascertain what characteristics contribute to the prediction of whether or not adolescents will experience an AAG. As independent variables, we included sociostructural characteristics (i.e., parental SES, migration background, sex, cultural capital), cognitive ability, school grades (in German and mathematics), and Big Five personality traits, all of which have consistently proved to be predictors of aspirations and/or attainment. All of these variables were measured while the students were still at general education school—that is, prior to the attainment of a VET position. As a mediator variable between the effect of the predictor variables and the AAG, we included in the model the AAG component “occupational aspirations.” As a dependent variable, we created a dummy variable assigning all individuals who realized or even exceeded their aspirations to the reference group, and all individuals who did not succeed in realizing their aspirations to the AAG group. Using data from SC4 of NEPS for 2,478 school leavers who transitioned from intermediate secondary school (*Realschule*) to VET in Germany, we analyzed both direct effects of the predictor variables and indirect effects via the mediator occupational aspirations.

In response to the first aim of Study 2, the results showed that nearly half of the adolescents (46%) did not meet their aspirations to varying degrees, whereas 40% met and 14% surpassed their aspirations, also to varying degrees. In response to the second aim of Study 2, results of path models revealed that the higher the initial level of aspirations, the higher the risk of an AAG. Thus, the level of aspiration was the strongest direct predictor of the AAG. The second highest direct predictor of the AAG was school grades, indicating that lower school grades were linked to a higher probability of experiencing an AAG. In addition, individuals with lower scores on Agreeableness, males, and those with lower parental SES were more likely to experience an AAG. These effects were similar in magnitude but smaller than

those of level of aspiration and school grades. Taken together, these findings imply that characteristics associated with a disadvantaged background (i.e., lower levels of educational achievement and lower family and individual resources) are most likely to predict a higher risk of an AAG. The relative effect sizes of the different predictors on the AAG can be found in Figure 1.4 in Section 1.3.1.1.

Concerning the indirect effects on the AAG mediated by the level of aspirations, higher parental SES was most strongly associated with a higher risk of an AAG, followed by higher school grades, higher cultural capital, and migration background. Higher scores on the personality traits Emotional Stability and Openness were also linked to a higher risk of an AAG, although to a lesser extent than for the other variables. In the case of indirect effects via aspirations, the reverse direction of characteristics (i.e., characteristics associated with a privileged background) was related to a higher probability of an AAG compared with the direct effects. This was the case because higher levels of educational achievement and higher family and individual resources were linked to higher levels of aspirations.

To conclude, Study 2 makes an important contribution to research on school-to-work transitions by complementing the understanding of transition success with a new, subjective indicator and by identifying characteristics that predict which adolescents will or will not be able to realize their occupational aspirations (i.e., goals). In doing so, Study 2 determined the role of different types of influences on the occupational AAG. It revealed that some characteristics were of dual but opposite importance in the prediction of an AAG, in the sense that higher expressions directly decreased the likelihood of an AAG, while indirectly increasing it by enhancing aspirations (e.g., parental SES, female sex, Emotional Stability). Given that just under half of the adolescents in our sample did not fulfill their occupational aspirations, the AAG can be regarded as a widespread phenomenon among young people entering VET in Germany. This deserves further attention—especially, with regard to the longer-term consequences of the AAG over time. To explore these consequences, Study 3 was conducted.

### **1.2.3.3 Study 3: Consequences of Aspiration–Attainment Gaps for Subjective Well-Being After School-to-VET Transition**

As a follow-up study to Study 2, Study 3 (Nießen, Wicht, & Lechner, 2021), addressed the third research question of this dissertation, namely, the *consequences* of successful and unsuccessful transitions from school to VET. More specifically, we examined the role of the occupational aspiration–attainment gap on subjective well-being (SWB) over the course of VET. The occupational AAG (i.e., the discrepancy between the SES of the aspired and at-

tained occupation) is a highly prevalent, not randomly distributed phenomenon in the early career stage in Germany, which can be predicted partly from individuals' sociostructural and individual resources (see Study 2). Given that the German VET system is highly stratified, and a particular VET qualification entitles the holder to work only in the specific field for which they are trained, it is likely that an occupational AAG will persist in later working life and may be detrimental to career development. Hitherto, both the link between these two constructs and the development of SWB in the case of an AAG have rarely been studied—especially not in the German VET context. However, as postulated by several empirically confirmed theories (e.g., level of aspiration theory, multiple discrepancies theory, self-discrepancy theory), it is to be expected that falling short of one's aspirations is associated with feelings of failure and thus with lower SWB, whereas meeting or exceeding one's aspirations is associated with feelings of success and thus with higher SWB.

Therefore, in Study 3, we aimed to uncover the consequences of an occupational AAG for three domains of SWB—namely, general life satisfaction, job satisfaction, and income satisfaction—longitudinally over the course of VET. The reasons for selecting these three domains were threefold: First, they are relevant to job performance and development; second, they do not necessarily have to be rated identically and are not interchangeable; and third, considering more than one SWB domain gives a more complete picture of the AAG–SWB interface. Unlike Study 2, we did not focus only on the negative AAG (i.e., underachievement), but also explored the impact of a positive AAG (i.e., overachievement) as a predictor of SWB. That is, we computed two dummy variables comparing either underachievement or overachievement with the reference group, “no AAG” (i.e., perfect match between the SES of the aspired occupation and attained VET position).

We applied conditional linear latent growth curve modeling and examined the effect of an occupational AAG on (a) the initial level of the three SWB domains shortly after transition to VET; (b) the last level of the three SWB domains after 2 years in VET; and (c) the change in the three SWB domains over the course of 2 years during VET. Along with the two AAG variables, we added the following control variables to our analyses: sociostructural characteristics (i.e., parental SES, migration background, sex), Big Five personality traits, and year of VET entry. As predictors of both the AAG and SWB, evidence from previous studies suggests taking these variables into account as potential confounders. The longitudinal data we used came from a SOEP subsample of 1,536 young adults who had graduated from all three types of secondary schools (*Hauptschule*, *Realschule*, and *Gymnasium*) in Germany and had commenced VET.

Descriptively, the proportion of the sample in Study 3 that experienced a negative AAG was considerable, at 33%—although lower than in Study 2, where 46% of the sample had a negative AAG. By contrast, in over half of the cases (52%), respondents' attainment exactly matched their occupational aspirations, and the remaining 17% even surpassed their aspirations, thereby experiencing a positive AAG. Astonishingly, our multivariate analyses revealed that not only underachievement but also overachievement were negatively related to SWB. More specifically, both types of AAG predicted lower initial levels of the three domains of SWB after VET entry. As depicted in Figure 1.4 in Section 1.3.1.1, we found the strongest effects for the prediction of income satisfaction, followed by job satisfaction, and we found the weakest effects for general life satisfaction. This result partially supports level of aspiration theory and discrepancy theories in the sense that realizing aspirations seemed to be viewed as success and attainments that fell short of prior aspirations as failure. At the same time, however, the results partially refute these theories because attainment that exceeded prior aspirations also seemed to be viewed as failure.

There were also small negative effects of under- and overachievement on the final SWB level reached at the end of VET, but to a lesser extent, indicating an adaptation process during VET. At the end of VET, individuals with an AAG were no longer much less satisfied than those whose attained positions perfectly matched their aspirations. We found similar results supporting this assumption with respect to the development of SWB, as small positive tendencies to report slightly higher increases in income satisfaction, job satisfaction, and general life satisfaction over time were observed among individuals who had fallen short of or exceeded their aspirations.

To sum up, Study 3 extends the literature on school-to-work transition research by examining the consequences of successful and unsuccessful school-to-work transitions—as measured by the absence or presence of an AAG—for SWB during VET. It is a highly important finding that not only negative but also positive occupational AAGs impaired, above all, the level of work-related satisfaction (i.e., income satisfaction and job satisfaction) after entry into VET. This implies that the decisive factor for SWB is not a specific type of AAG (i.e., overachievement and underachievement), but rather the fact that the VET position attained is not the exact occupation aspired to, regardless of whether the SES of the attained position is lower or higher than that of the aspired occupation. Because SWB is a precursor of career development, and because the lower SWB levels of individuals with an AAG tended to remain lower even at the end of VET, the impact of an occupational AAG and the mediating role of SWB on further career progression is worth further exploration—particularly because

the aspirations of adolescents do not necessarily match the VET positions available on the labor market.

## 1.3 General Discussion

The following sections discuss the findings of the three studies in light of the overarching research questions and embed their contributions in the research field of school-to-work transition. First, theoretical implications are highlighted and suggestions for practical implications are made (Section 1.3.1). The limitations of the dissertation are then discussed and directions for future research proposed (Section 1.3.2). A general discussion of the knowledge gained from this dissertation (Section 1.3.3) concludes the chapter.

### 1.3.1 Contributions to the Research Field

#### 1.3.1.1 Theoretical Implications

In the present dissertation, I sought to answer three research questions: (a) What *constitutes* success in the school-to-work transition (i.e., definition of transition success)? (b) What are the *predictors* of different indicators of success in the school-to-work transition? (c) What are the *consequences* of success and nonsuccess in school-to-work transition (i.e., the [absence of an] occupational aspiration–attainment gap) for the further life course? Based on these three research questions and by means of three studies conducted in the specific context of the highly stratified school and VET system in Germany, this dissertation adds theoretical value to existing literature in three respects.

**The Need for a Broader Understanding of Transition Success:** The first theoretical added value concerns two related points: the theoretical contributions to the definition of transition success and the comprehensive operationalization of transition success. Transition success is not a unidimensional construct, but rather must be considered multidimensionally. Operationalizing it with only one indicator of success, for example, simply as attainment (i.e., SES, prestige, or income of the attained occupational position; e.g., Blossfeld, 2017; Schoon & Polek, 2011; Ou et al., 2007) does not go far enough. In order to be able to say whether a particular predictor is important for transition success per se or only for certain indicators, transition success must be understood in a much broader sense than has been the case in previous research. In other words, a whole set of indicators is needed that reflect both the objective and the subjective sides of transition success and capture both the entire transition process

(i.e., from graduation to VET entry and during VET) and the transition outcome (i.e., final grade, SES, etc.).

To meet this need, a total of eight indicators were captured in this dissertation, all of which are positively valued by society, have long-term consequences, and cover different crucial phases of the transition process. Furthermore, in addition to mapping the objective side of transition success with six indicators (obtaining and starting a VET position, number of offers, absence of dropout intentions, absence of actual dropout, final VET grade), this dissertation operationalized the subjective side in three ways: in Study 1 via satisfaction with VET; in Study 2 via the correspondence between occupational aspirations and attainment—a new indicator in psychological school-to-work research; and in Study 3 via the consequences for subjective well-being of mismatches between occupational aspirations and attainment.

The claim that a differentiated view of transition success was taken is also supported by the finding that the predictive power of different variables (i.e., sociostructural characteristics, cognitive ability, personality traits) for the various success indicators was inconsistent. Some of these success indicators were predicted by variables that in turn did not predict other dimensions of transition success (for more details, see the next section, “Conscientiousness Best Predicts Transition Success”). This means that we examined the various indicators of success and their predictors competitively—almost all of them with the same subsample of the same dataset, namely, NEPS. This heterogeneity of the phenomenon of transition success and the importance of clear definitions and a comprehensive operationalization constitute a major insight of this dissertation. One theoretical implication that can be derived from this is that theoretical models of transition success must become more specific and broader in terms of their definition of their main outcome (i.e., transition success). On the other hand, they must take more account of the temporal dimension because success in the transition process (e.g., whether it is smooth or interrupted by dropout; the grades achieved during or at the end of VET) is different from the final outcome of the entire process (i.e., that an apprentice is trained and ends up in a certain skilled position after 3 years, on average).

**Conscientiousness Best Predicts Transition Success:** The second theoretical added value relates to the identification of sources of individual differences that help predict transition success. In the two studies in which transition success was the dependent variable (Studies 1 and 2), three essential independent variable blocks were included: personality traits,



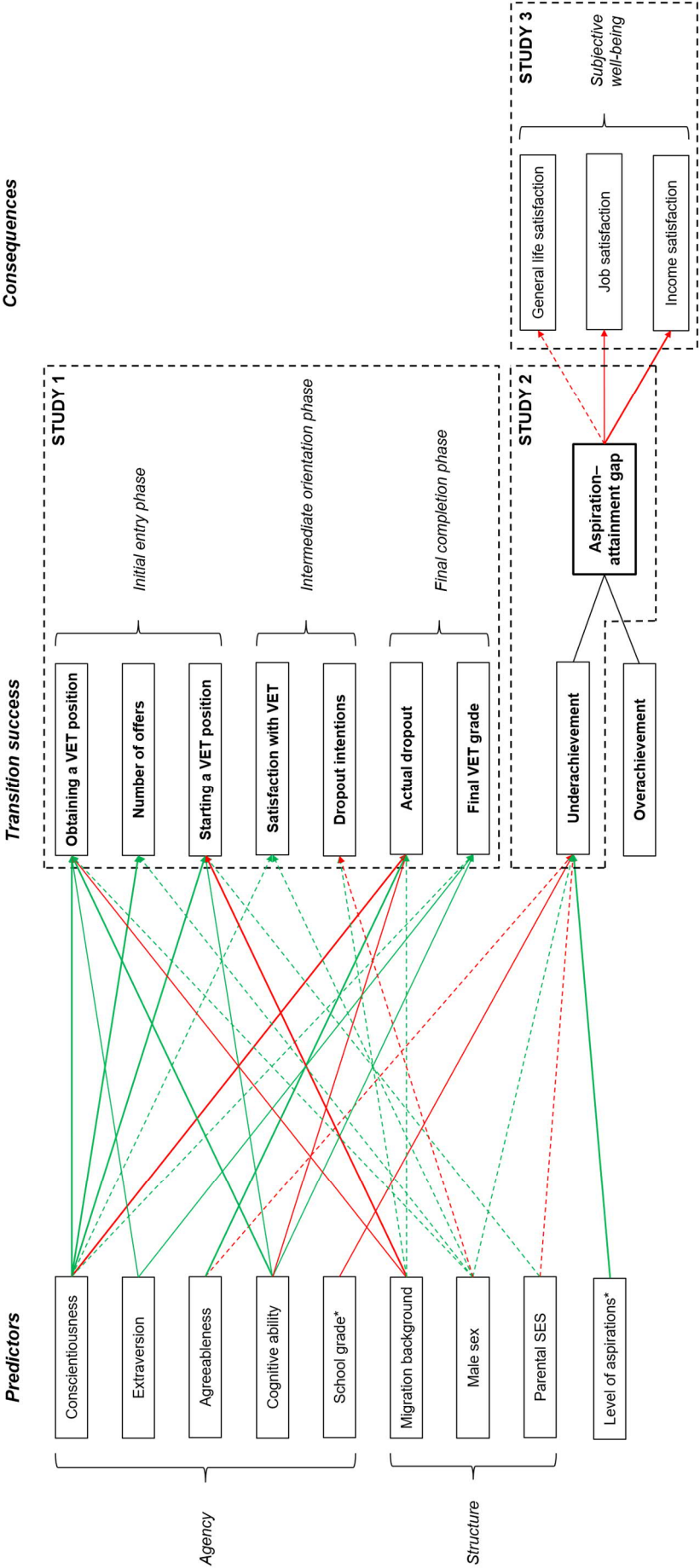
cognitive ability<sup>3</sup>, and sociostructural characteristics. Among these variables and across all outcomes, Conscientiousness was found to have by far the strongest influence on transition success, being relevant to all phases of VET (see Figure 1.4) in the sense that individuals with higher scores on this trait were more likely to make a successful transition from school to work. This is in line with previous research showing that Conscientiousness is the most important personality trait positively related to educational and academic success and is also a selection criterion for employers (e.g., Brandt et al., 2020; Diedrich et al., 2018; Moy & Lam, 2004; Poropat, 2009; Rammstedt et al., 2017). Moreover, two other personality traits—Extraversion and Agreeableness—were relevant to transition success, but only to specific phases and to two indicators in each case (for details, see Figure 1.4). These results are in line with evidence from previous studies demonstrating that Extraversion (e.g., Rammstedt et al., 2017; Wintre & Sugar, 2000) and Agreeableness (e.g., Shanahan et al., 2014; Vedel, 2014) are linked to educational and academic success, but to a lesser extent than Conscientiousness, and these associations have not consistently been reported (e.g., O'Connor & Paunonen, 2007).

Besides personality traits, cognitive ability and some sociostructural characteristics (most notably, migration background and sex) also affected transition success. However, these effects were, in most cases, smaller than those of Big Five Conscientiousness, Extraversion, and Agreeableness, and occurred only for a limited number of indicators (for details of the specific phases and indicators, see Figure 1.4). Consistent with previous research on educational and occupational success, cognitive ability (e.g., Damian et al., 2015; Deary et al., 2007; Kuncel et al., 2004) and the absence of a migration background (e.g., Becker & Schubert, 2011; Damian et al., 2015; McElvany et al., 2018) showed a positive link to transition success. Regarding individuals' sex, being male was mostly beneficial for transition success (see also, e.g., Buttaro et al., 2010; Mello, 2008). However, in one case it was found to have a detrimental effect, leading to a higher risk of an aspiration–attainment gap (see also, e.g., Damian et al., 2015; Paat, 2016).

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<sup>3</sup> Because school grades were included only in Study 2, this variable is not mentioned here when comparing the relevance for the different indicators of transition success. However, the effect of school grades on the aspiration–attainment gap can be found in Figure 1.4.

**Figure 1.4:** Results of Sources of Individual Differences in Success in the Transition from School to Work



*Note.* SES = socioeconomic status, VET = vocational education and training. Green arrows indicate positive effects, red arrows indicate negative effects. The strength of arrows indicates the effect size of a significant predictor relative to the effect sizes of the other significant predictors of transition success: from dashed (*low*) to bold (*high*). Predictors with an asterisk (\*) were included as independent variables in Study 2 only.

This pattern, which seems contradictory at first glance, is consistent with previous findings that men are still preferred on the training market (e.g., Beicht & Walden, 2014)—particularly, for occupations with lower social status (e.g., Kübler et al., 2017). Training occupations that women take up are more often than for men a stopgap solution or an alternative to the occupations they had hoped for (i.e., in terms of content; e.g., Deutscher Gewerkschaftsbund [DGB], 2019). Consequently, women may be more dissatisfied and therefore more willing to drop out of VET (see, e.g., Bundesinstitut für Berufsbildung [BIBB], 2019). However, the fact that women are less likely to attain VET positions with lower SES than that of their aspired occupations may be due to the fact that, on average, they take up VET positions with higher SES than men (e.g., Beicht & Walden, 2014). Unexpectedly, parental SES—a characteristic traditionally considered to be an important determinant of educational, academic, and occupational success (e.g., Damian et al., 2015; Kay et al., 2016; Schoon, 2010)—was not found to be very decisive for transition success, as it was positively associated with only two indicators, and the effect sizes were rather low (for details, see Figure 1.4).

All in all, this pattern of results is a very crucial contribution to the existing body of research, as it shows that transition success is determined not only by sociostructural variables and cognitive ability but also by personality, which plays a very important role, incrementally over and above the other variables. In absolute terms, the predictive power of the Big Five was weak, but relative to the other variables it was very strong in two respects: First, the effects (especially of Conscientiousness) were as large or even larger than those of the other established predictors. Second, Conscientiousness was the only predictor that was consistently related to almost all dimensions of transition success—that is, it was the strongest predictor of transitions success. This finding has a theoretical implication: Developers of models of transition success that aim to identify determinants of transition success or causes of social inequality in transition success are strongly encouraged to consider individual resources such as personality traits in addition to traditionally considered variables such as sociostructural characteristics and cognitive ability.

**Under- and Overachievement Impair Subjective Well-Being:** The third theoretical added value of the present dissertation is the influence of job fit (absence of an occupational aspiration–attainment gap) on individual’s subjective well-being during VET, which we captured more broadly than previous studies. We did so, first, by analyzing not only one but three domains (general life satisfaction, job satisfaction, and income satisfaction); second, we also analyzed the change in subjective well-being over the course of VET in the case of an aspiration–attainment gap in addition to the effect on well-being at only one measurement point.

Consistent with discrepancy theories (e.g., Higgins, 1987; Michalos, 1985), level of aspiration theory (e.g., Starbuck, 1963) and some previous findings (e.g., Beckmann et al., 2021; Carr, 1997; Hardie, 2014), we were able to show that underachieving occupational aspirations was linked to lower subjective well-being in all domains shortly after the start of VET (see Figure 1.4), with a tendency toward the same effect at the end of VET. Nevertheless, a process of so-called *hedonic adaptation* (Brickman & Campbell, 1971) is likely, because the initially lower subjective well-being levels of underachievers increased during VET and were only slightly lower than of those who had perfectly met their aspirations. Similar results have been found in studies on the development of subjective well-being following severe negative life events (e.g., bereavement, divorce, retirement, unemployment; Luhmann et al., 2012). However, this could also be due to the fact that the sample size dropped significantly from the first to the last measurement point, and many of the more dissatisfied under- and overachievers may have dropped out of their first VET position, which is considered a nonsuccess in terms of a smooth transition.

However, the most astonishing result was that the same applied to the overachievement of occupational aspirations, which was also linked to lower levels of subjective well-being (see Figure 1.4), suggesting that apprentices do not seem to be influenced by the social status associated with a particular VET position. This is consistent with the finding that at the end of ninth grade many adolescents—especially those with a lower parental-SES background—have misconceptions about earnings in different occupations and expect lower earning differences between high-income and low-income occupations (Dräger & Wicht, 2021). The well-being of these adolescents is primarily influenced by the question of whether or not the position they have attained corresponds in terms of content, field of activity, etc. to the position they had hoped for. For example, if someone wanted to become a hairdresser but then becomes a bank clerk, they are likely to be more dissatisfied than someone who wanted to become a bank clerk in the first place (and attains the corresponding VET position), even if the VET position attained is associated with higher social status (i.e., SES) than that of the occupation originally aspired to.

In sum, the results strongly suggest that in the choice of apprenticeships and the consequences of unattained aspirations, SES does not matter. Rather, the decisive factor seems to be whether or not the VET position obtained is the exact position that was aspired to. This represents an important new discovery and insight into the role that overachieving occupational aspirations plays in subjective well-being. Furthermore, the fact that both the overachievement and underachievement of occupational aspirations were found to be equally det-

rimental to individuals' well-being leads to a general theoretical implication that underscores the claim made in the section entitled "The Need for a Broader Understanding of Transition Success" above: Focusing on success simply in terms of attainment (i.e., SES, prestige, income, etc.), as has mostly been the case in previous research (e.g., Blossfeld, 2017; Schoon & Polek, 2011; Ou et al., 2007), falls too short because such status-related outcomes obviously do not seem to have the greatest relevance for the individuals themselves when it comes to the consequences of the AAG for subjective well-being. Hence, there is a strong need for a more multidimensional definition of transition success. The fact that apprentices did not seem to be influenced by the social status associated with the VET position attained (i.e., to whether it is objectively regarded as a success) underscores the need to consider the subjective side of transition success (i.e., the individual construction of reality, etc.) in addition to the objective side and to include this multidimensionality in theoretical models.

### **1.3.1.2 Practical Implications**

The present dissertation contributes to the literature by determining factors and consequences of successful school-to-work transitions in Germany. Specifically, by describing the personal background and individual characteristics for transition success, it helps to identify the causes of educational and social inequality and the preconditions for successfully coping with educational or school-to-work transitions. The resulting findings provide a detailed picture of those individuals who successfully master these transitions and those who have difficulties doing so. Therefore, the insights from the three studies can be relevant in practice, especially in terms of decisions and developments in education policy, and initial indicators for possible support and intervention measures, such as counseling or training courses, can be derived from them.

With this dissertation, it was possible to identify at-risk groups that are more likely, for example, to fail to find a VET position or complete VET, or to do so less successfully. Although high Conscientiousness was found to be the most essential factor for the mastery of school-to-work transitions, high Extraversion, low Agreeableness, male sex, and several characteristics associated with a privileged background (i.e., no migration background, higher parental SES, higher cognitive ability) were also positively related to making a successful transition.

In addition to determining causes of transition success per se, this dissertation also improves the understanding of decision-making processes involved in the transition. It shows that a certain personality structure and personal background leads to different transition deci-

sions. For example, individuals with low scores on Conscientiousness and a migration background were more likely to drop out of VET (with females having a higher intention to drop out). A high level of Openness, on the other hand, compensated for background disadvantages in the sense that individuals with low parental SES but high Openness were less prone to drop out of VET than individuals with both low parental SES and low Openness. Regarding the transition decision to start VET, among those who received an offer of a VET position, high Conscientiousness, not having a migration background, higher parental SES, and higher cognitive ability were linked to a higher likelihood of starting VET.

The knowledge of these key factors for transition success can be used to provide scientifically based support in the long term. Interventions could be offered in the school environment to promote and explicitly foster relevant resources and the corresponding behavior (especially Conscientiousness, but also, e.g., Openness), as well as special training, counseling, and assistance (i.e., at school and during VET) to increase students' chances of mastering transitions successfully—particularly, students from disadvantaged backgrounds.

Moreover, Studies 2 and 3 revealed that between one third and half of respondents attained VET positions with lower SES than that of their occupational aspirations, and about 15% attained VET positions with higher SES. This means that, overall, between half and two thirds of respondents experienced an aspiration–attainment gap. Because not realizing occupational aspirations was primarily linked to lower work-related satisfaction, the formation of a realistic idea of the future occupation should also be encouraged during the school years. Ideally, interests, skills, and abilities, as well as the current situation and available VET positions on the labor market should be taken into account.

### 1.3.2 Limitations and Future Directions

Despite its benefits and advances, the present dissertation also has some limitations. First, the studies analyzed a very specific transition of non-college-bound school leavers who started and underwent VET in Germany. Study 3 is an exception in that graduates with a general university entrance qualification (*Allgemeine Hochschulreife*) were also included. This dissertation did not investigate the success of other transitions, for example, the transition from academically oriented secondary schools (*Gymnasien*) to higher education, for two reasons: First, the dataset did not allow for examining such transitions; second, the transition from *Gymnasium* to higher education is quite different in nature and cannot be called a school-to-work transition. Future research is needed to explore whether the findings also apply to other transition types and institutional and national contexts.

The second limitation of the present dissertation stems from the fact that the focus was on the determinants and consequences of success in the school-to-work transition period. Although this phase represents the first step in the labor market and is one of the most critical phases for shaping future occupational career options, we did not investigate the extent to which transition success actually affects career paths and life trajectories after VET completion. If all of the independent variables under investigation are to be included, representative data are not yet available in Germany that would enable longer-term longitudinal analyses of the same cohort in order to follow individuals from the end of schooling to, for example, age 25 or 35, when they are in secure employment or unemployed, for example. In the meantime, however, NEPS data can also be used to examine transitions from VET to the labor market. It is the task of future research to extend the findings obtained in Studies 1, 2, and 3 to the life course on a longer-term basis. As a known predictor of progress-related outcomes, such as work motivation, goal striving, and job change (e.g., Giver et al., 2010; Haase et al., 2012; Ton & Hansen, 2001), the mediating role of subjective well-being between (un)successful transitions and career-related outcomes of success (e.g., dropout vs. completion of VET, employment stability vs. unemployment) is of particular importance in this context and needs further investigation.

A third limitation of this dissertation pertains to the associations between predictor variables and indicators of transition success, and between transition success and subjective well-being. Although the determining variables were measured prior to the variables to be predicted, it is only possible to draw conclusions about tendencies and correlations between the variables. Without running (quasi-)experiments, no reliable statements about causal relationships are possible. Making assumptions about causal relationships is not possible in this type of “real-life” biographical research. In addition, other variables that were not included or were not part of the two secondary datasets used might have had confounding effects. However, the relations found in the three studies are plausible, and comparable associations between the predictor variables used and similar outcomes have been reported in previous literature. Further research using other samples to confirm the findings of this dissertation could corroborate the effects observed.

### **1.3.3 Conclusion**

In conclusion, this dissertation sheds light on success in the transition from school to work via VET in Germany in a broader framework than in previous research work. By means of three studies, the relevance of different background and individual characteristics for transition suc-

cess, as well as the consequences of successful and unsuccessful transitions for subjective well-being were examined. Although the focus was on psychological research, an interdisciplinary approach was taken both in terms of the choice of topics and the theoretical models considered, which included psychological, sociological, and economic theories, and in terms of the co-authors, who included psychologists and sociologists. Two of the three studies (Studies 1 and 2) were conducted as part of two independent projects funded by the Baden-Württemberg Stiftung; the third (Study 3) involved preregistration. Thus, the (main) objectives and expectations for all three studies were set in advance. Furthermore, only publicly available, comprehensive, longitudinal large-scale open secondary data were used, which are much better and more representative than those that individual researchers could ever collect themselves. By using two different datasets, it was also possible to replicate the distribution of the aspiration–attainment gap to some degree. Lastly, the manuscripts of the three studies in this dissertation have been submitted to international journals with high impact factors. Study 1 has already been published, Study 2 has been resubmitted after a “revise and resubmit” decision, and Study 3 is currently undergoing peer review.

The key message of this dissertation is that transition success must be understood and mapped in a differentiated, multidimensional, and interdisciplinary way and that a broad range of success indicators and predictor variables must be included. Hence, a model of sources of individual differences in success in the transition from school to work is proposed that (a) incorporates both the objective and subjective sides of transitions success; (b) covers different phases in the transition; (c) includes the consequences of success and nonsuccess for subjective well-being; and (d) accounts for a wide range of different predictor variables. In order to reduce social inequality and improve career opportunities in the further life course, the interplay of various variables (i.e., personality traits, sociostructural characteristics, cognitive ability, interests, etc.) should be further investigated and compensatory strategies for successfully making the transition from school to work should be promoted while students are still in general education.

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## **2 Study 1:**

# **Big Five Personality Traits Predict Successful Transitions From School to Vocational Education and Training: A Large-Scale Study**

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## 2.1 Abstract

Educational transitions play a pivotal role in shaping educational careers, and ultimately social inequality. Whereas parental socioeconomic status (SES) and cognitive ability have long been identified as key determinants of successful educational transitions, much less is known about the role of socio-emotional skills. To address this gap, the present study investigated whether Big Five personality traits predict success in the transition from secondary school to vocational education and training (VET) above and beyond SES, cognitive ability, and other covariates. Using data from Starting Cohort 4 of the German National Educational Panel Study (NEPS;  $N = 4,137$ ), we defined seven indicators of successful transition: obtaining a VET position, number of offers of VET positions, starting a VET position, (the absence of) dropout intentions and actual dropout, final VET grade, and satisfaction with VET. The results revealed that some Big Five traits were incrementally associated with several indicators of transition success. Conscientiousness emerged as the single most relevant trait, predicting all the transition success indicators but one (dropout intentions). The other Big Five traits had much weaker and less consistent links with transition success. Extraversion predicted the final VET grade and obtaining a VET position; Agreeableness was linked to a higher risk of dropout. Openness and Emotional Stability had no incremental effects on transition success. There was also some evidence for both compensatory and synergistic interactive effects, with Openness moderating mainly the effects of parental SES (on dropout intentions, actual dropout, and number of offers), and Agreeableness moderating the effects of cognitive ability (on obtaining a VET position, number of offers, and satisfaction with VET). Although individual effect sizes were small, the Big Five's joint contribution to transition success was non-negligible, and often larger than that of sociodemographic characteristics and cognitive ability. Our results suggest a hitherto underappreciated contribution of personality to successful transitions to VET.

## 2.2 Introduction

Throughout their educational careers, individuals are faced with various transitions, such as the transition from primary to secondary school or—in the German context—from secondary school to vocational education and training (VET) or higher education. By sorting individuals into different educational trajectories, educational transitions enable or constrain the range of possible options available to individuals in the future (Blossfeld et al., 2019; Erikson, 2019; Kogan, 2019; Stocké, 2019). By virtue of this, educational transitions play a pivotal role in shaping individuals' long-term educational attainment, career prospects, and a range of associated outcomes such as health and well-being (Klein et al., 2009; Maaz et al., 2006; Schoon & Silbereisen, 2009).

Given the long-term consequences of educational transitions, it is important to understand why some individuals master such transitions successfully, whereas others do less well. Hence, successful transitions can be seen as an additional aspect of educational success, next to educational attainment and achievement. In this regard, previous research has identified several sources of individual differences in transition success, although their individual contributions are often small: sociodemographic characteristics (e.g., Becker & Schubert, 2011; Blossfeld & Shavit, 1993; Duncan and Brooks-Gunn, 1997); contextual factors such as social relationships or learning environments (e.g., Griebel, 2011; Griebel & Niesel, 2004); and cognitive ability (e.g., Gustafsson & Undheim, 1996). In contrast, little is known about the role of so-called socio-emotional (or “non-cognitive”) skills such as the Big Five personality traits (Costa & McCrae, 1992; Goldberg, 1992) in shaping educational transitions. Although a growing body of evidence attests to the incremental predictive validity of the Big Five for educational achievement and attainment (for a recent review, see Lechner et al., 2019), empirical studies on the role of socio-emotional skills in the success of educational *transitions* are almost absent from the literature.

Therefore, the question we addressed in the present study was: Can personality traits—understood as a proxy of socio-emotional skills—add to our understanding of why some individuals master educational transitions better than others? To address this question, we investigated whether the Big Five personality traits predict success in the transition from secondary school to VET in the German context. For this purpose, we leveraged data from a large-scale German panel study in which ninth-grade students were followed across the transition to VET. The German “dual system” of vocational education and training combines schooling with an apprenticeship (i.e., on-the-job training) at a company. Over the course of 2–3 years,

apprentices spend part of their time at a company, where they get extensive training in a specific occupation, and the other part at a vocational school, where they receive education in occupation-related subjects (Heckhausen & Tomasik, 2002).

## **2.3 Theoretical Background**

### **2.3.1 Established Predictors of Educational Achievement and Successful Transitions**

Previous research has identified several determinants and correlates of educational achievement and attainment, including successful transitions. Sociological research has focused mainly on the role of parental SES, sex, and migration background in predicting educational success (e.g., Becker & Schubert, 2011; Blossfeld & Shavit, 1993; Duncan & Brooks-Gunn, 1997; Klein et al., 2009; McElvany et al., 2018; Paat, 2015; Schoon, 2010). Psychological research has highlighted the crucial role of cognitive ability in shaping learning, and ultimately achievement and attainment (e.g., Deary et al., 2007; Kuncel et al., 2004; Roth et al., 2015). Research in educational science has focused additionally on the role of contextual factors such as social relationships or learning environments (e.g., Griebel, 2011; Griebel & Niesel, 2004). Among these determinants, sociodemographic characteristics and cognitive ability have typically shown the strongest links to educational success.

Although these predictors explain individual differences in educational achievement (e.g., grades) and attainment (e.g., the highest educational qualification obtained), their predictive power vis-à-vis educational *transitions* is limited. Thus, our understanding of transition success remains incomplete. Another important consideration is the nature of these predictors: parental SES and cognitive ability can hardly be changed. From a policy and intervention perspective, it would therefore be desirable to identify more malleable factors that contribute to successful educational transitions and that could be targeted by programs aimed at helping young people to master educational transitions. Here, we propose that socio-emotional skills—in particular the Big Five personality traits—might add to our understanding of transition success over and above the aforementioned established predictors.

### **2.3.2 Personality Traits as Predictors of Educational Achievement**

“Socio-emotional skills” is an umbrella term used to denote a broad set of individual difference constructs such as personality traits, motivation, and values. The common denominator

of these constructs is that they refer to relatively consistent patterns of behavior, cognition, and affect that—although having a genetic basis—can be influenced by socialization and learning/experience, develop in interaction between environmental influences and biological predispositions, cannot easily be acquired, and have beneficial effects on relevant educational and life outcomes (see Abrahams et al., 2019; De Fruyt et al., 2015; Lechner et al., 2019). The Big Five framework (Costa & McCrae, 1992; Goldberg, 1992) is currently the most established and well-validated model of personality traits and is often used as a guiding framework in studies on socio-emotional skills. The framework comprises five global dimensions: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness to Experience (henceforth only called Openness).

There is already a growing body of evidence pointing to incremental associations of the Big Five with success at school and at college/university as well as with career success—often over and above parental socioeconomic status (SES) and cognitive ability. Several meta-analyses (e.g., Poropat, 2009; Vedel & Poropat, 2017) and recent (large-scale) studies (e.g., Bergold & Steinmayr, 2018; Brandt et al., 2020; Lechner et al., 2017; Spengler et al., 2013, 2016) have identified Conscientiousness and Openness as the personality traits most relevant to educational achievement and attainment in both secondary and tertiary level students. Some of these studies (Brandt et al., 2020; Lechner et al., 2017; Spengler et al., 2016) showed that Conscientiousness was positively related to school grades and achievement test scores even when cognitive ability was controlled for. Similarly, Poropat's (2009) meta-analysis of personality–academic performance relationships based on the Big Five model demonstrated that the effect sizes of Conscientiousness for school achievement (assessed by grades and grade point average [GPA]) rivaled that of cognitive ability and were incremental over—and independent of—cognitive ability. Recently, Diedrich et al. (2018) showed that Conscientiousness was the most robust positive predictor of GPA (achievement)—also specifically among VET students. Rammstedt et al. (2017) demonstrated a positive relationship between Conscientiousness and level of education (i.e., attainment). Openness was found to have positive but small associations with GPA and grades (i.e., achievement; Spengler et al., 2016) as well as with achievement test scores (Spengler et al., 2013) at school and university (Richardson et al. 2012; Trapmann et al., 2007; Vedel, 2014). Findings from a study on life outcomes identified a positive relationship between Openness and level of education (i.e., attainment; Rammstedt et al., 2017).

Agreeableness, Emotional Stability, and Extraversion have been found to have weaker and more inconsistent associations with educational and academic performance (e.g., Caspi et



al., 2005; Lechner et al., 2017; Poropat, 2009; Vedel & Poropat, 2017). Agreeableness has been shown to have positive but small associations with GPA/grades (achievement; Poropat, 2009; Richardson et al., 2012; Vedel, 2014) and a positive relationship with life satisfaction (Rammstedt et al., 2017). Regarding Emotional Stability, Rammstedt et al. (2017) identified a positive relationship with level of education (attainment) and with life satisfaction. Concerning academic satisfaction, results of Trapmann et al. (2007) indicate a positive association with Emotional Stability. Finally, Rammstedt et al. (2017) found a negative relationship between Extraversion and the highest level of education (attainment). In sum, the Big Five have repeatedly replicated robust effects on a range of educational outcomes, above and beyond parental SES and cognitive ability.

### 2.3.3 Personality Traits as Predictors of Successful Transitions

Are the Big Five personality traits as potent in predicting transition success as they are in predicting educational achievement and attainment? Extant findings refer only to a narrow set of global success indicators (such as GPA or the highest level of educational attainment; see above) and, in part, only to a priori selected personality traits such as Conscientiousness (Libbrecht et al., 2014; Shanahan, Hill, et al., 2014) or Extraversion and Neuroticism (Vasileva-Stojanovska et al., 2015). Other aspects of the transition process that constitute success, such as obtaining a VET position in the first place, have been neglected to date. This dearth of evidence may stem partly from the fact that there are few established indicators of successful transitions to VET—an issue that we addressed in the present study by operationalizing success in the transition to VET in a comprehensive fashion (see Section 2.3.4).

There is good reason to expect that the Big Five personality traits can contribute to transition success. We theorize that there are two principal pathways through which socio-emotional skills such as the Big Five personality traits might influence the success of educational transitions. Both of these pathways draw on an *integrative social-ecological developmental model of agency* that investigates the interplay of agency and structure in school-to-work transitions and the multiple influences shaping these transitions (Schoon & Heckhausen, 2019). The first pathway is individuals' behavior during the transition process. Personality traits are psychosocial and self-regulatory resources (i.e., skills) that can be harnessed to select and pursue goals. In other words, they might foster individual agency during educational transitions (DeYoung, 2013; Heckhausen et al., 2010; Lechner et al., 2019). According to Schoon & Heckhausen (2019), “individual agency is most needed at times of transition, when individuals leave a pre-structured path.” Individual agency depends on resources such as the

Big Five personality traits, which can therefore be regarded as prerequisites for agency, or, in economic terms, as human capital. For example, Extraversion and Agreeableness might help young people to build social relationships that can be instrumental in finding a VET position, and Conscientiousness might help them to prepare good application documents. Employers' perception of VET applicants is the second pathway through which personality traits might act. It is likely that desirable and undesirable Big Five personality traits will be perceived by employers during the selection process and consequently rewarded or punished. For example, employers may choose VET applicants whom they perceive to be especially conscientious (e.g., Caldwell & Burger, 1998; Dunn et al., 1995; Moy & Lam, 2004), or they may prefer candidates who are emotionally stable (e.g., Caldwell & Burger, 1998; Dunn et al., 1995). We assume that the two pathways—individuals' behaviors and employers' perceptions—are inextricably linked, and that they contribute to transition success in complementary ways.

Irrespective of the specific pathways through which personality traits may affect transition success, their associations with indicators of transition success can take two main forms: additive and interactive. An additive effect (or “main effect”) would mean that personality has an incremental linear association with transition success above and beyond the effects of other predictors, such as parental SES and cognitive ability.

An interactive effect (or “moderation effect”) would imply that the strength of other predictors, such as parental SES or cognitive ability, varies in dependence on personality. Such interactive effects may be compensatory or synergistic in nature. According to *resource substitution theory* (Mirowsky & Ross, 2003), low resources in one domain can be substituted by resources in another domain. For example, cognitive ability may be more important for individuals with low SES, because high cognitive ability can compensate for low SES. This suggests that personality traits such as Conscientiousness may also be able to compensate for low SES or low cognitive ability. In contrast, a synergistic interactive effect is an effect where high resources in one domain augment the effect of resources in another domain. According to Damian et al.'s (2015) *Matthew effect hypothesis* (the Matthew effect was originally operationalized by Merton, 1968), personality traits are more relevant under advantaged developmental conditions such as a higher level of parental SES.

Only a few studies have tested possible interactive effects of personality with SES and cognitive ability. For example, Sackett et al. (1998) and Danner et al. (2019) found interactions between personality and sociodemographic factors in predicting job performance. Even fewer studies have tested such compensatory or synergistic effects with regard to educational outcomes (e.g., Ayoub et al., 2018; Bergold & Steinmayr, 2018; Damian et al., 2015;

Rammstedt et al., 2016; Shanahan, Bauldry, et al., 2014). For example, with regard to the prediction of educational attainment, Ayoub et al. (2018) reported a compensatory interactive effect between parental SES and Emotional Stability, Openness, Conscientiousness, and Agreeableness; Damian et al. (2015) reported a compensatory interactive effect between parental SES and Conscientiousness, Agreeableness, and Extraversion; and Shanahan, Bauldry, et al. (2014) reported a compensatory interactive effect between parental SES and Agreeableness, Extraversion, Openness, and Emotional Stability. Results from Bergold and Steinmayr (2018) suggest positive interactive associations between cognitive ability and Conscientiousness and Emotional Stability in predicting senior secondary school GPA. Rammstedt et al. (2016) found a negative interactive effect between Conscientiousness and labor force participation and a positive interactive effect between Openness and educational attainment in predicting cognitive ability.

### 2.3.4 The Present Study

In sum—despite empirical evidence of robust links between personality and educational success in general—it remains largely unclear whether the Big Five personality traits play a role in shaping educational transitions. To close this research gap, we investigated in the present study whether the Big Five personality traits predict success in the transition from general secondary or intermediate secondary school (*Hauptschule* and *Realschule*) to VET above and beyond parental SES, sex, migration background, and cognitive ability. Moreover, we aimed to identify the specific role of personality in shaping transition success by testing whether the Big Five show mainly additive associations with transition success (i.e., main effects), or whether they also moderate the effects of other established predictors of transition success, in particular parental SES and cognitive ability (i.e., interactive effects). Because there is little previous work to build on, the latter analyses of interactive effects are purely exploratory in nature. We comprehensively operationalized transition success with the following seven indicators (for details, see Section 2.4.2.2): obtaining a VET position, number of offers, starting a VET position, (absence of) dropout intentions, (absence of) actual dropout, final VET grade, and satisfaction with VET.

Based on previous findings on how the Big Five contribute to educational achievement and attainment (e.g., Brandt et al., 2020; Lechner et al., 2019; Spengler et al., 2013, 2016), we expected Conscientiousness, Emotional Stability, Openness, and Extraversion to have consistently positive associations with all aspects of transition success above and beyond the effects of the covariates (additive effects). For Agreeableness, we had no specific expectation,

and we examined its effects in an exploratory fashion. The rationale behind our expectations was as follows: We presumed that Conscientiousness would manifest itself in performance effort and application behavior in terms of the number and type of applications. In addition, Conscientiousness itself could be a criterion in the selection process. Emotional Stability could manifest itself in a better handling of demands and overextension. In addition, Emotional Stability could curb test anxiety or anxiety during the application procedure. We assumed that Openness would lead to more creative apprenticeship search strategies and to greater openness toward different sectors. Extraversion describes the tendency to engage in social behavior and could therefore be helpful for acquiring a social network. Furthermore, Extraversion could manifest itself in assertiveness in the application procedure. Agreeableness could also foster the development of a social network by being cooperative and compassionate. Additionally, Agreeableness could reflect sympathy, which appears to be beneficial in selection procedures. In contrast, low Agreeableness may be accompanied by high task orientation, which is also relevant to success.

We further expected that, in addition to having additive effects, personality traits would moderate the associations between established predictors of transition success—namely, parental SES and cognitive ability—and our seven success indicators. Given the lack of previous evidence and pertinent theorizing regarding possible interactions between personality and sociodemographic characteristics or cognitive ability, we refrained from formulating specific hypotheses in this regard. Instead, we tested these interactive effects in an exploratory fashion. We classified any interaction that emerged according to whether it was compensatory or synergistic in nature.

## **2.4 Material and Methods**

### **2.4.1 Database and Sample**

We used data from the German National Educational Panel Study (NEPS): Starting Cohort 4 (Grade 9; Blossfeld & Roßbach, 2011; <https://doi.org/10.5157/NEPS:SC4:9.1.0>). NEPS is an ongoing longitudinal multi-cohort panel study. Starting Cohort 4 comprises students who were attending ninth grade in the 2010/2011 school year. Students from this cohort were first interviewed in autumn/winter 2010/2011 (Wave 1), when they were in ninth grade. They were re-interviewed biannually until spring 2013 (Waves 2–6) and annually thereafter until autumn 2015/spring 2016 (Waves 7–9). The survey mode varied between paper-and-pencil interview-

ing (PAPI) for students and computer-assisted telephone/personal interviewing (CATI/CAPI) for school leavers. For the present research, we used data from Waves 1–7. For every individual, information on the variables was assessed once. Information on personality traits, socio-demographic variables, and cognitive ability was gathered in Grade 9 (Waves 1–2) before the transition from school to VET. Information on the success indicators was gathered within Waves 3–7.

Germany has a very stratified school and vocational training system. After primary school, students are selected into different school types: *Hauptschule* (general secondary school providing a basic secondary education), *Realschule* (intermediate secondary school), and *Gymnasium* (academically oriented secondary schools or school tracks). Graduates from *Hauptschule* leave the school system after ninth grade at the age of 15, graduates from *Realschule* after 10th grade at the age of 16, and graduates from *Gymnasium* after 12th or 13th grade at the age of 18 or 19 with different levels of school-leaving qualifications. Graduates from *Hauptschule* and *Realschule* are eligible to do a VET, while graduates from *Gymnasium* have the possibility to go to college/university.<sup>4</sup> In addition to these three “regular” school types, there are so-called *Förderschulen* (special schools), which students with disabilities, such as learning, physical, or developmental disabilities, attend.<sup>5</sup>

Beginning with  $N = 16,425$  participants, we reduced the sample to individuals who had graduated from *Hauptschule* after ninth grade or from *Realschule* after 10th grade, and for

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<sup>4</sup> Between 2011 and 2014, on average 17% graduated from *Hauptschule*, 53% from *Realschule*, and 30% from *Gymnasium*. On average 98% graduates from *Hauptschule* started either a VET or a prevocational training program and less than 2% continued schooling for acquiring a university entrance qualification. On average 46% graduates from *Realschule* started either a VET or a prevocational training program and 54% continued schooling for acquiring a university entrance qualification. On average 19% graduates from *Gymnasium* started VET and 81% went to college/university (Statistisches Bundesamt [Destatis], 2013, 2014a, 2014b, 2015).

<sup>5</sup> As the present study focused on VET-bound students on a vocational track graduating after ninth and 10th grade and entering VET positions, a brief description of the German dual education system, a system before labor market entry (i.e., of initial vocational training; Protsch & Soga, 2016), is needed. VET combines a on average 3-year company-based training in a specific occupation or trade, such as banker, geriatric nurse, plumbing and heating installer, or baker, with a 2-day-per-week school-based education in occupation-related subjects, such as accounting, hygiene, or medical engineering (e.g., Heckhausen & Tomasik, 2002). In some dual educational structures, for example, a 2-week training in a company alternates with a 2-week school education. Not all VET programs are eligible for all graduates, that is, some require an intermediate school-leaving qualification (*Mittlere Reife*), such as mechatronics technicians, industrial mechanics, or management assistants in wholesale, and others even a higher education entrance qualification (*Abitur*), such as bank clerks, insurance clerks, or IT specialists (Protsch & Solga, 2016). As a consequence, “access to the different occupations offered in the apprenticeship system is itself highly stratified by school attainment” (Protsch & Solga, 2016, p. 645).

whom data were available since Wave 1 ( $n = 16,052$ ). The reason why we only investigated the transition from school to VET was that the dataset simply did not allow investigating other transitions. We excluded students from *Gymnasium* because no student from this school type in the sample transitioned to VET during the observation period ( $n = 5,568$ ). We also excluded students from *Förderschulen* ( $n = 1,186$ ) because they cannot be compared to students from “regular” schools and students from Waldorf schools ( $n = 171$ ) because these schools are based on a completely different pedagogical principle compared to “regular” schools without, for instance, grading or grade retention. We also excluded students with wave-specific temporary or final dropouts (e.g., no data available since graduation or individual tracking no longer possible;  $n = 3,556$ ); students whose first vocational track did not begin until Wave 8 or 9 ( $n = 530$ ); students with inconsistent spell data (e.g., because they entered a vocational preparation program [*Berufsvorbereitung*] or underwent vocational training prior to graduation;  $n = 311$ ); and students with missing values on the Big Five questionnaire ( $n = 416$ ). This resulted in a total of 4,314 school leavers. The mean age of the students in the first wave was 15.3 years ( $SD = 0.7$ ; 42.4% female).

Most of these school leavers ( $N = 4,137$ ; 96%) applied for a VET position within the first year after graduation. The majority among them ( $N = 3,524$ ; 85%) obtained an offer of a VET position; 68% ( $N = 2,411$ ) of those who obtained an offer actually started VET within the first year after graduation.

## 2.4.2 Measures

### 2.4.2.1 Big Five Personality Traits

The Big Five personality traits were assessed with the 10-item Big Five Inventory (BFI-10; Rammstedt & John, 2007) plus one additional item for the Agreeableness domain. The BFI-10(+1) is an established and widely used 10-item short scale with two items per dimension that is used, for example, in the World Value Survey (WVS) and in the International Social Survey Programme (ISSP) and has satisfying psychometric quality criteria (e.g., Rammstedt & John, 2007; Rammstedt et al., 2014). All 11 items were to be answered on a 5-point response scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). In the present sample, internal consistency (as measured by the Spearman-Brown formula, which is appropriate for two-item scales) for the Big Five dimensions ranged from .35 (Agreeableness) to .55 (Extraversion). These values are sufficient for two-item scales because the items are designed to assess heterogeneous facets of the Big Five dimensions (Rammstedt and John, 2007). Im-

portantly, previous research has shown that the BFI-10(+1)'s test-retest reliabilities are much higher (on average  $r = .75$ ; see Rammstedt & John, 2007) than its internal consistencies. Furthermore, the BFI-10(+1)'s predictive validity for a broad range of criteria has been shown to be as high as—and sometimes higher than—that of much longer Big Five scales (Thalmayer et al., 2011). Because the BFI-10 is a balanced scale, the scale scores implicitly control for acquiescence. Therefore, we used the manifest scale scores (Big Five personality traits and covariates) as predictors, and we modeled the interactions between personality traits and covariates as multiplicative terms (as centered variables, except for migration background). Negatively keyed items were recoded beforehand.

#### **2.4.2.2 Transition Success Indicators**

There is no clear consensus in the literature on school-to-work transitions as to what constitutes a successful transition to VET. Consequently, to address our research questions, we first defined what constitutes a successful transition to VET and selected appropriate success indicators. Our criteria for selecting these success indicators were that the indicator should (a) be positively valued by individuals and society and (b) have long-term consequences for individuals' further life chances. Thus, the indicators should capture a normative understanding of transition success from a life-course perspective. Moreover, (c) the indicators should refer to a critical phase of the transition from school to VET—namely, the initial phase (1 year after leaving school), the intermediate phase (1 year after starting a VET position), or the concluding phase (during VET). In line with these criteria, we selected the following seven success indicators in order to obtain a depiction of transition success as comprehensive as possible with the given data (NEPS dataset): (a) obtaining a VET position within 1 year after graduation (i.e., offer by an employer after the submission of an application); (b) number of offers of VET positions within 1 year after graduation; (c) starting a VET position within 1 year after graduation (given the receipt of an offer of a VET position); (d) (absence of) dropout intentions; (e) (absence of) actual dropout; (f) final VET grade; and (g) satisfaction with VET after 1 year in a VET position.

Obtaining a VET position was operationalized with 0 (*no*) versus 1 (*yes*). The number of offers of VET positions was assessed with the question “How many [offers] did you get in all? [Please] tell me the number of apprenticeships you were offered.” (NEPS, 2016, p. 406) and ranged from 0 to 20. Starting a VET position was operationalized with 0 (*no*) versus 1 (*yes*). Dropout intentions were assessed with the question “Are you seriously considering at this time changing or dropping out of your apprenticeship/vocational training program?”

(NEPS, 2016, p. 668). Possible answers were 0 (*no*) or 1 (*yes*). Actual dropout was measured with the question “Did you end the vocational training early or did you stay to the end but not earn the qualification?” (NEPS, 2016, p. 551). Possible answers were 0 (*no*) or 1 (*yes*). The final VET grade was measured with the question “What was your overall grade for this vocational training program?” (NEPS, 2016, p. 549) and theoretical ranges—after recoding (7 – raw score)—from 1 (*low*) to 6 (*high*); in the present sample, the values ranged from 2.8 (*low*) to 6.0 (*high*). Satisfaction with VET was assessed with the question “How satisfied are you with your vocational training program?” (NEPS, 2016, p. 654) on a scale ranging from 0 (*completely dissatisfied*) to 10 (*completely satisfied*).

### 2.4.2.3 Control Variables

We included the following established predictors of transition success as statistical control variables in order to investigate the incremental predictive power of personality traits: (a) parental SES (International Socio-Economic Index of Occupational Status 2008 [ISEI-08; Ganzeboom et al., 1992]; ISEI describes the occupational status as both level of education needed for a specific occupation and the corresponding income of that specific occupation [Züll, 2016] ranging from 11.56 [*low*; i.e., farmers] to 88.96 [*high*; i.e., judges]; it was assessed with the open question “What [is] your parents['] current [occupation]? [For example,] car mechanic, sales clerk, teacher [at a Gymnasium], civil engineer. If your mother or your father does not have a job at present, please think of her [or] his last employment.” (NEPS, 2013, p. 13) and then assigned to different codings of standard categorization schemes of occupations, among others ISEI—if a student’s parents had different values, we used the highest ISEI in the family); (b) migration background (captured via the proxy of having German as a mother tongue; 0 [*no*] vs. 1 [*yes*]); (c) sex (1 = *male*, 2 = *female*); and (d) cognitive ability. Cognitive ability was assessed with the NEPS reasoning test (NEPS-MAT), a figural reasoning task that measures general cognitive ability with 12 items (see Pohl and Carstensen, 2012) ranging from 0 (*low*) to 12 (*high*). In the present sample, internal consistency (Cronbach’s  $\alpha$ ) was .66.

### 2.4.3 Analysis

We examined the association between transition success and personality with ordinary least squares (OLS) regression models for the quasi-continuous dependent variables (number of offers of VET positions, final VET grade, and satisfaction with VET) and logistic regressions for the dichotomous dependent variables (obtaining a VET position, starting a VET position,



[absence of] dropout intentions, and [absence of] actual dropout). To facilitate the interpretation of the results of the logistic regressions, we report the average marginal effects (AMEs). AMEs have a straightforward interpretation as probabilities.

In the first step, we analyzed the association between the Big Five traits and the seven indicators of transition success (Model I). In the second step, we added the covariates in order to examine whether the Big Five incrementally predicted transition success over and above these covariates (Model II). In the third and fourth steps, we additionally included interaction terms between the Big Five traits and one covariate at a time—cognitive ability in the third model, parental SES in the fourth model—in order to examine whether personality traits moderated the association between parental SES, cognitive ability, and success (Models III–IV). To keep the sample size within each dependent variable equivalent across the individual models (I–IV), we used complete case analysis and only analyzed data of students without missing values on the independent variables. The statistical analyses were run with Stata.

## 2.5 Results

### 2.5.1 Descriptive Statistics

Descriptive statistics for the personality traits, the covariates, and the success indicators are depicted in Table 2.1. As can be seen from that table, there was substantial variation in all variables. Table 2.2 shows the correlations between Big Five traits, the success indicators, and the covariates. As can be seen from that table, there were small associations between Extraversion, Emotional Stability, Openness, and in particular Conscientiousness and several success indicators ( $-.10 \leq r \leq .08$ ), suggesting that personality is related to at least some of our transition success indicators. Table 2.2 further reveals that the Big Five personality traits were moderately associated with cognitive ability ( $-.10 \leq r \leq .06$ ), parental SES ( $-.08 \leq r \leq .06$ ), migration background ( $r = .06$ ), and sex ( $-.21 \leq r \leq .19$ ). We therefore used multiple regression analyses to examine whether the Big Five explained transition success above and beyond sociodemographic characteristics and cognitive ability.

### 2.5.2 Multivariate Models Predicting Successful Transitions

The regression estimators for the seven success indicators are displayed in Tables 2.3–2.9 (unstandardized coefficients; *b* for quasi-continuous outcomes; AMEs for dichotomous out-

comes). Statistically significant interactions are additionally depicted in Figures 2.A1–2.A6 in the Appendix. We report only statistically significant effects ( $p < .05$ ) in the text.

**Table 2.1:** *Descriptive Statistics for Continuous and Categorical Variables*

Continuous variables	<i>M</i>	<i>SD</i>	No. of items	Cronbach's $\alpha$	<i>N</i>
Extraversion	3.41	0.87	2	.55	4,314
Agreeableness	3.46	0.68	3	.34	4,314
Conscientiousness	3.20	0.87	2	.46	4,314
Emotional Stability	3.22	0.85	2	.35	4,314
Openness	3.35	0.93	2	.36	4,314
Cognitive ability	7.71	2.59	12	.66	3,993
Parental SES	43.57	18.16	1		3,701
Number of offers of VET positions	1.89	2.31	1		3,238
Final VET grade	2.53	0.65	1		954
Satisfaction with VET	8.17	1.53	1		1,811
Categorical variables	Categories				<i>n</i>
Obtaining a VET position	0: No				613
	1: Yes				3,524
Starting a VET position	0: No				1,113
	1: Yes				2,411
Dropout intentions	0: No				2,222
	1: Yes				118
Actual dropout	0: No				2,107
	1: Yes				304
Sex	1: Male				2,484
	2: Female				1,830
Migration background	0: German as mother tongue				3,779
	1: Other mother tongue(s)				490

*Note.* SES = socioeconomic status, VET = vocational education and training. The Big Five scores range between 1 and 5 (*strongly disagree–strongly agree*); cognitive ability ranges between 0 and 12 (sum score); parental SES ranges between 11.56 and 88.96 (*low–high*); number of offers ranges between 0 and 20; final VET grade ranges between 0 and 4.2 (*high–low*); satisfaction with VET ranges between 0 and 10 (*completely dissatisfied–completely satisfied*).

**Table 2.2:** *Correlations Between the Big Five Personality Traits and the Success Indicators and Covariates*

	<i>N</i>	Extraversion			Agreeableness			Conscientiousness			Emotional Stability			Openness		
		<i>r</i>	95% CI	<i>p</i>	<i>r</i>	95% CI	<i>p</i>	<i>r</i>	95% CI	<i>p</i>	<i>r</i>	95% CI	<i>p</i>	<i>r</i>	95% CI	<i>p</i>
Success indicators																
Obtaining a VET position	4,137	<b>.04</b>	[.01, .07]	.022	-.01	[-.04, .02]	.624	<b>.04</b>	[.01, .07]	.006	<b>.03</b>	[.00, .06]	.046	-.02	[-.05, .01]	.172
Number of offers	3,238	.02	[-.02, .05]	.312	.03	[-.01, .06]	.092	<b>.06</b>	[.02, .09]	.001	.02	[-.01, .06]	.162	-.00	[-.04, .03]	.831
Starting a VET position	3,524	-.01	[-.04, .03]	.698	-.02	[-.05, .02]	.299	.02	[-.01, .06]	.177	<b>.04</b>	[.00, .07]	.036	-.01	[-.05, .02]	.422
Dropout intentions	2,340	.01	[-.03, .06]	.495	-.03	[-.07, .01]	.177	-.03	[-.07, .01]	.198	.02	[-.02, .06]	.387	.03	[-.01, .07]	.199
Actual dropout	2,411	.03	[-.01, .07]	.211	.03	[-.01, .07]	.184	<b>-.05</b>	[-.09, -.01]	.027	-.01	[-.05, .03]	.752	.03	[-.01, .07]	.135
Final VET grade	954	<b>.10</b>	[.04, .16]	.002	-.01	[-.08, .05]	.714	.05	[-.01, .11]	.128	.06	[-.01, .12]	.083	<b>.09</b>	[.02, .15]	.009
Satisfaction with VET	1,811	-.00	[-.05, .05]	.997	.04	[-.01, .09]	.101	<b>.08</b>	[.03, .12]	.001	<b>.07</b>	[.02, .11]	.005	-.04	[-.09, .01]	.089
Covariates																
Cognitive ability	3,993	<b>-.06</b>	[-.09, -.03]	<.001	.02	[-.01, .06]	.134	<b>-.10</b>	[-.13, -.07]	<.001	<b>.05</b>	[.02, .08]	.002	<b>.06</b>	[.03, .09]	<.001
Parental SES	3,701	<b>.04</b>	[.01, .07]	.010	<b>-.05</b>	[-.08, .01]	.005	<b>-.08</b>	[-.11, .04]	<.001	<b>.05</b>	[.01, .08]	.005	<b>.06</b>	[.02, .09]	.001
Female	4,314	.02	[-.01, .05]	.235	<b>.12</b>	[.09, .15]	<.001	<b>.19</b>	[.16, .22]	<.001	<b>-.21</b>	[-.24, .19]	<.001	<b>.17</b>	[.14, .20]	<.001
Migration background	4,269	-.01	[-.04, .02]	.631	.01	[-.02, .04]	.433	<b>.06</b>	[.03, .09]	<.001	-.02	[-.05, .01]	.290	.03	[-.01, .06]	.099

*Note.* CI = confidence interval, VET = vocational education and training, SES = socioeconomic status. Coefficients significant at the  $p < .05$  level are in bold type.

### 2.5.2.1 Obtaining a VET Position

Our first success indicator was obtaining a VET position within 1 year after graduation (given the submission of an application). As shown in Table 2.3, high Conscientiousness was associated with a 1.7 % higher likelihood of obtaining a VET position, and high Extraversion was associated with a 1.5% higher likelihood. Overall, personality explained 0.6% of the variance (*Pseudo R*<sup>2</sup>; Model I). Analyzing the effects of personality traits and covariates simultaneously, Model II explained 2.8% of the overall variance (*Pseudo R*<sup>2</sup>) and indicated a significant association between high cognitive ability (0.8% higher likelihood), being male (4.6% higher likelihood), not having a migration background (7.3% higher likelihood), and obtaining a VET position. Nevertheless, Model II revealed that the effects of Conscientiousness (2.7% higher likelihood) and Extraversion (1.7% higher likelihood) were even greater compared to Model I, and that they were incremental. The maximum difference between a student scoring at the lowest possible value of Conscientiousness (i.e., 1 on the 5-point scale) and the highest possible value (i.e., 5 on the 5-point scale) was  $(5-1) \times 2.7\% = 10.8\%$ , which is larger than that of all significant covariates. The maximum difference in the case of Extraversion was 6.8%, which was therefore larger than that of sex, but somewhat smaller than that of cognitive ability (9.6%) and migration background.

Figure 2.A1 in the Appendix illustrates that two Big Five personality traits interacted with different covariates. First, low Agreeableness was more detrimental for students with low cognitive ability, whereas it was helpful for students with high cognitive ability (0.8%; Model III). Second, Emotional Stability was more detrimental for students with low parental SES and more helpful for students with high parental SES (0.1%; Model IV).

### 2.5.2.2 Number of Offers of VET Positions

The second success indicator was the number of offers of VET positions within 1 year after graduation. Table 2.4 indicates that Conscientiousness was positively associated with the number of offers of VET positions ( $b = .109$ ), even when adjusted for the covariates ( $b = .129$ ), of which only sex was associated with the number of offers (with males obtaining more offers compared to females;  $b = -.215$ ). Personality alone explained 0.3% of the overall variance (Model I); personality and covariates together explained 0.5% of the overall variance (Model II). Even though the models are not statistically significant overall, it is noteworthy that the effect of Conscientiousness increased over Model I. Furthermore, after standardizing the variable, it became apparent that Conscientiousness ( $b_{\text{std}} = .516$ ) was even more predictive than sex.

**Table 2.3:** Average Marginal Effects for Obtaining a VET Position Within 1 Year After Graduation (Given the Submission of an Application) Regressed on the Big Five and the Covariates

	Model I			Model II			Model III			Model IV		
	AME	95% CI	p	AME	95% CI	p	AME	95% CI	p	AME	95% CI	p
Conscientiousness	<b>.017</b>	[.003, .031]	.018	<b>.027</b>	[.012, .041]	<.001	<b>.028</b>	[.014, .043]	<.001	<b>.028</b>	[.014, .042]	<.001
Emotional Stability	.008	[-.006, .022]	.256	-.001	[-.016, .013]	.862	-.001	[-.015, .014]	.933	.000	[-.014, .015]	.965
Openness	-.010	[-.023, .002]	.115	-.008	[-.021, .005]	.224	-.007	[-.020, .005]	.255	-.009	[-.022, .004]	.173
Extraversion	<b>.015</b>	[.001, .028]	.037	<b>.017</b>	[.004, .031]	.014	<b>.018</b>	[.004, .031]	.012	<b>.018</b>	[.004, .032]	.010
Agreeableness	-.007	[-.025, .011]	.460	-.004	[-.022, .014]	.633	-.008	[-.027, .010]	.368	-.005	[-.023, .013]	.605
Cognitive ability				<b>.008</b>	[.003, .012]	.001	<b>.008</b>	[.004, .013]	<.001	<b>.008</b>	[.003, .012]	.001
Parental SES				.001	[-.000, .001]	.051	<b>.001</b>	[.000, .001]	.044	<b>.001</b>	[.000, .002]	.012
Female				<b>-.046</b>	[-.070, -.021]	<.001	<b>-.047</b>	[-.071, -.023]	<.001	<b>-.048</b>	[-.072, -.023]	<.001
Migration background				<b>-.073</b>	[-.106, -.039]	<.001	<b>-.072</b>	[-.106, -.038]	<.001	<b>-.074</b>	[-.107, -.040]	<.001
Cognitive ability × C							.004	[-.001, .009]	.157			
Cognitive ability × ES							.002	[-.003, .007]	.406			
Cognitive ability × E							.004	[-.001, .009]	.161			
Cognitive ability × O							.001	[-.004, .006]	.680			
Cognitive ability × A							<b>-.008</b>	[-.015, -.001]	.018			
Parental SES × C										.001	[-.000, .001]	.193
Parental SES × ES										<b>.001</b>	[.000, .002]	.003
Parental SES × O										.000	[-.001, .001]	.980
Parental SES × E										.000	[-.000, .001]	.321
Parental SES × A										-.001	[-.002, .000]	.152
Pseudo R <sup>2</sup>	<b>.006</b>		.008	<b>.028</b>		<.001	<b>.033</b>		<.001	<b>.034</b>		<.001

Note. N = 3,276. Model I = Big Five only; Model II = Big Five and covariates; Model III = Big Five, covariates, and interaction terms between the Big Five and cognitive ability; Model IV = Big Five, covariates, and interaction terms between the Big Five and parental SES. VET = vocational education and training, AME = average marginal effect, CI = confidence interval, C = Conscientiousness, E = Emotional Stability, O = Openness, A = Extraversion, A = Agreeableness, SES = socioeconomic status. Coefficients and R<sup>2</sup> significant at the  $p < .05$  level are in bold type.

**Table 2.4:** Unstandardized Regression Coefficients for the Number of Offers of VET Positions Within 1 Year After Graduation Regressed on the Big Five and the Covariates

	Model I			Model II			Model III			Model IV		
	<i>b</i>	95% CI	<i>p</i>	<i>b</i>	95% CI	<i>p</i>	<i>b</i>	95% CI	<i>p</i>	<i>b</i>	95% CI	<i>p</i>
Conscientiousness	<b>.109</b>	[.002, .217]	.047	<b>.129</b>	[.019, .239]	.022	<b>.127</b>	[.017, .237]	.024	<b>.130</b>	[.020, .240]	.021
Emotional Stability	.052	[-.057, .162]	.350	.022	[-.091, .135]	.705	.020	[-.093, .133]	.724	.020	[-.094, .133]	.735
Openness	-.012	[-.111, .086]	.805	.006	[-.095, .106]	.913	.010	[-.091, .111]	.844	.002	[-.098, .103]	.962
Extraversion	.045	[-.060, .151]	.401	.055	[-.052, .161]	.314	.049	[-.058, .155]	.372	.054	[-.053, .160]	.321
Agreeableness	.058	[-.081, .197]	.413	.072	[-.068, .212]	.311	.068	[-.071, .208]	.338	.067	[-.073, .206]	.351
Cognitive ability				.001	[-.034, .037]	.950	.001	[-.034, .037]	.936	.001	[-.034, .037]	.948
Parental SES				.000	[-.005, .005]	.911	.000	[-.005, .006]	.863	.000	[-.005, .005]	.885
Female				<b>-.215</b>	[-.408, -.022]	.029	<b>-.220</b>	[-.413, -.027]	.026	<b>-.210</b>	[-.403, -.017]	.033
Migration background				-.043	[-.375, .289]	.799	-.038	[-.370, .294]	.822	-.040	[-.372, .292]	.815
Cognitive ability × C							.020	[-.023, .063]	.364			
Cognitive ability × ES							.001	[-.042, .044]	.955			
Cognitive ability × E							.013	[-.028, .055]	.530			
Cognitive ability × O							-.033	[-.072, .006]	.098			
Cognitive ability × A							<b>-.056</b>	[-.112, -.001]	.048			
Parental SES × C										<b>-.006</b>	[-.012, -.000]	.049
Parental SES × ES										-.002	[-.008, .004]	.472
Parental SES × O										<b>.006</b>	[.000, .011]	.037
Parental SES × E										.004	[-.002, .010]	.208
Parental SES × A										.001	[-.007, .009]	.807
<i>R</i> <sup>2</sup>	.003		.162	.005		.169	.008		.089	.009		.073

*Note.* *N* = 2,606. Model I = Big Five only; Model II = Big Five and covariates; Model III = Big Five, covariates, and interaction terms between the Big Five and cognitive ability; Model IV = Big Five, covariates, and interaction terms between the Big Five and parental SES. VET = vocational education and training, AME = average marginal effect, CI = confidence interval, C = Conscientiousness, ES = Emotional Stability, O = Openness, E = Extraversion, A = Agreeableness, SES = socioeconomic status. Coefficients and *R*<sup>2</sup> significant at the *p* < .05 level are in bold type.

As can be seen from Figure 2.A2 in the Appendix, Agreeableness compensated for low cognitive ability ( $b = -.056$ ; Model III). In addition, high Conscientiousness ( $b = -.006$ ) and low Openness ( $b = .006$ ) led to a higher number of offers of VET positions when parental SES was low (Model IV).

### 2.5.2.3 Starting a VET Position

The third success indicator was starting a VET position within 1 year after graduation (given the receipt of an offer of a VET position). As can be seen in Table 2.5, high Conscientiousness was associated with a 2.2% higher likelihood of starting a VET position; high Emotional Stability was associated with a 2.6% higher likelihood; and low Agreeableness was associated with a 2.8% higher likelihood (Model I). Personality traits explained 0.4% of the overall variance (*Pseudo R*<sup>2</sup>; Model I). Incorporating personality traits and covariates jointly into the model (Model II), we found that the pattern of significant predictors changed. The positive effect of Conscientiousness increased (3.2% higher likelihood) and was incremental; the relationship with Emotional Stability and Agreeableness disappeared. In total, Model II explained 1.5% of the overall variance (*Pseudo R*<sup>2</sup>). Furthermore, there was a positive association between cognitive ability (0.8% higher likelihood), parental SES (0.1% higher likelihood), and not having a migration background (13.4% higher likelihood) and starting a VET position. After standardizing the variables, Model II indicated that Conscientiousness—with a 12.8% higher likelihood—had a larger effect on starting a VET position than three of the four established predictors. Only migration background still had slightly more predictive power (cognitive ability: 9.6%; SES: 7.7%). Figure 2.A3 in the Appendix demonstrates that both Emotional Stability (0.1%) and Introversion (0.2%) compensated for low parental SES (Model IV) in the prediction of starting a VET position.

### 2.5.2.4 Dropout Intentions

The fourth success indicator was (the absence of) dropout intentions. As can be seen in Table 2.6, this outcome variable was positively related to Openness (1.1%). However, the model was not significant, with an overall explained variance of 0.9% (*Pseudo R*<sup>2</sup>; Model I). Considering both personality traits and covariates simultaneously in Model II, we found that the positive association with Openness vanished. In total, Model II explained 2.9% of the overall variance (*Pseudo R*<sup>2</sup>). In addition, being female (2.9% higher likelihood) and having a migration background (4.2% higher likelihood) were positively associated with the intentions of dropping out of VET.

**Table 2.5:** Average Marginal Effects for Starting a VET Position Within 1 Year After Graduation (Given the Receipt of an Offer of a VET Position) Regressed on the Big Five and the Covariates

	Model I			Model II			Model III			Model IV		
	AME	95% CI	p	AME	95% CI	p	AME	95% CI	p	AME	95% CI	p
Conscientiousness	<b>.022</b>	[.002, .042]	.034	<b>.032</b>	[.011, .052]	.002	<b>.032</b>	[.012, .053]	.002	<b>.032</b>	[.011, .052]	.002
Emotional Stability	<b>.026</b>	[.005, .047]	.014	.017	[-.005, .038]	.124	.017	[-.004, .038]	.122	.016	[-.005, .038]	.132
Openness	-.004	[-.022, .015]	.696	-.002	[-.021, .017]	.841	-.002	[-.020, .017]	.858	-.002	[-.021, .016]	.794
Extraversion	-.017	[-.037, .004]	.107	-.015	[-.036, .005]	.133	-.015	[-.035, .005]	.137	-.015	[-.035, .005]	.136
Agreeableness	<b>-.028</b>	[-.055, -.002]	.036	-.025	[-.052, .001]	.060	-.025	[-.051, .001]	.064	-.025	[-.051, .001]	.065
Cognitive ability				<b>.008</b>	[.001, .015]	.020	<b>.008</b>	[.001, .015]	.020	<b>.008</b>	[.002, .015]	.016
Parental SES				<b>.001</b>	[.000, .002]	.042	<b>.001</b>	[.000, .002]	.020	<b>.001</b>	[.000, .002]	.049
Female				-.034	[-.070, .002]	.067	-.034	[-.070, .002]	.062	-.031	[-.067, .004]	.086
Migration background				<b>-.134</b>	[-.192, -.077]	<.001	<b>-.134</b>	[-.191, -.076]	<.001	<b>-.130</b>	[-.188, -.073]	<.001
Cognitive ability × C							.002	[-.006, .010]	.630			
Cognitive ability × ES							.004	[-.004, .012]	.335			
Cognitive ability × E							-.001	[-.009, .007]	.859			
Cognitive ability × O							.003	[-.005, .010]	.486			
Cognitive ability × A							-.000	[-.011, .010]	.949			
Parental SES × C										.000	[-.001, .001]	.603
Parental SES × ES										<b>-.001</b>	[-.002, -.000]	.036
Parental SES × O										.000	[-.001, .001]	.490
Parental SES × E										<b>.002</b>	[.000, .003]	.002
Parental SES × A										.001	[-.000, .002]	.159
Pseudo R <sup>2</sup>	<b>.004</b>		.016	<b>.015</b>		<.001	<b>.016</b>		<.001	<b>.019</b>		<.001

Note. N = 2,846. Model I = Big Five only; Model II = Big Five and covariates; Model III = Big Five, covariates, and interaction terms between the Big Five and cognitive ability; Model IV = Big Five, covariates, and interaction terms between the Big Five and parental SES. VET = vocational education and training, AME = average marginal effect, CI = confidence interval, C = Conscientiousness, ES = Emotional Stability, O = Openness, E = Extraversion, A = Agreeableness, SES = socioeconomic status. Coefficients and R<sup>2</sup> significant at the  $p < .05$  level are in bold type.



**Table 2.6:** Average Marginal Effects for Dropout Intentions Regressed on the Big Five and the Covariates

	Model I			Model II			Model III			Model IV		
	AME	95% CI	p	AME	95% CI	p	AME	95% CI	p	AME	95% CI	p
Conscientiousness	-.006	[-.018, .006]	.308	-.009	[-.021, .003]	.127	-.009	[-.021, .003]	.135	-.009	[-.021, .002]	.119
Emotional Stability	.005	[-.007, .017]	.427	.010	[-.003, .022]	.134	.010	[-.002, .023]	.108	.009	[-.004, .021]	.176
Openness	<b>.011</b>	[.000, .022]	.041	.008	[-.003, .019]	.145	.007	[-.004, .018]	.222	.007	[-.004, .018]	.219
Extraversion	.003	[-.009, .014]	.622	.002	[-.010, .013]	.772	.002	[-.010, .013]	.737	.002	[-.009, .014]	.706
Agreeableness	-.005	[-.020, .010]	.503	-.008	[-.022, .007]	.323	-.007	[-.022, .008]	.333	-.008	[-.023, .007]	.308
Cognitive ability				.000	[-.004, .004]	.985	-.000	[-.004, .004]	.987	.000	[-.004, .004]	.926
Parental SES				.000	[-.004, .001]	.875	.000	[-.001, .001]	.871	-.000	[-.001, .000]	.759
Female				<b>.029</b>	[.009, .050]	.006	<b>.029</b>	[.009, .050]	.006	<b>.030</b>	[.009, .050]	.005
Migration background				<b>.042</b>	[.011, .072]	.008	<b>.043</b>	[.012, .074]	.006	<b>.041</b>	[.011, .072]	.009
Cognitive ability × C							-.000	[-.005, .004]	.926			
Cognitive ability × ES							-.002	[-.007, .002]	.339			
Cognitive ability × E							.001	[-.004, .005]	.792			
Cognitive ability × O							<b>.005</b>	[.001, .009]	.023			
Cognitive ability × A							.001	[-.005, .007]	.761			
Parental SES × C										.000	[-.000, .001]	.376
Parental SES × ES										.000	[-.001, .001]	.751
Parental SES × O										<b>.001</b>	[.000, .001]	.013
Parental SES × E										.000	[-.001, .001]	.941
Parental SES × A										.000	[-.001, .001]	.727
Pseudo R <sup>2</sup>	.009		.237	<b>.029</b>		.010	<b>.037</b>		.014	<b>.040</b>		.007

Note.  $N = 1,933$ . Model I = Big Five only; Model II = Big Five and covariates; Model III = Big Five, covariates, and interaction terms between the Big Five and cognitive ability; Model IV = Big Five, covariates, and interaction terms between the Big Five and parental SES. VET = vocational education and training, AME = average marginal effect, CI = confidence interval, C = Conscientiousness, ES = Emotional Stability, O = Openness, E = Extraversion, A = Agreeableness, SES = socioeconomic status. Coefficients and  $R^2$  significant at the  $p < .05$  level are in bold type.

From Figure 2.A4 in the Appendix it is apparent that Openness, as a positive resource to avoid forming the intentions to drop out, was more beneficial for students with low cognitive ability (0.5%; Model III) and low parental SES (0.1%) and more detrimental for students with high cognitive ability and high parental SES (Model IV).

#### 2.5.2.5 Actual Dropout

The fifth success indicator was (the absence of) actual dropout from VET. As Table 2.7 indicates, personality alone explained 1.0% of the overall variance (*Pseudo R*<sup>2</sup>; Model I), with high Conscientiousness related to a 2.2% higher likelihood of not dropping out of VET, and low Agreeableness related to a 2.8% higher likelihood. Although Model II did not substantially change the relationships, it increased the overall explained variance to 1.9% (*Pseudo R*<sup>2</sup>). Moreover, Model II indicated that the observed association with high Conscientiousness (2.5% higher likelihood of not dropping out) was slightly higher than in Model I, and that it was incremental. The link with low Agreeableness (2.7% higher likelihood of not dropping out) remained almost the same. In addition, Model II revealed that high cognitive ability (0.7% higher likelihood) and not having a migration background (5.9% higher likelihood) were also related to not dropping out, but—after standardizing the variables—to a lesser extent than Conscientiousness (10.0%) and Agreeableness (−10.8%; cognitive ability: 8.4%). Figure 2.A5 in the Appendix represents the same pattern as before—namely, that Openness was more detrimental for students with high parental SES, but that it compensated for low parental SES (0.1%; Model IV).

#### 2.5.2.6 Final VET Grade

The sixth success indicator was the final VET grade. Table 2.8 indicates that personality alone explained 2.6% of the overall variance (Model I), with high Openness ( $b = .065$ ) and high Extraversion ( $b = .068$ ) associated with a better final VET grade. Adding the covariates in Model II increased the overall explained variance to 5.0%. In addition, the pattern showed some changes. The positive effect of Extraversion increased ( $b = .073$ ) and was incremental; the positive effect of Openness vanished; and a positive effect of Conscientiousness emerged ( $b = .058$ ). With regard to the covariates, Model II showed only an association with high cognitive ability ( $b = .035$ ). After standardizing the independent variables, this association ( $b_{\text{std}} = .420$ ) was somewhat larger than for Conscientiousness ( $b_{\text{std}} = .232$ ) and Extraversion ( $b_{\text{std}} = .292$ ). There were no interactive effects.

**Table 2.7:** Average Marginal Effects for Actual Dropout Regressed on the Big Five and the Covariates

	Model I			Model II			Model III			Model IV		
	AME	95% CI	p	AME	95% CI	p	AME	95% CI	p	AME	95% CI	p
Conscientiousness	<b>-.022</b>	[-.039, -.004]	.014	<b>-.025</b>	[-.043, -.008]	.004	<b>-.024</b>	[-.042, -.007]	.006	<b>-.027</b>	[-.044, -.009]	.003
Emotional Stability	-.002	[-.019, .016]	.855	.001	[-.017, .019]	.908	.001	[-.018, .019]	.951	.001	[-.017, .019]	.932
Openness	.012	[-.004, .027]	.143	.012	[-.004, .027]	.147	.011	[-.004, .027]	.159	.009	[-.007, .025]	.253
Extraversion	.014	[-.002, .031]	.095	.013	[-.004, .030]	.132	.014	[-.003, .031]	.117	.013	[-.004, .030]	.140
Agreeableness	<b>.028</b>	[.005, .051]	.016	<b>.027</b>	[.004, .049]	.020	<b>.027</b>	[.004, .050]	.019	<b>.029</b>	[.007, .052]	.011
Cognitive ability				<b>-.007</b>	[-.013, -.001]	.009	<b>-.007</b>	[-.012, -.001]	.016	<b>-.007</b>	[-.012, -.002]	.011
Parental SES				.000	[-.001, .001]	.764	.000	[-.001, .001]	.682	.000	[-.001, .001]	.912
Female				.004	[-.026, .035]	.776	.004	[-.026, .035]	.774	.005	[-.025, .036]	.741
Migration background				<b>.059</b>	[.010, .109]	.019	<b>.060</b>	[.011, .110]	.017	<b>.058</b>	[.008, .107]	.023
Cognitive ability × C				.005	[-.002, .011]	.164						
Cognitive ability × ES				-.004	[-.011, .003]	.230						
Cognitive ability × E				.003	[-.003, .010]	.300						
Cognitive ability × O				.001	[-.005, .007]	.779						
Cognitive ability × A				-.002	[-.011, .006]	.600						
Parental SES × C										.000	[-.001, .001]	.393
Parental SES × ES										.000	[-.001, .001]	.817
Parental SES × O										<b>.001</b>	[.000, .002]	.011
Parental SES × E										.000	[-.001, .001]	.522
Parental SES × A										-.001	[-.002, .000]	.162
Pseudo R <sup>2</sup>	<b>.010</b>		.013	<b>.019</b>		.001	<b>.022</b>		.004	<b>.026</b>		.001

*Note.* N = 1,984. Model I = Big Five only; Model II = Big Five and covariates; Model III = Big Five, covariates, and interaction terms between the Big Five and cognitive ability; Model IV = Big Five, covariates, and interaction terms between the Big Five and parental SES. VET = vocational education and training, AME = average marginal effect, CI = confidence interval, C = Conscientiousness, ES = Emotional Stability, O = Openness, E = Extraversion, A = Agreeableness, SES = socioeconomic status. Coefficients and R<sup>2</sup> significant at the  $p < .05$  level are in bold type.

**Table 2.8:** *Unstandardized Regression Coefficients for Final VET Grade Regressed on the Big Five and the Covariates*

	Model I			Model II			Model III			Model IV		
	<i>b</i>	95% CI	<i>p</i>	<i>b</i>	95% CI	<i>p</i>	<i>b</i>	95% CI	<i>p</i>	<i>b</i>	95% CI	<i>p</i>
Conscientiousness	.044	[-.011, .100]	.116	<b>.058</b>	[.002, .114]	.041	<b>.058</b>	[.002, .114]	.042	<b>.060</b>	[.003, .116]	.038
Emotional Stability	.038	[-.018, .093]	.183	.031	[-.026, .088]	.287	.032	[-.025, .089]	.267	.030	[-.027, .087]	.305
Openness	<b>.065</b>	[.017, .113]	.008	.048	[-.001, .097]	.055	.045	[-.004, .094]	.073	.047	[-.002, .096]	.062
Extraversion	<b>.068</b>	[.016, .119]	.011	<b>.073</b>	[.021, .125]	.006	<b>.075</b>	[.023, .127]	.005	<b>.072</b>	[.020, .124]	.007
Agreeableness	-.041	[-.112, .030]	.256	-.045	[-.116, .025]	.209	-.047	[-.118, .024]	.196	-.048	[-.119, .023]	.185
Cognitive ability				<b>.035</b>	[.018, .053]	<.001	<b>.035</b>	[.017, .053]	<.001	<b>.035</b>	[.017, .052]	<.001
Parental SES				.002	[-.001, .005]	.121	.002	[-.000, .005]	.114	.002	[-.001, .005]	.127
Female				.026	[-.069, .122]	.588	.029	[-.066, .125]	.546	.027	[-.069, .122]	.583
Migration background				-.061	[-.252, .130]	.533	-.051	[-.243, .141]	.602	-.066	[-.258, .126]	.499
Cognitive ability × C							-.001	[-.023, .020]	.926			
Cognitive ability × ES							-.006	[-.027, .014]	.540			
Cognitive ability × E							-.009	[-.028, .010]	.371			
Cognitive ability × O							.014	[-.004, .032]	.115			
Cognitive ability × A							-.011	[-.040, .019]	.475			
Parental SES × C										-.001	[-.004, .002]	.500
Parental SES × ES										.000	[-.003, .004]	.914
Parental SES × O										.002	[-.001, .005]	.150
Parental SES × E										.001	[-.002, .004]	.601
Parental SES × A										.002	[-.002, .007]	.272
<i>R</i> <sup>2</sup>	<b>.026</b>		.001	<b>.050</b>		<.001	<b>.055</b>		<.001	<b>.055</b>		<.001

*Note.* *N* = 813. Model I = Big Five only; Model II = Big Five and covariates; Model III = Big Five, covariates, and interaction terms between the Big Five and cognitive ability; Model IV = Big Five, covariates, and interaction terms between the Big Five and parental SES. VET = vocational education and training, CI = confidence interval, C = Conscientiousness, ES = Emotional Stability, O = Openness, E = Extraversion, A = Agreeableness, SES = socioeconomic status. Coefficients and *R*<sup>2</sup> significant at the *p* < .05 level are in bold type.

**Table 2.9:** Unstandardized Regression Coefficients for Satisfaction With VET After 1 Year in a VET Position Regressed on the Big Five and the Covariates

	Model I			Model II			Model III			Model IV		
	<i>b</i>	95% CI	<i>p</i>	<i>b</i>	95% CI	<i>p</i>	<i>b</i>	95% CI	<i>p</i>	<i>b</i>	95% CI	<i>p</i>
Conscientiousness	<b>.129</b>	[.038, .221]	.006	<b>.152</b>	[.060, .245]	.001	<b>.154</b>	[.061, .246]	.001	<b>.155</b>	[.061, .248]	.001
Emotional Stability	<b>.107</b>	[.014, .201]	.024	.076	[-.020, .172]	.122	.078	[-.018, .174]	.110	.077	[-.020, .173]	.119
Openness	-.080	[-.163, .002]	.056	-.066	[-.150, .018]	.123	-.073	[-.157, .011]	.090	-.063	[-.148, .021]	.142
Extraversion	-.014	[-.103, .076]	.761	-.004	[-.094, .086]	.937	-.016	[-.106, .075]	.732	-.002	[-.092, .088]	.964
Agreeableness	.046	[-.074, .165]	.455	.061	[-.058, .181]	.315	.070	[-.050, .190]	.250	.058	[-.063, .179]	.348
Cognitive ability				.017	[-.013, .048]	.255	.019	[-.011, .049]	.211	.018	[-.012, .048]	.248
Parental SES				-.000	[-.005, .004]	.832	-.000	[-.005, .004]	.914	-.001	[-.005, .004]	.797
Female				<b>-.181</b>	[-.345, -.017]	.031	<b>-.174</b>	[-.338, -.010]	.037	<b>-.180</b>	[-.344, -.015]	.032
Migration background				-.316	[-.676, .043]	.084	-.298	[-.657, .060]	.103	-.319	[-.679, .041]	.082
Cognitive ability × C				.014	[-.022, .050]	.450						
Cognitive ability × ES				-.013	[-.049, .023]	.466						
Cognitive ability × E				.031	[-.003, .066]	.075						
Cognitive ability × O				.019	[-.013, .051]	.251						
Cognitive ability × A				<b>-.068</b>	[-.116, -.020]	.005						
Parental SES × C										-.000	[-.005, .005]	.951
Parental SES × ES										-.000	[-.006, .005]	.916
Parental SES × O										-.003	[-.008, .002]	.237
Parental SES × E										-.001	[-.006, .004]	.673
Parental SES × A										.002	[-.004, .009]	.498
<i>R</i> <sup>2</sup>	<b>.011</b>		.004	<b>.018</b>		.001	<b>.026</b>		<.001	<b>.019</b>		.011

*Note.* *N* = 1,528. Model I = Big Five only; Model II = Big Five and covariates; Model III = Big Five, covariates, and interaction terms between the Big Five and cognitive ability; Model IV = Big Five, covariates, and interaction terms between the Big Five and parental SES. VET = vocational education and training, CI = confidence interval, C = Conscientiousness, ES = Emotional Stability, O = Openness, E = Extraversion, A = Agreeableness, SES = socioeconomic status. Coefficients and *R*<sup>2</sup> significant at the *p* < .05 level are in bold type.

### 2.5.2.7 Satisfaction With VET

The seventh success indicator was satisfaction with VET after 1 year in a VET position. As can be seen from Table 2.9, a high score on both Conscientiousness ( $b = .129$ ) and Emotional Stability ( $b = .107$ ) was associated with the likelihood of being satisfied with VET. Personality traits explained 1.1% of the overall variance (Model I). Taking all predictor variables jointly into account, Model II, which explained 1.8% of the overall variance, revealed that the positive association with Conscientiousness increased and was incremental ( $b = .152$ ). Furthermore, the positive effect of Emotional Stability disappeared, and there was also a positive effect of being male ( $b = -.181$ ). After the variables were standardized, Conscientiousness ( $b_{\text{std}} = .608$ ) showed an even larger effect than sex. Figure 2.A6 in the Appendix illustrates that Agreeableness compensated for low cognitive ability ( $b = -.068$ ; Model III).

## 2.6 Discussion

The objective of the present study was to examine whether personality contributes to success in the transition from school to VET in Germany. For this purpose, we investigated whether the Big Five personality traits had incremental associations with transition success above and beyond sociodemographic characteristics (parental SES, sex, and migration background) and cognitive ability. We defined seven indicators of transition success: obtaining a VET position, number of offers of VET positions, starting a VET position, (absence of) dropout intentions, (absence of) actual dropout, final VET grade, and satisfaction with VET. Moreover, we explored possible interactions of the Big Five traits with parental SES and cognitive ability.

### 2.6.1 Additive Effects

Our findings suggest that several of the Big Five personality traits incrementally predicted at least one of the indicators of transition success over and above sociodemographic characteristics and cognitive ability. Among the Big Five, Conscientiousness had the most consistent positive associations with transition success. Effect sizes were small—but often as large as, or larger than, those of some of the established predictors of transition success, namely, cognitive ability and parental SES. Conscientiousness showed the most robust (incremental) predictive power for six of the seven transition success indicators: obtaining a VET position, number of offers of VET positions, starting a VET position, actual dropout, final VET grade, and satisfaction with VET ( $-.025 \leq \text{AME} \leq -.053$ ;  $-.058 \leq b \leq -.152$ ). This is in line with a plethora of other studies that have identified Conscientiousness as the most robust and potent

predictor among the Big Five traits of educational achievement and attainment as well as career success (e.g., Bergold & Steinmayr, 2018; John et al., 1994; Lechner et al., 2017; Poropat, 2009; Spengler et al., 2013, 2016; Vedel & Poropat, 2017; Woods et al., 2013). In line with previous evidence showing links between Conscientiousness and better grades/GPA (Brandt et al., 2020; Diedrich et al., 2018; Libbrecht et al., 2014; Lievens et al., 2002; McAbee & Oswald, 2013; Poropat, 2009; Richardson et al., 2012; Spengler et al., 2013; Trapmann et al., 2007; Vedel, 2014; Wintre & Sugar, 2000) as well as satisfaction with life, work, and VET (Diedrich et al., 2018; Rammstedt et al., 2017; Roberts et al., 2003), we could support this association for almost all of our transition success indicators. A conceivable explanation is that, because of consistent performance effort during the entire vocational training period and a sense of duty and diligence, a conscientious person tends to achieve better grades, tends to be more satisfied with VET, and tends to be less likely to drop out. Furthermore, Conscientiousness manifests itself in the application behavior (in terms of the number and type of applications) and is a criterion in the selection process, thereby increasing the likelihood of obtaining a VET position and a higher number of offers.

The other Big Five traits had weaker and more inconsistent main effects. Extraversion ( $AME = .017$ ;  $b = .073$ ) and Agreeableness ( $AME = .027$ ) also contributed incrementally to the prediction of transition success, whereas Openness and Emotional Stability had no incremental effects on transition success. Specifically, Extraversion predicted the final VET grade. This is in line with Wintre and Sugar (2000), who found Extraversion to be a predictor of GPA at university. Extraversion was also related to a higher likelihood of obtaining a VET position (but see Rammstedt et al., 2017, who reported a negative relation between Extraversion and the highest level of education). More extraverted students may have an advantage in obtaining an offer of a VET position because they are more socially connected and have more of the relevant “weak ties” (Granovetter, 1977; i.e., acquaintances compared to close friends or family members) than more introverted students. In addition, Extraversion is likely to manifest itself in the form of assertiveness in the application procedure, emboldening students to submit a greater number of unsolicited applications and to approach potential employers to inquire about vacant apprenticeship positions.

Agreeableness predicted a higher likelihood of dropping out of VET, a transition success indicator that has not been investigated to date in previous research. Our finding is in line with Brandt et al. (2020) and Lechner et al. (2017), who found negative associations between high Agreeableness and school performance using the same NEPS data. However, other studies based on other (typically much longer Big Five inventories) have reported positive associ-

ations between high Agreeableness and related outcome variables—namely, educational attainment (Shanahan, Bauldry, et al., 2014), sales performance and performance growth (Thoresen et al., 2004), and GPA/grades (Poropat, 2009; Richardson et al., 2012; Vedel, 2014). A possible—albeit speculative—explanation for this divergence is that different facets of Agreeableness may relate differently to different success outcomes. The BFI-10+1 measure of Agreeableness focuses mainly on the trust and compliance facets of this construct, but may not fully capture other facets that might foster success. Future research using longer Agreeableness scales—ideally scales that allow for facet-level analyses—is needed to address this question.

Some effects of individual personality traits disappeared after controlling for sociodemographic characteristics and cognitive ability. This was the case mainly with Emotional Stability and Openness, the two personality traits that were found to have no additive effects on transition success. Without controlling for the covariates, high Emotional Stability was positively related to starting a VET position and satisfaction with VET, and high Openness was positively associated with the final VET grade and negatively associated with the intentions to drop out. Although the very limited role of Emotional Stability contradicts our expectations, it is in line with recent large-scale findings on the Big Five as predictors of educational achievement (Brandt et al., 2020; Lechner et al., 2017) and with Poropat's (2009) meta-analysis of personality–academic performance relationships based on the five-factor model. The prominent role of Openness in educational success suggested by this previous research was not borne out by our analyses with regard to transition to VET. A possible explanation for this is that Openness-related behaviors such as being intellectually curious or pursuing creative interests are simply not as relevant for the specific transition success outcomes that we investigated (e.g., number of offers of VET positions, dropout) than for more traditional indicators of academic success such as grades or test scores.

Among the covariates, migration background (as measured by the proxy of having German as a mother tongue) proved to be the most important predictor of transition success, showing significant relationships with four of the seven success indicators. However, only in two cases the effects of migration background were larger than that of the Big Five personality traits. Sex and cognitive ability also had significant associations with four of the seven success indicators, but to a lesser extent than migration background. The effect sizes of both sex and cognitive ability were smaller than those of the personality traits on three outcomes and larger on one outcome. Interestingly, parental SES was related to only one transition success indicator (starting a VET position), but with a smaller effect size than that of the significant



personality trait Conscientiousness. Conscientiousness was more consistently related to our indicators of transition success than the established predictors. In detail, Conscientiousness was related to six of the success indicators, that is, to two indicators more than migration background, sex, and cognitive ability, and to five indicators more than parental SES. Despite their individually small effect sizes, the joint contribution of the Big Five personality traits in the prediction of transition success emerged as more robust than parental SES, cognitive ability, sex, and migration background.

As a consequence of the mostly small effect sizes, the overall explained variance—although significant—was not very high for any of the seven success indicators. However, this is in line with several previous investigations on relationships between the Big Five and educational or career outcomes (e.g., Bergold & Steinmayr, 2018; Rammstedt et al., 2016). Possible explanations are that almost everyone who applied for a VET position got an offer, and that the generally small differences in the outcomes inevitably led to small variance.

### 2.6.2 Interactive Effects

In addition to these additive effects, we explored possible interactive effects in order to further understand how personality traits might contribute to transition success. Specifically, we explored whether personality traits moderate the association of cognitive ability and parental SES with transition success.

Our exploratory findings also offer tentative support for the idea that personality traits may moderate the effects of parental SES and cognitive ability on transition success (i.e., interactive effects). Even though we found few interactive effects overall, two major traits showed some systematic patterns of moderation effects: Openness and Agreeableness. Openness primarily moderated the associations of parental SES with several success indicators ( $AME = .001$ ;  $b = .006$ ), whereas Agreeableness moderated solely the associations of cognitive ability with various success indicators ( $AME = -.008$ ;  $-.068 \leq b \leq -.056$ ).

The interactive effects were mostly compensatory in nature, suggesting that personality traits can partly compensate for background disadvantages (e.g., Ayoub et al., 2018; Damian et al., 2015; Kaiser & Schneickert, 2016; Shanahan, Bauldry, et al., 2014), as resource substitution theory (Mirowsky & Ross, 2003) would predict. For example, high Agreeableness compensated for low cognitive ability (in predicting the number of offers of VET positions and satisfaction with VET), and high Openness compensated for low parental SES (in predicting the intentions not to drop out of VET and actually not dropping out of VET). The latter finding is in line with previous studies that found the same pattern, namely, compensatory

interactive effects between high Openness and low parental SES in predicting educational attainment and achievement (Ayoub et al., 2018; Kaiser & Schneickert, 2016; Shanahan, Bauldry, et al., 2014).

Other interactions appeared to be synergistic, rather than compensatory, in nature, thus resembling the Matthew effect (Damian et al., 2015), which means that personality traits relevant to success benefited especially those who were already advantaged in terms of cognitive ability or parental SES. For example, students with high cognitive ability benefited the most from low Agreeableness (in predicting obtaining a VET position) and students with high SES benefited the most from high Openness (in predicting the number of offers). The latter effect is in line with Kaiser and Schneickert (2016) who examined success in primary school.

### **2.6.3 Limitations and Directions for Future Research**

The present study is among the first to address the role of personality in predicting successful educational transitions. Despite the advances we made, several limitations should be noted. First, and most importantly, although we aimed to identify causal effects of the Big Five by including several control variables and ensuring a correct temporal ordering of predictors and outcomes, unobserved third variables may have led to spurious effects. Thus, although plausible, the associations we found cannot be interpreted as causal. Experimental or quasi-experimental designs could help to overcome this limitation.

Second, only a short scale with 11 items was available to measure the Big Five personality traits. Although the short scale BFI-10 (+1; Rammstedt and John, 2007) has a relatively high predictive validity compared to longer scales (e.g., Thalmayer et al., 2011), the effect sizes we found are likely to be conservative because the BFI-10+1's lower reliability compared to longer scales may attenuate effect sizes, and because, with two (or three) items per trait, the BFI-10+1 depicts each individual trait less broadly. However, the narrower operationalization may sometimes lead to higher associations with external criteria if only certain facets of each personality trait are covered that are more predictive than the dimension as a whole (Thalmayer et al., 2011). Research using longer scales—ideally scales that allow for facet-level analyses—could provide a more robust and fine-grained picture of how personality contributes to transition success.

Third, because NEPS only provides a short test of students' cognitive ability, the internal consistency of this test was relatively low in the present sample (Cronbach's  $\alpha = .66$ ). The limited reliability of the test means that, though we found significant associations between

cognitive ability and some of our success indicators, the importance of student's cognitive ability for transition success is likely to have been underestimated in the present study.

Fourth, we assumed the specific mechanisms of the Big Five traits (resource vs. selection criterion) only theoretically, and could not test them directly. Future studies are needed to reveal the mediators for the Big Five's effects on transition outcomes.

Fifth, all seven success indicators were self-reports. Therefore, the answers on these questions could be biased by common method bias and/or socially desirable responding.

Sixth, with the available dataset, it was only possible to analyze the transition of school leavers from *Hauptschule* (general secondary schools) and *Realschule* (intermediate secondary schools) in Germany applying for a VET position. Although we expect a similar pattern for *Gymnasium* (academically oriented secondary schools) graduates (*Abiturienten*) who apply for a VET position or for tertiary education, we cannot make generalizable predictions at this point in time. Thus, future research is needed to establish whether the present findings also apply to other educational transitions and to education systems in other national and institutional contexts.

Seventh, our tests of interactive effects were purely exploratory, we tested multiple outcome variables, and the effects did not appear consistent across all outcomes. Thus, these interactive effects should only be seen as a call for future research replicating these results and deeper investigating the causal mechanism of these effects.

## 2.7 Conclusion

The present study contributes to our understanding of educational transitions by identifying Big Five personality traits as a hitherto underappreciated source of individual differences in transition success as captured by a broad range of success indicators. Our results demonstrate that several of the Big Five traits incrementally predict the successful mastery of the transition from school to VET over and above cognitive ability, parental SES, sex, and migration background. Among the variables in the model (the Big Five and the covariates), Conscientiousness proved to be the most robust (incremental) predictor of almost all the success indicators. The other Big Five traits had several additive—albeit less pervasive—associations with transition success. In addition to these additive effects, we also found evidence that personality can moderate the effects of cognitive ability and parental SES on educational transitions, and that this interaction can be both compensatory and synergistic in nature. Future research

should replicate and extend these findings and generalize them to other educational transitions and education systems.

The individual effect sizes for each individual Big Five trait and success indicator were mostly small. At the same time, these effect sizes rivaled or even surpassed those of cognitive ability, parental SES, sex, and migration background. Note that these characteristics are traditionally considered to be important determinants of the success of educational transitions. Moreover, considering the combined effects of all Big Five traits on all seven success indicators, we submit that the role of personality in transition success is non-negligible and deserves greater attention in research on school-to-work transition.

Because personality traits are more malleable than sociodemographic characteristics, and hence more amenable to targeted interventions, our results also have potential practical applications. Conscientiousness and its behavioral manifestations (e.g., writing flawless VET applications and submitting them in time), for instance, could be a possible target for interventions to promote this particular personality trait and to provide specific training for those who are low in this trait, with the aim to obtain better coping strategies for educational transitions.

In sum, the findings gained from the present investigation might be of interest to educational research and policy alike. Future research could concentrate on replicating and expanding these findings. In our view, it would be particularly important to cast light on the possible mediating mechanisms linking personality to transition success. Doing so will help clarify the causes of unequal educational opportunities and make it possible to intervene purposefully.

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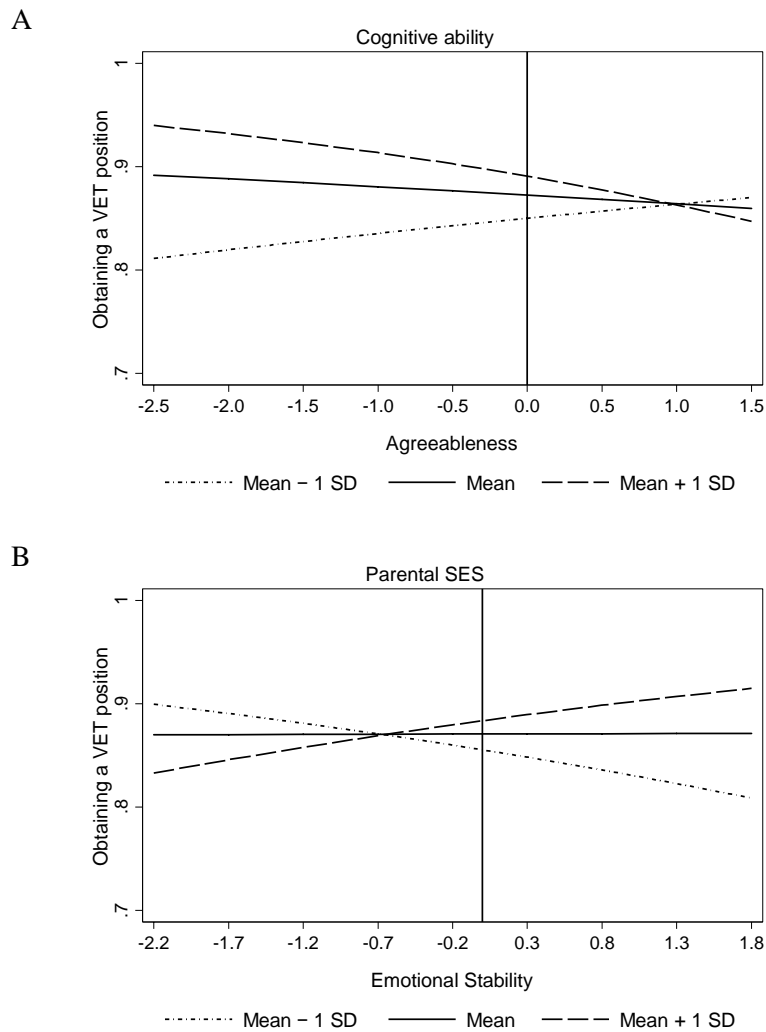
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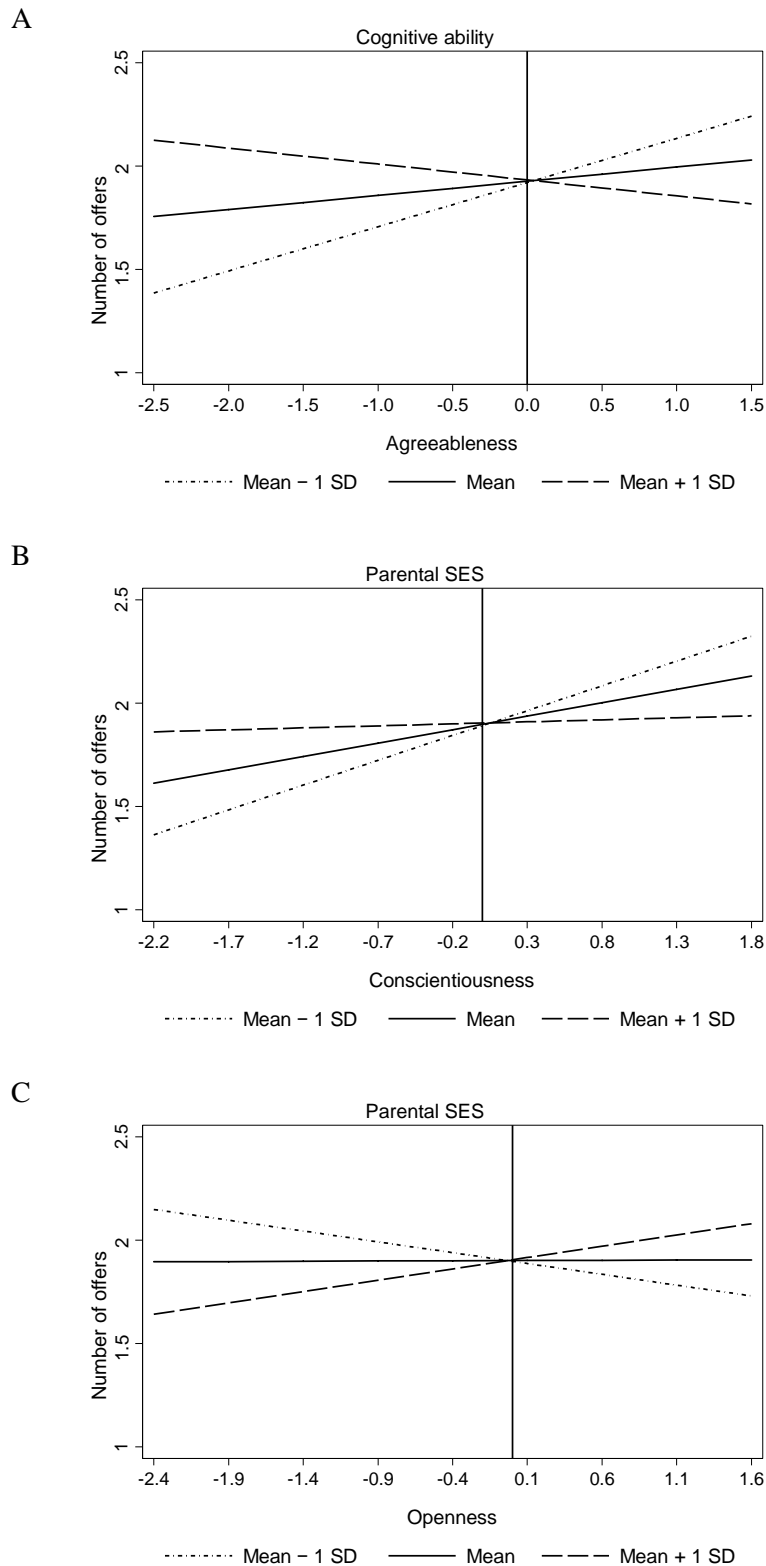
## 2.9 Appendix

**Figure 2.A1:** *Interactive Associations Between Different Big Five Personality Traits and Different Covariates for the Success Indicator “Obtaining a VET Position”*



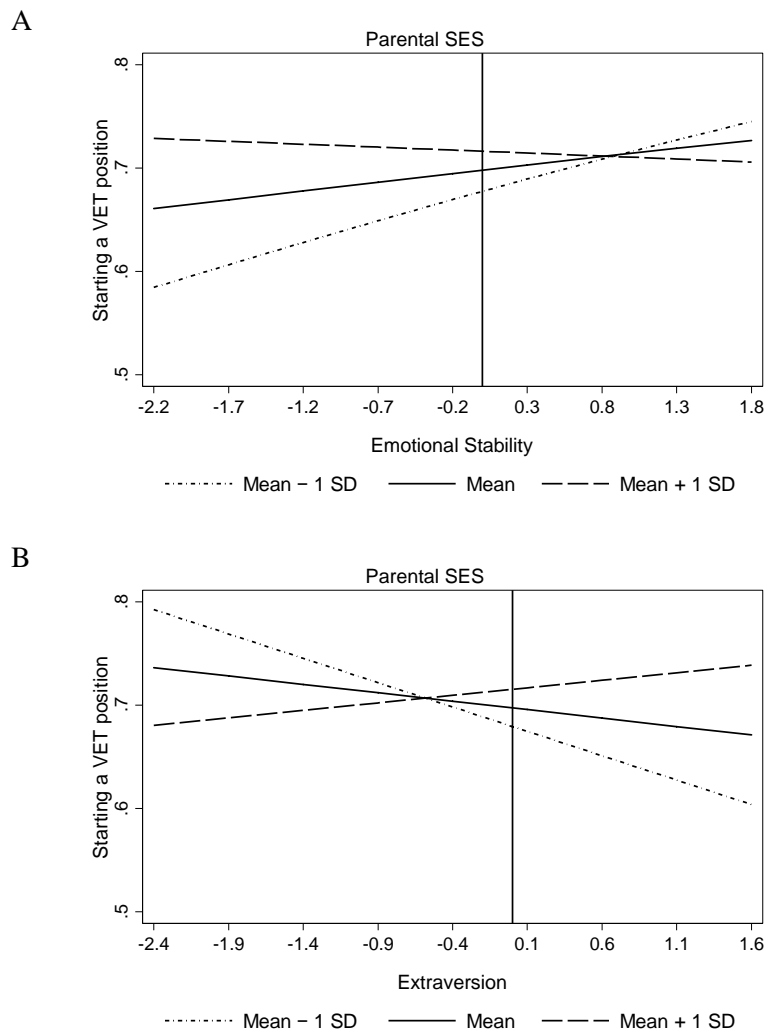
*Note.*  $N = 3,276$  (A–B). VET = vocational education and training, SES = socioeconomic status. The vertical line represents the mean value. All variables are centered. All interactions are significant.

**Figure 2.A2:** *Interactive Associations Between Different Big Five Personality Traits and Different Covariates for the Success Indicator “Number of Offers of VET Positions”*



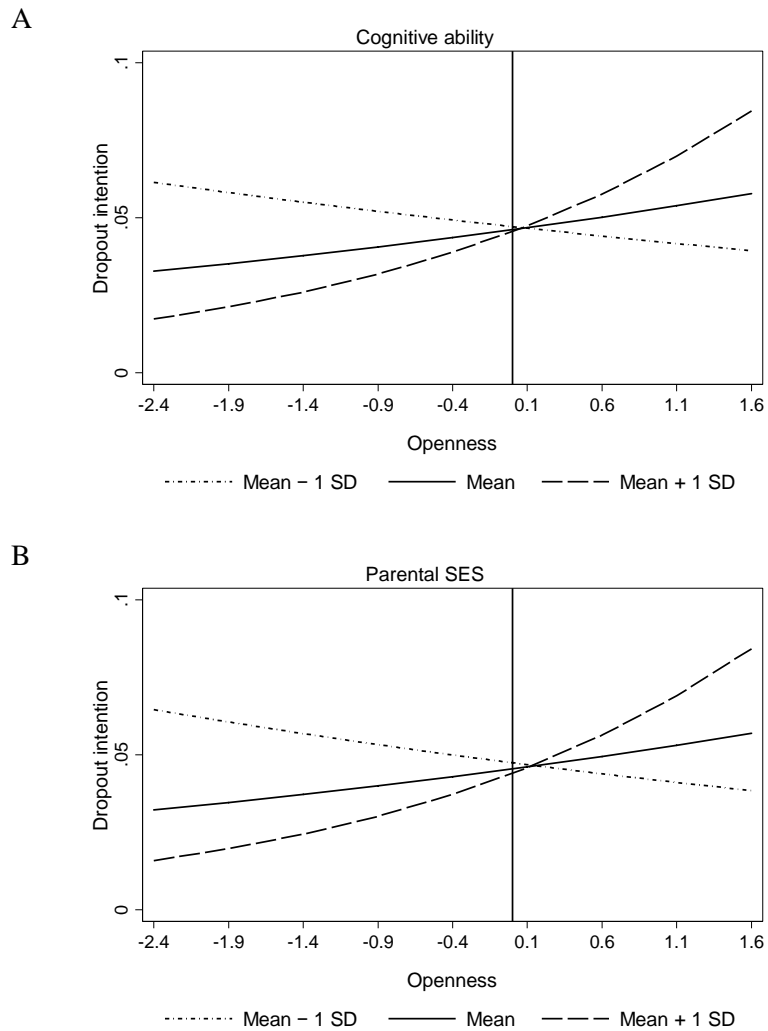
*Note.*  $N = 2,606$  (A–C). VET = vocational education and training, SES = socioeconomic status. The vertical line represents the mean value. All variables are centered. All interactions are significant.

**Figure 2.A3:** *Interactive Associations Between Different Big Five Personality Traits and Parental SES for the Success Indicator “Starting a VET Position”*



*Note.*  $N = 2,846$  (A–B). SES = socioeconomic status, VET = vocational education and training. The vertical line represents the mean value. All variables are centered. All interactions are significant.

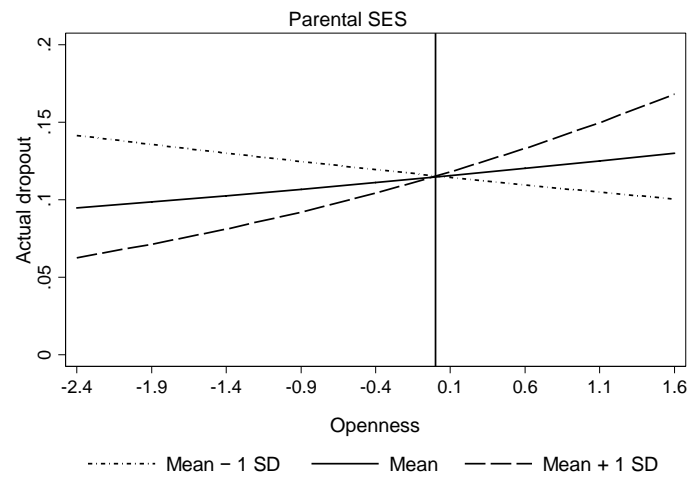
**Figure 2.A4:** *Interactive Associations Between the Big Five Personality Trait Openness and Different Covariates for the Success Indicator “Dropout Intention”*



*Note.*  $N = 1,933$  (A–B). SES = socioeconomic status. The vertical line represents the mean value. All variables are centered. All interactions are significant.

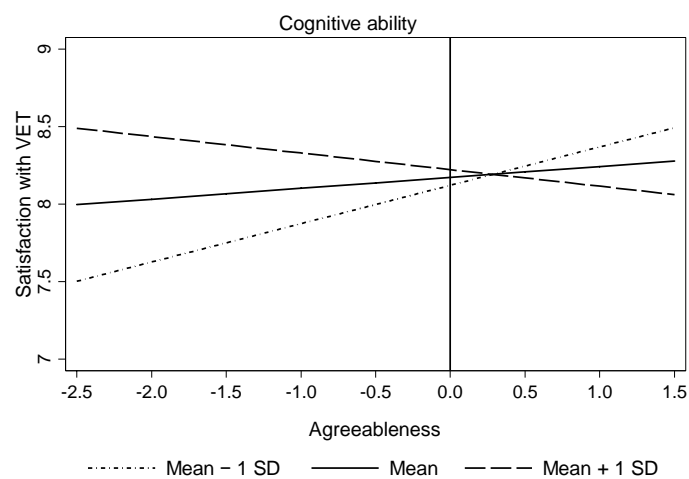


**Figure 2.A5:** *Interactive Associations Between the Big Five Personality Trait Openness and Parental SES for the Success Indicator “Actual Dropout”*



*Note.*  $N = 1,984$ . SES = socioeconomic status. The vertical line represents the mean value. All variables are centered. The interaction is significant.

**Figure 2.A6:** *Interactive Association Between the Big Five Personality Trait Agreeableness and Cognitive Ability for the Success Indicator “Satisfaction with VET”*



*Note.*  $N = 1,528$ . VET = vocational education and training. The vertical line represents the mean value. All variables are centered. The interaction is significant.



### **3 Study 2:**

## **“You Can’t Always Get What You Want”: Prevalence, Magnitude, and Predictors of the Aspiration–Attainment Gap After the School-to-Work Transition**

This study is currently under review:

Nießen, D., Wicht, A., Schoon, I., & Lechner, C. M. (2022). *“You can’t always get what you want”: Prevalence, magnitude, and predictors of the aspiration–attainment gap after the school-to-work transition* [Revised manuscript resubmitted for publication].  
GESIS – Leibniz Institute for the Social Sciences.



### 3.1 Abstract

This study examined the prevalence, magnitude, and predictors of the aspiration–attainment gap (AAG) after the school-to-work transition. We operationalized the AAG as the discrepancy between the socioeconomic status (SES) of young people’s realistic occupational aspirations and that of the position they actually attained. As a case in point, we investigated non-college-bound students transitioning into a vocational education and training (VET) position in Germany. Our aims were twofold: first, to establish how many students experience an AAG of what size; second, to identify characteristics that predict whether students experience an AAG. We considered sociostructural characteristics, cognitive ability and school grades, and Big Five personality traits as predictors (i.e., potential determinants) of the AAG. Analyses in a representative sample ( $N = 2,478$ ) of intermediate secondary school (*Realschule*) students/graduates from the German National Educational Panel Study (NEPS; Starting Cohort 4) revealed that 45.9% of students experienced an AAG. Two-part regression models showed that the level of aspirations was the strongest predictor of the experience and size of an AAG, followed by school grades. Aspirations also mediated the effects of several other predictors, most importantly parental SES and school grades. Parental SES, female gender, and Emotional Stability had contradictory effects: They indirectly increased the risk of experiencing an AAG by raising aspirations, but at the same time they lowered this risk by directly increasing attainment. Overall, our results suggest that the AAG during the transition from school to VET is a widespread experience among students in Germany that is worthy of further investigation.

## 3.2 Introduction

A successful school-to-work transition plays a pivotal role in shaping youths' subsequent occupational careers (e.g., Schoon & Heckhausen, 2019; Tomasik et al., 2009). However, especially in today's highly competitive education systems and labor markets, this transition is sometimes difficult. Some youth inevitably fall short of their own expectations and goals. These youth experience a gap between their aspirations and their actual attainment, or what some have termed an *aspiration–attainment gap* (AAG).

The term AAG is often used in the context of educational aspirations and attainment (e.g., Buttaro et al., 2010; Paat, 2015, 2016), although people can experience an AAG in any area of life, such as with regard to marriage, childbearing, or income. In the context of educational and school-to-work transitions, which is our focus in the present study, the AAG denotes a discrepancy between the occupational position to which students aspire versus the one they attain. Specifically, we conceived of the AAG as the difference between the socioeconomic status (SES) of the aspired occupation and the SES of the attained position, although other facets of the occupational AAG are conceivable (e.g., job stability, qualification level, income, etc.; see, e.g., Ahrens et al., 2021). SES is of particular interest because it reflects the social class and career prospects associated with an occupation and is therefore meaningful in terms of the further life course. Hence, the AAG is a potentially insightful concept that could complement other perspectives on successful school-to-work transitions.

As a case in point, we investigated the AAG among non-college bound youth who transitioned from secondary school to vocational education and training (VET) in Germany. Our aims were twofold: first, to establish how widespread the thus-conceived AAG is in this population (*prevalence* and *magnitude*); second, to identify characteristics that predict which students experience an AAG or not (*predictors*). In this regard, we considered a broad range of candidates that previous research has shown to predict aspirations, attainment, or both: sociostructural characteristics, cognitive ability and school achievement, and personality traits.

### 3.3 Theoretical Background

#### 3.3.1 Why the AAG Is an Important Characteristic of Successful School-to-Work Transitions

Research on school-to-work transition has traditionally focused on identifying predictors of *attainment*, more specifically, of successful transitions in terms of fast and smooth access to the labor market and the SES associated with the attained position (e.g., Blossfeld, 2017; Kleinert & Jacob, 2013; Schoon & Polek, 2011). Another line of research has identified precursors and consequences of *aspirations* during the school-to-work transition (e.g., Mello, 2008; Schoon & Eccles, 2014). By comparison, the degree to which youth are able to realize their aspirations or not—the AAG—has received little attention.

We propose a new perspective on school-to-work transitions and submit that focusing on the AAG may offer a valuable complement to the outcomes that research on school-to-work transition has traditionally investigated. First, the ability to realize one's aspirations can serve as an additional indicator of a successful transition. Different from attainment indicators that focus on normative, *objective* definitions of success (e.g., grades, level of education, obtaining a position, prestige, income, or retention; see, e.g., Damian et al., 2015; Nießen et al., 2020), the AAG reflects a more *subjective* definition of success that depends on the fit between individuals' aspirations and the position they attain.

Second, experiencing an AAG may have adverse consequences for a range of outcomes. From the perspective of discrepancy theories (e.g., Higgins, 1987; Michalos, 1985), level of aspiration theory (e.g., Starbuck, 1963), and person–environment (P–E) fit theories (e.g., Edwards & Shipp, 2007), gaps between aspirations and actual attainment may hamper motivation, performance, and well-being. In support of these theories, evidence suggests that experiencing an occupational AAG is linked to lower satisfaction with VET; lower life, job, and income satisfaction; a higher likelihood of dropping out of VET; and a lower propensity to consider oneself as very successful in one's working life (e.g., Beckmann et al., 2021; Carr, 1997; Hardie, 2014; Nießen et al., 2021). Low satisfaction, in turn, is related to a range of detrimental long-term career outcomes such as turnover, dropout, decreased work motivation, and decreased goal striving (e.g., Beckmann et al., 2021; Haase et al., 2012; Medici et al., 2020; Ton & Hansen, 2001).

Third, differences in the ability to realize one's aspirations may constitute an additional aspect of social inequality that is worthy of investigation. Experiencing an AAG may reflect

individual or group-specific disadvantages and structural barriers to realizing aspirations. Because the AAG is a joint function of aspirations and attainment (specifically, the difference between them), investigating the AAG as a characteristic of successful transition may reveal additional insights regarding social inequality in the school-to-work transition that are not evident in aspirations or attainment alone.

In sum, we argue that the AAG is a concept that is worthy of greater research attention, both in its own right and because of its potential adverse consequences. For these reasons, we believe that it is important to understand how many youths are able to realize their aspirations during the school-to-work transition; and how those that are able to realize their aspirations differ from those who are not. In other words, it is important to establish the *prevalence*, *magnitude*, and *predictors* of the AAG. However, so far, we know very little about the AAG after the school-to-work transition, let alone in relation to VET students in Germany.

### **3.3.2 Why Might Adolescents Experience an AAG After the School-to-Work Transition? Theoretical Perspectives**

There is no theory of school-to-work transitions or career development that focuses specifically on the AAG. However, there are several pertinent theoretical perspectives that can inform our current work on the AAG. These perspectives suggest considering main processes that might lead to the emergence of an AAG: individual self-selection processes and institutional selection processes (i.e., by vocational schools or employers).

*Individual self-selection processes* refer to students' resources and behaviors that (indirectly) influence the risk of experiencing an AAG through the goals (i.e., aspirations) they set for themselves and pursue. According to *social cognitive career theory* (SCCT; Lent et al., 2002) and Gottfredson's (2002) *theory of circumscription, compromise and self-creation* (CCS), occupational aspirations, a key component of the AAG, are the result of learning experiences, which are influenced by multiple factors, including social background (e.g., sex, social class, ethnicity), individual abilities and predispositions (i.e., heritable factors, such as cognitive ability, personality traits). Occupational aspirations are thought to mediate the influences of social background and individual-level abilities and predispositions on occupational attainment, the second part of the AAG (for detailed information on SCCT and CCS, see, e.g., Brown, 2002).

*Institutional selection processes* refer to characteristics and behaviors of students that influence employers' perceptions of their aptitude, and thus employers' decisions whether to



offer students a VET position. Economic theories, such as signaling theory (Spence, 1974), highlight “the signaling power of education” (Spence, 1973, p. 356). Educational certificates and grades act as market signals about applicants’ expected productivity (Spence, 1974) and trainability (Thurow, 1975). Similarly, other directly or indirectly visible individual characteristics (e.g., ethnicity, sex, abilities, and personality traits) can also be the subject of evaluation on the VET market, which influence whether individuals obtain the VET position for which they applied. For example, in addition to grades, basic personality traits, such as Conscientiousness or Extraversion, or sex are used in the selection process as potential information about the expected suitability of applicants (e.g., in terms of reliability, dealing with customers, gender-typical occupations; see, e.g., Caldwell & Burger, 1998; Charles, & Grusky, 2005; Nießen et al., 2020).

Together, these theories suggest that occupational attainment strongly depends on sociostructural characteristics, educational achievement, and predispositions. These factors can influence occupational attainment directly by fostering it, and indirectly through occupational aspirations. The next section provides an overview of pertinent evidence.

### **3.3.3 Previous Evidence on the Predictors of Aspirations and Attainment**

Although the interplay of aspirations and attainment has long been a central issue in the study of school-to-work transitions and career development (e.g., Schoon & Eccles, 2014), little previous research has addressed the occupational AAG as defined above. A handful of studies have investigated the educational AAG in the sense of the discrepancy between the highest aspired level of education and actual educational attainment (e.g., Buttaro et al., 2010; Paat, 2015, 2016). This research hails mainly from English-speaking countries and has focused on differences in attainment by ethnic background, and mostly on educational aspirations in selective samples (e.g., children of Mexican immigrants, Black students). Another strand of studies has examined the effect of educational attainment on educational aspirations (e.g., McCarron & Inkelas, 2006; McElvany et al., 2018) in selective samples (e.g., first-generation students, students with or without a Turkish migration background). Still other studies have investigated the relevance of educational/academic aspirations for educational/academic attainment (e.g., Kay et al., 2016; Schoon & Lyons-Amos, 2016).

Thus, as it stands, little is known about the (occupational) AAG and the characteristics that predict the AAG among youth at labor market entry. Even so, previous research on the predictors of and the link between aspirations and attainment can inform hypotheses about the predictors of the occupational AAG at entry to VET. As the AAG is the discrepancy between

aspirations and attainment, any characteristic associated with either variable must also be associated with the AAG.

### **3.3.3.1 The Link Between Aspirations and Attainment**

In line with the theories reviewed above, previous research has highlighted the role of occupational aspirations for occupational attainment (e.g., Ashby & Schoon, 2010; Mello, 2008; Schoon & Parsons, 2002) with the typical finding that higher aspirations predict higher attainment (e.g., Schoon & Lyons-Amos, 2016, 2017). For example, in a study of low-achieving school leavers in Germany, Holtmann et al. (2017) found that higher career aspirations led to stronger efforts to apply for a VET position—a crucial step in obtaining an apprenticeship. Young people with higher aspirations have also been found to attain higher social status and income (e.g., Rojewski, 2005; Schoon & Polek, 2011). Furthermore, in a sample of Black high school students in the USA, Buttaro et al. (2010) found that higher educational aspirations were related to lower educational AAGs, but most students were unable to achieve their eighth-grade educational aspirations 12 years later.

### **3.3.3.2 Sociostructural Characteristics as Predictors of Aspirations and Attainment**

Previous investigations have also revealed strong associations of family background and sex with young people's educational and occupational attainment (e.g., Becker & Schubert, 2011; Duncan & Brooks-Gunn, 1997; Klein et al., 2009). Young people from higher-SES families have been found to have higher aspirations (e.g., Schoon & Polek, 2011) and higher occupational attainment compared with their less socially privileged counterparts (e.g., Schoon, 2010). Young people in Germany with a migration background reported higher aspirations but had lower occupational attainment compared with native Germans (e.g., McElvany et al., 2018). This phenomenon has been referred to as the *immigrants' aspiration–achievement paradox* (e.g., Kao & Tienda, 1998; Salikutluk, 2013). Finally, females have been found to have higher aspirations than males (e.g., Schoon & Polek, 2011; Wicht et al., 2021).

### **3.3.3.3 Cognitive Ability and School Grades as Predictors of Aspirations and Attainment**

Cognitive ability and school grades are further key predictors of occupational attainment. Cognitive ability, which is not directly observable, is a measure of students' *potential* to perform in a job. It is positively associated with occupational aspirations (e.g., Schoon & Polek, 2011), and ranks among the strongest predictors of both educational and occupational attainment (e.g., Deary et al., 2007; Kuncel et al., 2004; Schoon, 2010). School grades, on the other

hand, represent a directly observable measure of *actual* achievement in the form of educational certificates. Higher school grades are associated with lower educational AAGs (Buttaro et al., 2010; Paat, 2015) and higher occupational attainment (e.g., Kay et al., 2016; Mello, 2008). Large-scale studies and meta-analyses have shown that grades and cognitive ability are only moderately correlated (e.g.,  $r = .32$ , Lechner et al., 2017;  $r = .44$ , Roth et al., 2015), indicating that they capture different information about young people's potential to attain desired occupational positions.

#### 3.3.3.4 Personality Traits as Predictors of Aspirations and Attainment

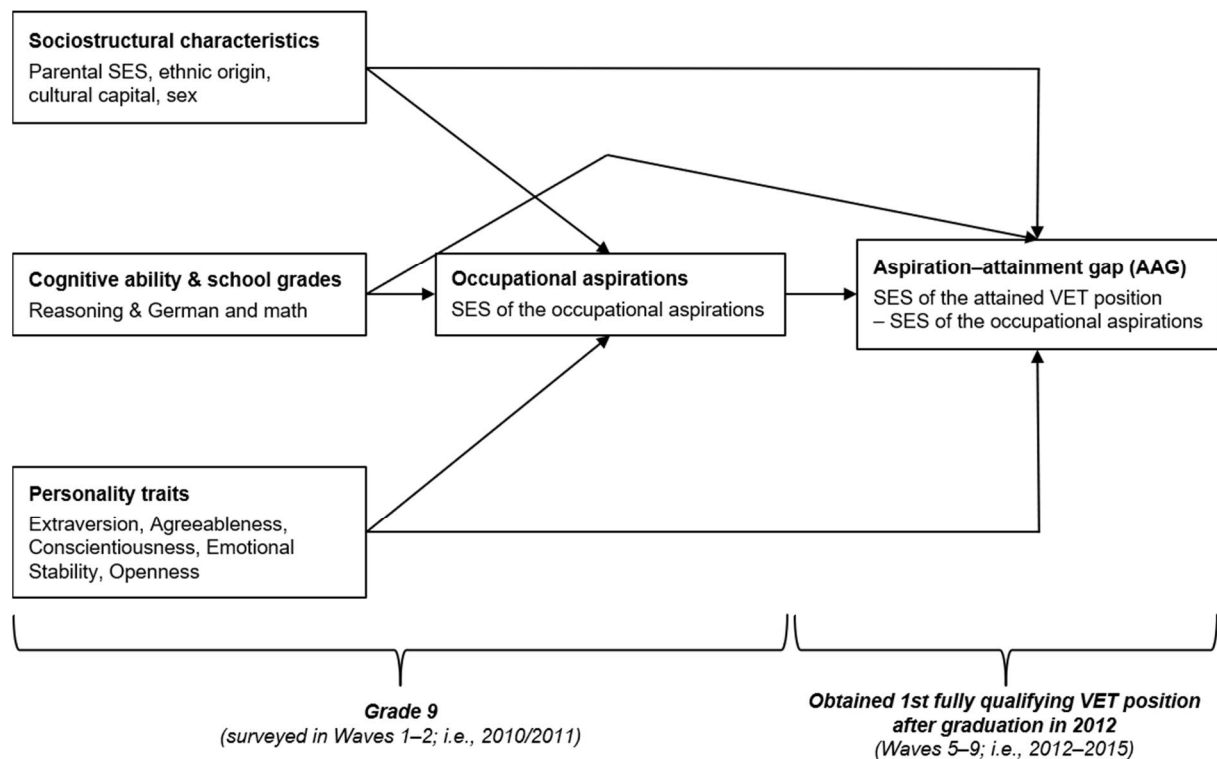
Personality traits, such as the Big Five (Costa & McCrae, 1992; Goldberg, 1992), feature prominently in classic theories of career choice (e.g., Holland, 1997). In particular, higher Openness has been shown to be involved in the formation of higher aspirations (e.g., Rottinghaus et al., 2002). Moreover, a growing body of evidence also demonstrates the predictive power of the Big Five for educational and occupational attainment (for a recent review, see Lechner et al., 2019). For example, initial evidence suggests that personality predicts a range of indicators of successful transitions to VET, even over and above SES, migration background, sex, and cognitive ability. Students who have higher Conscientiousness and Extraversion are more likely to obtain a VET position (Nießen et al., 2020) and to find a job after completing their studies (Gilar et al., 2015). In addition, Conscientiousness is an important selection criterion for employers (e.g., Caldwell & Burger, 1998; Dunn et al., 1995; Moy & Lam, 2004).

#### 3.3.4 The Present Study

Although the evidence reviewed above has cast light on the determinants and consequences of aspirations and attainment separately, the degree to which youth are able to *realize* their aspirations—that is, whether they experience an AAG or not—has hardly been the subject of prior research. In the present study, we therefore focused on the occupational AAG as a complementary measure of successful transitions from school to work. Using representative longitudinal data about young people's transitions from intermediate secondary schools (*Realschule*) to VET in Germany, we sought to answer two questions. First, we aimed to establish how many adolescents were (un)able to realize their occupational aspirations in the transition to VET—that is, what percentage of students experienced an AAG (*prevalence*), and how large this gap was (*magnitude*). Second, we aimed to unravel why some adolescents may experience an AAG (*predictors*). More specifically, we investigated (a) whether sociostructural

characteristics, cognitive ability, school grades, and personality traits predicted the AAG directly (direct effects); (b) whether these variables did so indirectly, that is, mediated via occupational aspirations (indirect effects); or (c) whether they did so both directly and indirectly. Figure 3.1 summarizes our research questions.

**Figure 3.1:** Schematic Depiction of the Research Questions and the Time Assessment of the Variables



*Note.* SES = socioeconomic status, VET = vocational education and training.

The transition from school to VET is the typical school-to-work transition for *Realschule* graduates in Germany because they are eligible only to take up VET. Their aspirations are therefore an important construct, reflecting possible differences in the “horizon of perceived possibilities” (Schoon & Heckhausen, 2019, p. 140). Given that individuals who underwent VET generally stay in the occupation for which they have trained, the SES associated with that occupation will typically not change much in their further life course. Therefore, the attained VET position is a suitable measure for a young person’s occupational attainment (for more details of the highly structured education system and dual system of VET in Germany, see Appendix A).

Our hypotheses concerning the predictors of the AAG are based on the previous research reviewed earlier. We expected, first, that higher occupational aspirations would be associated with a higher likelihood of experiencing an AAG (see, e.g., Buttaro et al., 2010) be-

cause higher aspirations carry a higher risk of failure. Second, we expected that sociostructural characteristics that reflect higher resources (i.e., higher parental SES and cultural capital; see, e.g., Schoon, 2010; Schoon & Polek, 2011), and female sex (see, e.g., Schoon & Polek, 2011; Wicht et al., 2021) would be associated with both higher aspirations and higher attainment, and hence a lower likelihood of experiencing an AAG. We expected that students with a migration background would express higher aspirations than native Germans but would show lower attainment (see, e.g., McElvany et al., 2018) and hence have a higher likelihood of experiencing an AAG. Third, we expected that higher cognitive ability (see, e.g., Deary et al., 2007; Schoon & Polek, 2011) and school grades (see, e.g., Kay et al., 2016; Paat, 2015) would be associated with both higher aspirations and a lower probability of experiencing an AAG because these variables are linked to higher attainment. Fourth, we expected that students with higher Conscientiousness, Emotional Stability, and Extraversion and with lower Openness and Agreeableness would have a lower probability of experiencing an AAG, because these characteristics are associated with higher attainment (see, e.g., Lechner et al., 2019). We also tested possible associations between the Big Five and aspirations in an exploratory fashion in order to generate novel hypotheses for future research.

## 3.4 Material and Methods

### 3.4.1 Dataset and Sample

Our analyses are based on the German National Educational Panel Study (NEPS), Starting Cohort 4 (Blossfeld & Roßbach, 2011; <https://doi.org/10.5157/NEPS:SC4:9.1.1>), which provides in-depth information on students' transition from school to VET. These data comprise a large and representative sample of initially 15,110 ninth graders in 540 regular schools (i.e., the sample of students excluding those who attended special schools [*Förderschulen*]). The sample was representative of German ninth graders and was drawn in a two-stage procedure: First, schools in Germany were randomly drawn, and then the classes within the drawn schools were randomly drawn. The first survey was carried out in ninth grade in the classroom via paper-and-pencil interviewing (PAPI) in autumn 2010 (Wave 1), followed by a second survey in ninth grade in spring 2011 (Wave 2). From 10th grade onwards, subsequent surveys took place annually in the classroom via PAPI (Waves 3–8; i.e., 2011–2015). Respondents who had left the general education system were interviewed biannually (Waves 3–

6; i.e., 2011–2013) and later annually (Wave 7 [i.e., 2013] onwards) using computer-assisted telephone interviewing (CATI). We used data from Wave 1 to Wave 9 (i.e., 2010–2015).

We deliberately restricted our analysis to school leavers from intermediate secondary schools (*Realschule*; International Standard Classification of Education 1997 Level 2A [ISCED-97]; Schneider, 2008). Both substantive and design-related considerations guided our decision to exclude school leavers from the other two typical secondary school types in Germany. First, students from general secondary schools (*Hauptschule*; ISCED-97 Level 2B) may leave the general school system after ninth grade, and hence could have already been accepted for a VET position at the time aspirations were measured in the current data, potentially introducing bias in our analyses. Second, the current release of the NEPS data (at the time when this study was being conducted) did not allow for investigating the AAG of students attending academically oriented secondary schools (*Gymnasium*; ISCED-97 Level 3A) because they have not yet started VET or tertiary education. Moreover, contrary to *Realschule* students, the transition from school to VET is not the typical transition for these students—in 2018, only about 21% of *Gymnasium* graduates started a VET position, whereas 79% went on to attend a higher education institution (Statistisches Bundesamt [Destatis], 2019)—and unlike occupations learned in VET, university studies do not correspond to specific occupations that can be coded with an SES.

In the initial sample of 15,110 ninth graders, 5,341 (32.5%) were attending *Realschule* in Wave 1, over half of whom (2,849; 53.3%) transitioned from *Realschule* to a fully qualifying VET position (i.e., a position that leads to full vocational qualification) during the observation period (Waves 3–9). We excluded 371 of these students because they either did not provide information on their occupational aspirations, or their reported aspirations were too vague to be coded. The final analytical sample thus consisted of 2,478 students, who were, on average, 15.2 years old at the time of their initial interview in ninth grade ( $SD = 0.6$ , Min. = 12, Max. = 18).

### 3.4.2 Measures

#### 3.4.2.1 Aspiration–Attainment Gap

Our measure of the AAG was the difference between the SES of students' occupational aspirations and of the VET position they actually attained. With regard to occupational aspirations, we used students' realistic aspirations measured in ninth grade, that is, before the transition to VET after completion of 10th grade (Wave 2; i.e., 2011). Realistic occupational aspira-

tions (also called expectations; e.g., Ashby & Schoon, 2012; Rehberg, 1967; Reynolds & Pemberton, 2001) refer to the specific occupations that students expect to attain in the future, taking into account their perceived opportunity structure, including individual resources and external constraints (Rehberg, 1967). NEPS assessed these aspirations with the open-ended question: “And considering everything you know now: What [occupation] will you actually [take up] in the future?” (NEPS, 2019, p. 907).<sup>6</sup>

With regard to the attained VET position, we used each student’s first stable (i.e., lasting at least 3 months) and fully qualifying VET position after general schooling (i.e., after leaving *Realschule*). Depending on how long the search duration lasted before entering VET, we used information from Waves 5–9 (i.e., 2012–2015; Wave 9 was the last wave available at the time of conducting the present study). As occupational aspirations, the measurement of the attained VET position, in NEPS, was assessed with an open-ended question: “In which [occupation] exactly are you doing/did you do the vocational training as part of your dual vocational training and degree program? Please specify the exact name, for instance[,] how it is stated in your training contract” (NEPS, 2019, p. 123).

NEPS classifies students/apprentices’ open-ended responses into several standard occupational classification schemes. In order to map the SES associated with the aspired occupation and the attained VET position, we used the International Socio-Economic Index (ISEI; Ganzeboom et al., 1992). ISEI is a well-validated (internationally and nationally) and frequently used standard measure of SES that is conceptually compelling because the SES of an occupational position captures not only the associated income but more broadly also the years of education required to qualify for that occupation (Züll, 2016). The latest version from 2008 (i.e., ISEI-08) is an index estimated and validated using data from the International Social Survey Program (ISSP) from 2002–2007 on the occupation, education, and personal income of 200,000 working people in 42 countries around the world (including Germany; Ganzeboom, 2010). Moreover, ISEI is well suited for our purpose because it allows assigning a quantitative status to a qualitative position (e.g., baker: 23.57; banker: 68.54; nurse: 68.70;

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<sup>6</sup> If the students’ expectations matched their actual chances on the training market, there should be no major gap between their aspirations and what they attained. Realistic aspirations should not be mistaken for *idealistic* aspirations (also simply called aspirations; e.g., Ashby & Schoon, 2012; Rehberg, 1967; Reynolds & Pemberton, 2001) that represent wishes and dreams about what one desires ideally. In the latter case, an AAG would be expected. For comparison, the question that precedes the measurement of realistic aspirations in the questionnaire surveys the idealistic aspirations: “Regardless of your current situation, what [occupation] would you most like to [take up] in the future?” (NEPS, 2019, p. 907).

mathematician: 81.78), with very high interrater reliability (e.g., Maaz et al., 2009). Examples of occupations with the lowest ISEI-08 scores include gardeners (11.56) and cleaners (14.20), whereas examples of occupations with the highest ISEI-08 scores include doctors (88.70) and judges (88.96).

Using ISEI, we were able to directly compare the SES of the attained VET position and the SES of the aspired occupation. We computed the AAG as the difference score between the ISEI of the attained VET position and the ISEI of students' realistic occupational aspirations:

$$\text{AAG} = \text{ISEI}_{\text{attained VET position}} - \text{ISEI}_{\text{aspired occupation}}$$

Negative values on this measure indicate that students were unable to fully realize their aspirations, and thus experienced an AAG. For our analyses, we computed a binary AAG variable assigning students to one of two groups: (a) a reference group with a difference score  $\geq 0$ , that is, adolescents who did not experience a gap; and (b) the focal group of adolescents with a difference score  $< 0$ , that is, adolescents who experienced a gap. In addition to the binary AAG variable, we also used the aforementioned continuous AAG variable (difference score) measuring the size of the AAG for the focal group of students whose attained VET position fell short of their aspirations.

### 3.4.2.2 Sociostructural Characteristics (Waves 1–2)

We used measures of students' parental SES, cultural capital, ethnic origin, and sex to capture their sociostructural background. Parental SES was measured with ISEI-08, which has the same metric as students' aspirations. Cultural capital was measured with the number of books available in the household, with a scale ranging from 1 (*0–10 books*) to 6 (*more than 500 books*), which is the most widely used proxy of cultural capital (Sieben & Lechner, 2019).<sup>7</sup> Students' ethnic origin was determined by information on the country of birth of the students, their parents, and their grandparents. We distinguished between native German (reference category), first-generation migrant, and second-generation migrant. Students' sex was measured with a binary indicator (1 = *male*, 2 = *female*).

<sup>7</sup> We checked in advance whether the effects were linear. Because this was the case, we treated the variable as continuous.



### 3.4.2.3 Cognitive Ability and School Grades (Wave 2)

We included measures of students' cognitive ability and school grades. Cognitive ability was measured with the NEPS reasoning test, NEPS-MAT, a figural reasoning task that assesses general cognitive ability with 12 items (see Pohl & Carstensen, 2012), with possible sum scores ranging from 0 to 12. The internal consistency of NEPS-MAT can be found in Table 1 in Section 3.4.2.6. We recorded students' average school grade in German and math based on their final report card at the end of Grade 9. We recoded grades such that higher values reflected higher/better grades. Recoded grades have a theoretical range from 1 (*low/bad*) to 6 (*high/good*).

### 3.4.2.4 Personality Traits (Wave 1)

We used the Big Five personality traits Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness to Experience (Costa & McCrae, 1992; Goldberg, 1992). The Big Five is currently the most widely used and empirically best validated model of personality. In NEPS, the Big Five traits were assessed with 11 items—10 items from the 10-Item Big Five Inventory (BFI-10; Rammstedt & John, 2007), an established, well-validated 10-item short scale, and an additional item for Agreeableness. Students answered all items on a 5-point response scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). As a measure of the internal consistency (reliability) of the Big Five scale scores, we used the Spearman-Brown formula. In the present sample, reliabilities ranged between .36 (Agreeableness) and .63 (Extraversion). These scores can be deemed sufficient for (ultra-)short scales because the items are intended to cover heterogeneous facets of the Big Five dimensions (Rammstedt & John, 2007). In general, as previous research has demonstrated, the BFI-10's test-retest reliabilities are much higher than its internal consistencies (on average  $r_{tt} = .75$ ; see Rammstedt & John, 2007). In addition, the BFI-10's predictive validity is almost as high as, and occasionally even higher than, the predictive validity of longer Big Five inventories (Rammstedt et al., 2021; Thalmayer et al., 2011).

### 3.4.2.5 Search Duration (Waves 5–9)

We additionally examined the effect of search duration (i.e., the number of months it took students to obtain a VET position after school graduation) on the AAG because of two reasons: On the one hand, longer search durations might increase students' chances of obtaining a coveted VET position, which matches their aspirations (see job search theory; e.g., Lippman & McCall, 1976). On the other hand, after a certain threshold, the negative signaling effect of

time spent in unemployment, and the downward adjustment of expectations might force students to accept VET positions that fall short of their aspirations (see signaling theory; e.g., Spence, 1974).

### 3.4.2.6 Descriptive Statistics

Table 3.1 displays the descriptive statistics and reliability estimates (if applicable) of all variables in the present sample. The correlations between the variables are depicted in Appendix B. Associations between the predictor variables of our study were mostly small, thereby allaying concerns about possible multicollinearity.

**Table 3.1:** *Descriptive Statistics of the Variables*

Variables	Min.	Max.	<i>M</i> or %	<i>SD</i>	Cronbach's $\alpha$	Wave	<i>N</i>
Aspirations	11.56	88.96	47.33	16.72	-	2	2,478
Attained VET position	11.56	83.50	39.70	13.32	-	5–9	2,478
AAG	0.00	–71.00	–9.25	14.46	-	-	2,478
Parental SES	13.34	88.96	46.62	18.30	-	1–2	2,226
Cultural capital	1	6	3.59	1.35	-	1–2	2,317
Ethnic origin	1	3	-	-	-	1–2	2,478
German	1	1	81.11	-	-	1–2	2,010
First-generation migrant	2	2	4.60	-	-	1–2	114
Second-generation migrant	3	3	14.29	-	-	1–2	354
Sex	1	2	-	-	-	1–2	2,478
Male	1	1	53.55	-	-	1–2	1,327
Female	2	2	46.45	-	-	1–2	1,151
Cognitive ability	0	12	8.41	2.35	.63	2	2,348
School grades <sup>a</sup>	1.25	5.50	3.15	0.60	-	2	2,463
Extraversion	1	5	3.45	0.88	.63	1	2,348
Agreeableness	1	5	3.48	0.66	.36	1	2,341
Conscientiousness	1	5	3.21	0.85	.48	1	2,368
Emotional Stability	1	5	3.24	0.84	.40	1	2,360
Openness	1	5	3.41	0.94	.41	1	2,366
Search duration	1	54	4.54	6.58	-	-	2,478

*Note.* VET = vocational education and training, AAG = aspiration–attainment gap, SES = socioeconomic status.

<sup>a</sup> Higher values reflect higher grades.

### 3.4.3 Analyses

In a first step, we descriptively examined how many students experienced an AAG (using the binary AAG variable), and how large the gap was among those who experienced it (using the continuous AAG variable). In a second step, we estimated two-part linear regression models (e.g., Neelon & O'Malley, 2019) to identify factors that predicted the AAG (see Figure 3.1). The two-part models enabled us to look at two different processes: first, the factors that pre-

dicted whether or not students would experience an AAG (Part I); second, the factors that predicted the size of the AAG among those who experienced it (Part II). The first part was estimated by a linear probability model, and the second part by a linear regression model. Within the two-part model, we applied path models to disentangle whether the different factors under study predicted students' AAG directly or indirectly through their occupational aspirations (see Figure 3.1). In doing so, we calculated the direct, indirect, and total effects of the predictor variables on the AAG. We obtained indirect effects through the product-of-coefficient method. The total effects are the sum of the direct and indirect effects. We used bias-corrected bootstrap (10,000 replications) to calculate the standard errors of all effects, because this procedure does not require assumptions about the sampling distribution of the estimated effects (MacKinnon, 2008). In order to account for the clustering of observations within schools, we used a Huber-White sandwich estimator to obtain cluster-robust standard errors (Williams, 2000).

We ran the analyses with Mplus Version 8.1 (Muthén & Muthén, 1998–2017). To deal with missing values of independent variables, we used full information maximum likelihood (FIML) estimation. Therefore, correlations between the predictors were allowed. To facilitate comparisons of effects sizes, we standardized all continuous independent variables (i.e., parental SES, cultural capital, cognitive ability, school grades, Big Five personality traits, search duration) so that the regression coefficients indicate the effect on the dependent variable of a change of 1 *SD* deviation in the independent variables.

## 3.5 Results

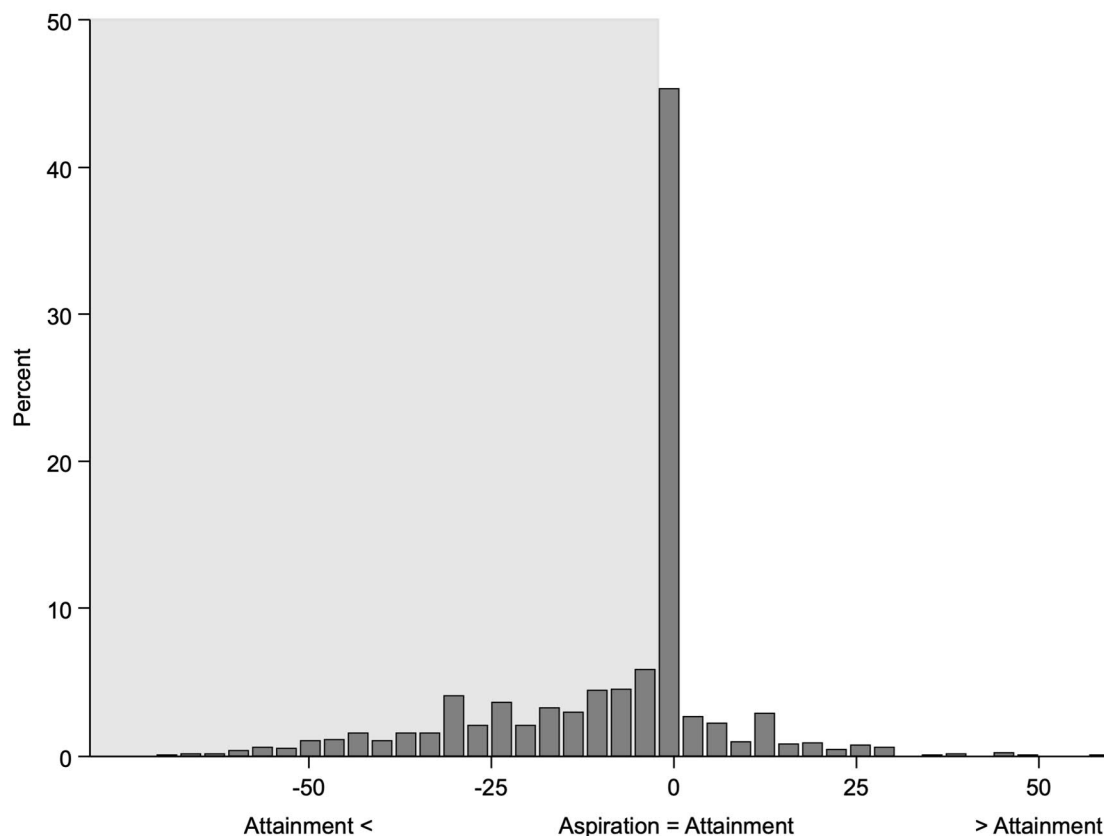
### 3.5.1 Prevalence and Magnitude of the AAG

Figure 3.2 shows the distribution of the AAG. As the peak at zero shows, 1,000 (40.4%) of the students in our sample were able to realize their aspirations by attaining a VET position with exactly the same SES as that associated with their aspired occupation, and 340 (13.7%) attained a VET position with an even higher SES than that of the occupation to which they had aspired. In other words, 54.1% of the students realized, or even exceeded, their aspirations in their VET position. However, 1,138 students (45.9%) were unable to realize their occupational aspirations in their attained VET position, as indicated by an AAG < 0.

The average size of the AAG among those who experienced it (i.e., AAG < 0) was  $-20.14$  ISEI points ( $SD = 15.37$ ), with the largest gap amounting to  $-71.00$  points. In order to

have this average AAG of  $-20$  ISEI points, a student would have to indicate, for example, social work associate professional (ISEI score: 52.72) as occupational aspirations, but then end up in a VET position as stock clerk (ISEI score: 32.50). The average earnings difference to be expected in the working life would then be 1,075 euros. However, most of the AAG values were not as extreme as the maximum value might suggest, with 90% of all AAG values ranging between  $-3.00$  and  $-43.00$ . As Appendix C shows, larger values for the AAG were very rare.

**Figure 3.2:** *Percentages of the Distribution of the Aspiration–Attainment Gap*



*Note.*  $N = 2,478$ . As a metric variable, the peak in the middle includes both the zeros and a few additional observations with values close to zero. The shaded gray area to the left of the peak is the focus of our analyses, and represents what we defined as the AAG.

To garner deeper insights into how the distribution of the AAG shown in Figure 3.2 arose, we additionally inspected the distribution of aspirations and the attained VET positions, which together compose the AAG, among those who experienced an AAG. To get a more concrete idea of the ISEI scores and differences, we give sample occupations and their average expected earnings across all age groups and sexes, although it should be noted that salary is only one aspect of ISEI, and education is also included in the SES classification (for the

scores for each International Standard Classification of Occupations 1988 [ISCO-88] occupational title, see Ganzeboom & Treiman, 1996; for the average gross earnings, see <https://web.arbeitsagentur.de/entgeltatlas/><sup>8</sup>).

The average ISEI score of students' aspirations was 55.81 ( $SD = 16.83$ ). The occupations with ISEI scores closest to that average value are life science and health associate professionals (55.40, average gross earning: 3,342 euros) and safety and quality inspectors (55.96, average gross earning: 3,810 euros). The ISEI scores of the occupational aspirations of 90% of all students ranged between 32.50 (stock clerks, average gross earning: 2,812 euros) and 79.74 (architects, average gross earning: 4,122 euros; town and traffic planners average gross earning: 4,658 euros; incl. landscape architects, average gross earning: 3,725 euros). The ISEI score of the highest occupational aspiration reported by any student (judge, average gross earning: 6,140 euros) was 88.96.

On average, students reported having attained VET positions with an ISEI score of 35.65 ( $SD = 11.79$ ). The ISEI scores of 90% of the attained positions ranged between 21.64 (home-based personal care workers, average gross earning: 3,306 euros; incl. attendants, average gross earning: 2,659 euros) and 52.72 (social work associate professionals, average gross earning: 3,887 euros). These occupations can indeed be attained through VET. Importantly, higher ISEI scores—especially those associated with professions that cannot be attained through VET but require tertiary education, such as the highest attained VET position reported (chemist, average gross earning: > 6,450 euros, ISEI score 83.50)—were extremely rare, leading us to conclude that such high values were inconsequential for our analyses.

### 3.5.2 Predicting the AAG

Next, we present the findings from the two-part regression model predicting the AAG.

#### 3.5.2.1 Predicting Who Experienced an AAG (Model Part I)

Table 3.2 displays the regression coefficients (average marginal effects [AMEs]) from a model predicting the probability of experiencing an AAG. Positive associations indicate that a variable is linked to a higher risk of experiencing an AAG, whereas negative associations in-

<sup>8</sup> The specific occupations used are as follows—in the order given in the text: *Assistent – Gesundheits- und Sozialwesen* [assistant – health and social work], *Qualitätskontrolleur* [quality controller], *Fachlagerist* [warehouse clerk], *Architekt* [architect], *Stadt- und Regionalplaner* [urban and regional planner], *Verkehrsplaner* [traffic planner], *Landschaftsarchitekt* [landscape architect], *Richter* [judge], *Ambulanter Pfleger* [ambulant carer], *Betreuungskraft / Alltagsbegleiter* [care worker / daily companion], *Fachkraft – Sozialarbeit* [specialist – social work], *Chemiker* [chemist].

dicating that it is linked to a lower risk. Recall that we standardized all continuous independent variables so that the coefficients for these predictors indicate by how much the risk of experiencing an AAG changes (in %) for a 1 *SD* increase in the predictor. Unstandardized coefficients can be found in Table 3.D1 in Appendix D.

The first column of Table 3.2 presents the total effects of the predictors on the risk of experiencing an AAG—that is, the sum of the direct and indirect effects. Few effects were statistically significant, and most effect sizes were small to moderate. Two sociostructural characteristics showed total effects on the risk of an AAG: Having a migration background was linked to a 9.6%–13.6% higher risk of experiencing an AAG, and a 1 *SD* (or 1.4 raw scale points) higher cultural capital was linked to a 3.3% higher risk. In addition, higher Openness predicted a 2.7% higher risk of experiencing an AAG (for a 1 *SD* increase in Openness, i.e., 0.9 scale points), and lower school grades predicted a 2.3% higher risk of an AAG (for 1 *SD* lower grades, i.e., 0.6 grade points). The maximum difference between a student scoring at the lowest possible school grade (i.e., 1) and the highest possible grade (i.e., 6) was  $(6-1) \times 3.8\% = 19.0\%$ , which is sizeable, and larger than that of all other variables. The maximum difference for Openness was 11.6%, which was larger than that of migration background and similar to that of cultural capital (12.0%).

However, closer inspection revealed that behind several of these total effects—even those that were small and statistically non-significant—there were several direct and indirect effects. Most of these direct and indirect effects were in opposite directions, so that the effects offset each other (indicating suppression effects). Next, we disentangle direct effects from indirect effects through aspirations to gain a better understanding of each predictor’s role.

The second column of Table 3.2 displays the direct effects of the predictors, and the effect of aspirations (which was a mediator in our model). The level of aspirations was by far the strongest predictor of the risk of experiencing an AAG: An increase in aspirations of 1 *SD* (i.e., 16.7 ISEI scores) corresponded to a 24.8% higher probability of experiencing an AAG. In other words, the higher students’ aspirations were, the greater was their risk of not realizing them. Male sex was also associated with a higher risk of experiencing an AAG (12.0% higher probability); 1 *SD* lower school grades resulted in a 3.4% higher probability; 1 *SD* (i.e., 6.6 months) longer search durations resulted in a 3.0% higher probability; 1 *SD* (i.e., 18.3 ISEI scores) lower parental SES resulted in a 2.4% higher probability; and 1 *SD* (i.e., 0.7 scale points) lower Agreeableness resulted in a 2.0% higher probability of experiencing an AAG.

The maximum difference between a person with the lowest possible level of the respective predictor and a person with the highest possible level changed the order of the single pre-

dictors in terms of strength slightly: With 116.1%, higher aspirations had by far the largest influence on the risk of an AAG, followed by lower grades (28.5%), longer search durations (26.5%), lower Agreeableness (12.0%), male sex (12.0%), and lower parental SES (7.7%). Because the direct effects correspond to the effects on the AAG when controlling for aspirations, they can be interpreted as effects related to students' attainment of a VET position.

The last column of Table 3.2 shows the indirect effects through aspirations. Via aspirations, female sex turned out to be most strongly related to a higher risk of experiencing an AAG (13.1% higher probability), followed by having a migration background (7.4%–8.2% higher probability). Moreover, via aspirations, 1 *SD* higher parental SES predicted a 3.8% higher probability of experiencing an AAG; 1 *SD* higher cultural capital predicted a 2.3% higher probability; 1 *SD* higher school grades predicted a 1.2% higher probability; 1 *SD* (i.e., 0.8 scale points) higher Emotional Stability predicted a 1.2% higher probability; and 1 *SD* higher Openness predicted a 1.1% higher probability. The maximum difference between a student with the lowest possible level of the respective predictor and a student with the highest possible level barely changed the order of the single predictors in terms of strength: Once again, higher parental SES, mediated by aspirations, had the strongest effect on the risk of experiencing an AAG (15.5% higher probability). With a 9.5% higher probability of experiencing an AAG, higher school grades, mediated by aspirations, were somewhat more predictive of experiencing an AAG than higher cultural capital (8.5% higher probability), a migration background, higher Emotional Stability (5.6% higher probability), and higher Openness (4.8% higher probability).

Regarding the effects of the various characteristics on the level of aspirations (i.e., the mediator), we found that aspirations were higher in some social groups than in others. Sociostructural characteristics, in particular, were associated with occupational aspirations: Higher parental SES, higher cultural capital, a migration background, and female sex predicted higher aspirations. With respect to the Big Five, only higher Emotional Stability and higher Openness were related to higher aspirations. Furthermore, higher school grades had a positive effect on the level of aspirations. Detailed results can be found in Appendix E.

**Table 3.2:** *Predicting the Risk of Experiencing an AAG (Model Part I)*

	Total effects			Direct effects			Indirect effects through aspirations		
	AME	95% CI	p	AME	95% CI	p	AME	95% CI	p
Aspirations				<b>.248</b>	[.232, .263]	<.001			
Sociostructural characteristics									
Parental SES	.014	[−.007, .035]	.191	−.024	[−.043, −.004]	.014	<b>.038</b>	[.027, .050]	<.001
Cultural capital	<b>.033</b>	[.012, .054]	.003	.010	[−.009, .028]	.301	<b>.023</b>	[.012, .034]	<.001
First-generation migrant*	<b>.136</b>	[.040, .232]	.005	.054	[−.028, .137]	.199	<b>.082</b>	[.036, .131]	.001
Second-generation migrant*	<b>.096</b>	[.034, .158]	.002	.023	[−.032, .075]	.410	<b>.074</b>	[.045, .104]	<.001
Female*	.011	[−.030, .053]	.600	−.120	[−.156, −.083]	<.001	<b>.131</b>	[.112, .152]	<.001
Cognitive ability and school grades									
Cognitive ability	−.007	[−.027, .013]	.500	−.016	[−.033, .001]	.066	.009	[−.001, .019]	.070
School grades <sup>a</sup>	−.023	[−.043, −.002]	.029	−.034	[−.052, −.017]	<.001	<b>.012</b>	[.002, .021]	.014
Personality traits									
Extraversion	.014	[−.007, .035]	.183	.009	[−.010, .029]	.334	.005	[−.006, .015]	.365
Agreeableness	−.014	[−.033, .006]	.172	−.020	[−.037, −.002]	.028	.006	[−.004, .016]	.246
Conscientiousness	−.016	[−.039, .007]	.176	−.007	[−.026, .012]	.455	−.009	[−.019, .002]	.104
Emotional Stability	.012	[−.012, .035]	.305	.001	[−.020, .020]	.958	<b>.012</b>	[.001, .022]	.029
Openness	<b>.027</b>	[.005, .049]	.015	.016	[−.004, .036]	.119	<b>.011</b>	[.001, .021]	.031
Search duration				<b>.030</b>	[.010, .049]	.002			

*Note.*  $N = 2,478$  ( $n = 1,138$  for  $AAG < 0$ ;  $n = 1,340$  for no  $AAG$ ).  $AAG$  = aspiration–attainment gap,  $AME$  = average marginal effect,  $CI$  = confidence interval,  $SES$  = socioeconomic status. Coefficients significant at the  $p < .05$  level are in bold type. Continuous coefficients are standardized with regard to  $X$  (the independent variables) but not  $Y$  (the dependent variable, i.e., the  $AAG$ ). Variables marked with an asterisk (\*) are not standardized.

<sup>a</sup> Higher values reflect higher grades.



**Table 3.3:** Predicting the Size of the AAG of Those Who Experienced a Gap (Model Part II)

	Total effects			Direct effects			Indirect effects through aspirations		
	<i>b</i>	95% CI	<i>p</i>	<i>b</i>	95% CI	<i>p</i>	<i>b</i>	95% CI	<i>p</i>
Aspirations				<b>8.519</b>	[7.890, 9.186]	<.001			
Sociostructural characteristics									
Parental SES	<b>1.019</b>	[0.224, 1.826]	.013	-0.288	[-0.951, 0.371]	.394	<b>1.307</b>	[0.919, 1.705]	<.001
Cultural capital	0.214	[-0.592, 0.991]	.599	-0.584	[-1.282, 0.104]	.099	<b>0.798</b>	[0.429, 1.181]	<.001
First-generation migrant*	1.398	[-1.933, 4.965]	.420	-1.419	[-4.449, 1.874]	.377	<b>2.817</b>	[1.261, 4.438]	<.001
Second-generation migrant*	1.563	[-0.354, 3.549]	.120	-0.969	[-2.748, 0.841]	.290	<b>2.532</b>	[1.540, 3.591]	<.001
Female*	<b>3.633</b>	[2.117, 5.178]	<.001	-0.872	[-2.343, 0.590]	.241	<b>4.505</b>	[3.880, 5.200]	<.001
Cognitive ability and school grades									
Cognitive ability	-0.069	[-0.825, 0.723]	.861	-0.385	[-1.062, 0.340]	.280	0.315	[-0.034, 0.659]	.073
School grades <sup>a</sup>	0.707	[-0.005, 1.413]	.052	0.306	[-0.344, 0.977]	.359	<b>0.401</b>	[0.077, 0.726]	.014
Personality traits									
Extraversion	0.049	[-0.727, 0.821]	.900	-0.113	[-0.771, 0.537]	.736	0.162	[-0.182, 0.526]	.366
Agreeableness	0.622	[-0.157, 1.414]	.122	0.414	[-0.278, 1.111]	.241	0.208	[-0.140, 0.565]	.248
Conscientiousness	<b>-0.969</b>	[-1.782, -0.166]	.018	-0.676	[-1.426, 0.064]	.073	-0.294	[-0.651, 0.062]	.108
Emotional Stability	-0.289	[-1.017, 0.463]	.449	<b>-0.688</b>	[-1.340, -0.003]	.046	<b>0.399</b>	[0.047, 0.760]	.027
Openness	0.096	[-0.677, 0.835]	.804	-0.285	[-1.025, 0.412]	.435	<b>0.381</b>	[0.036, 0.731]	.031
Search duration				<b>-1.004</b>	[-1.599, -0.344]	.002			

*Note.*  $N = 2,478$  ( $n = 1,138$  for  $AAG < 0$ ;  $n = 1,340$  for no AAG). AAG = aspiration-attainment gap, CI = confidence interval, SES = socioeconomic status. Coefficients significant at the  $p < .05$  level are in bold type. Continuous coefficients are standardized with regard to X (the independent variables) but not Y (the dependent variable, i.e., the AAG). Variables marked with an asterisk (\*) are not standardized.

<sup>a</sup> Higher values reflect higher grades.

### 3.5.2.2 Predicting the Size of the AAG (Model Part II)

Model Part II predicted the size of the AAG among the 1,138 students who experienced an AAG (i.e., attainment < aspirations). Table 3.3 shows the regression (path) coefficients from the model predicting the size of the AAG. Recall that all continuous independent variables were standardized (unstandardized coefficients can be found in Table 3.D2 in Appendix D). A positive association means that the gap increases in size, whereas a negative association means that the gap decreases in size.

The first column of Table 3.3 presents the total effects of the predictors on the size of the AAG. Of the sociostructural characteristics, precisely the two variables that had no effect in Model Part I showed an association with the size of the AAG in the case of total effects: Sex had the largest effect on the size of the AAG, followed by parental SES. The AAGs of females were 3.6 ISEI points larger than those of males, and a 1 *SD* higher parental SES was linked to a 1.0 ISEI points larger AAG. Of the Big Five, 1 *SD* (i.e., 0.9 scale points) lower Conscientiousness was associated with 1.0 ISEI points larger AAGs.

However, once again behind several of these (significant or non-significant) total effects there were several direct or indirect effects, some of which were in opposite directions. The second column of Table 3.3 displays the direct effects of the predictors on the size of the AAG (which, because of how the model is constructed, are equivalent to the predictors' effects on attainment while controlling for aspirations). In contrast to Model Part I, sociostructural characteristics did not predict the size of the AAG. As with Model Part I, aspirations again had the strongest effect, meaning that 1 *SD* higher initial aspirations corresponded to 8.5 ISEI points larger AAGs. Moreover, 1 *SD* lower Emotional Stability was associated with 0.7 ISEI points larger AAGs, and 1 *SD* shorter search durations were associated with 1.0 ISEI points larger AAGs.

The last column of Table 3.3 shows the indirect effects mediated by aspirations. With respect to the indirect effects, we found the exact same pattern of significant predictors as we did in Part I, because these characteristics predicted occupational aspirations (see Appendix E). All sociostructural characteristics indirectly contributed—via aspirations—to the size of the AAG, indicating that, mediated by aspirations, larger AAGs were indirectly predicted by 1 *SD* higher parental SES (1.3 ISEI points larger AAGs), 1 *SD* higher cultural capital (0.8 ISEI points larger AAGs), being female (4.5 ISEI points larger AAGs), and a migration background (2.5–2.8 ISEI points larger AAGs). Furthermore, 1 *SD* higher school grades (0.4 ISEI points larger AAGs), 1 *SD* higher Emotional Stability (0.4 ISEI points larger

AAGs), and 1 *SD* higher Openness (0.4 ISEI points larger AAGs) were indirectly related to larger AAGs via aspirations. Emotional Stability had a direct negative effect on the size of the AAG related to students' attainment of a VET position and, via aspirations, a positive indirect effect on the size of the AAG, resulting in a non-significant total effect—that is, a suppression effect.

### 3.6 Discussion

The present study proposes a new perspective on successful school-to-work transitions by focusing on students' ability, or inability, to realize their occupational aspirations, that is, the aspiration–attainment gap (AAG)—or the absence thereof. More specifically, we investigated this gap in intermediate secondary school (*Realschule*) students in Germany who transitioned to their first VET position after finishing compulsory schooling in Grade 10.

#### 3.6.1 Distribution of the Occupational AAG

Our first aim was to ascertain the *prevalence* of how many students in our sample experienced an AAG after the transition from school to VET, and the *magnitude* of how large this gap was among those who experienced it. Our analyses showed that about one half of the students were able to realize or even exceed their occupational aspirations, which means that their *realistic* occupational aspirations were indeed quite realistic. However, there was a substantial percentage of students (45.9%) whose VET positions fell short of their occupational aspirations in terms of SES—that is, these students experienced an AAG.

Experiencing an AAG is problematic for two reasons. First, experiencing an AAG is associated with lower well-being, job satisfaction, and higher levels of depressive symptoms (e.g., Carr, 1997; Hardie, 2014; Nießen et al., 2021). Second, a discrepancy between aspirations and attainment is likely to have unfavorable long-term effects on career development (as surmised, e.g., by Tomasik et al., 2009). The average discrepancy between the SES of the occupational aspirations and the attained VET position among those who experienced an AAG was  $-20.14$ ; extreme AAG values (i.e., deciles above 90%, that is, values larger than  $-43$ ) were rare.

One explanation for the few extremely high AAG values that we observed might be that students with the highest aspirations ( $\leq 88.96$ ) had exaggerated and unrealistic ideas about their possibilities. For example, it is very unlikely that someone with an intermediate school-leaving qualification will become a judge. Another reason might be that some students hope

to attain a seemingly unattainable profession (e.g., doctor) via second-chance education, for instance by going to university after completing their VET (e.g., as a nurse or a paramedic). In Germany, the number of those who start tertiary education without completing the upper level of *Gymnasium* and passing the *Abitur* examination (i.e., who have acquired their higher education entrance qualification through VET in combination with work experience; for more details, see Nickel et al., 2020) has risen steadily over the last two decades, but still represents only a small percentage. In 2018, the proportion of higher education students without *Abitur* was 2.2%, and the proportion of university graduates without *Abitur* was 1.8% (Nickel et al., 2020). Moreover, people who undergo VET usually stay in the occupation for which they have trained. In addition, it is not easily possible for non-college-bound students to continue their education after completing VET with subsequent tertiary education.

For these reasons, we consider the AAG to be a generally undesirable (yet underappreciated) phenomenon, which calls for the development of policy measures and interventions. To avoid disappointment, on the one hand, students could be given support in forming aspirations so that aspirations—though they should be as high as possible—remain within reachable bounds. On the other hand, institutions should support students in fulfilling their aspirations—especially, in the case of disadvantaged groups who have greater difficulty in finding a VET position (e.g., those with a migration background or lower cognitive ability; see, e.g., Nießen et al., 2020). In concrete terms, for example, career counseling could also take on a mediation function by providing contacts to companies and helping with networking.

### 3.6.2 What Explains the Occupational AAG?

Our second aim was to identify *predictors* (i.e., possible determinants) of the occupational AAG. The initial level of aspirations emerged as the strongest predictor. A 1 *SD* (about 17 ISEI scores) increase in aspirations corresponded to an almost 25% higher risk of experiencing an AAG, and to an about 9 ISEI points larger AAG among those who experienced it. At first glance, these effects seem to be inconsistent with previous findings showing that higher aspirations predict higher occupational attainment (e.g., Rojewski, 2005; Schoon & Polek, 2011). Whereas their positive effects on attainment portray higher aspirations as something generally desirable, our results alert to the fact that higher aspirations also entail a higher risk of not realizing these aspirations. Simply put, higher aspirations may foster attainment, but at the same time they may render students more prone to failure. This may indicate that high *realistic* aspirations are often not a truly realistic reflection of students' actual abilities

and their chances on the labor market, especially among students who are disadvantaged and lack key resources and abilities.

A second key finding was that aspirations—besides predicting the AAG incrementally, over and above all other predictors in our model—also mediated the effects of several other predictors on the AAG. Thus, aspirations played a dual role in determining whether someone experienced an AAG or not. Sociostructural characteristics, in particular, were indirectly related to the AAG via occupational aspirations. This is in line with our expectations and consistent with previous findings in the literature whereby higher parental SES (e.g., Kay et al., 2016; Salikutluk, 2013; Schoon & Polek, 2011), higher cultural capital (e.g., Wicht, 2016), a migration background (e.g., McElvany et al., 2018; Salikutluk, 2013), and being female (e.g., Guo et al., 2015; Schoon & Polek, 2011; Wicht et al., 2021) are related to higher aspirations (see Appendix E). Higher school grades were also indirectly associated with the risk and size of an AAG, which is in line with evidence from previous studies that higher educational achievement is related to higher aspirations (e.g., Kay et al., 2016; Salikutluk, 2013). In both model parts (higher risk of an AAG, and the size of the AAG when it was experienced), the same variables indirectly predicted the AAG via the level of aspirations.

A third main finding was that there were differences between direct, indirect, and total effects in the sense that direct and indirect effects were often in opposite directions—that is, their arithmetic signs were reversed. In other words, some non-existing and non-significant total effects masked the presence of direct and indirect effects. Total effects alone are therefore potentially misleading because some predictors in our model predicted the AAG in opposite ways—indirectly, via aspirations (indirect effects), and incrementally, over and above aspirations (direct effects). The central findings with regard to this issue are the following: On the one hand, after statistically controlling for aspirations (i.e., holding aspirations constant), higher parental SES, female sex, and higher Emotional Stability predicted higher attainment, and hence a lower risk of experiencing an AAG (or a greater chance of experiencing a smaller AAG). On the other hand, by raising aspirations, the same characteristics indirectly increased the risk of experiencing an AAG (or of experiencing a larger AAG). The bottom line is that some characteristics and resources that as direct effects are advantageous for the AAG (i.e., that predict a lower risk or smaller gaps) turned out to be disadvantageous in terms of their indirect effects (i.e., higher risk or larger gaps), often to the extent that direct and indirect effects cancelled each other out and resulted in a zero total effect. This demonstrates that higher aspirations of students with, for example, higher parental SES are not necessarily beneficial.

What are the reasons for the divergent indirect and direct effects of many characteristics? As outlined in the theory section, individual characteristics may be relevant for the levels of both aspirations and attainment. The levels of these variables reflect individual self-selection processes and/or institutional selection processes that might underlie differences in the risk of experiencing an AAG. In the case of the direct effects, the findings suggest that a more disadvantaged social background (lower family resources, e.g., parental SES), a lower level of educational achievement (in terms of educational qualifications or school grades), and lower personal resources (lower levels of individual psychosocial and self-regulatory resources, e.g., Emotional Stability and Agreeableness) predicted higher risks of an AAG. This is in line with our expectations that in the selection process these characteristics might act as signals to employers of VET institutions that applicants are less suitable (e.g., Caldwell & Burger, 1998; Nießen et al., 2020; Protsch & Dieckhoff, 2011). Because these characteristics were either associated with lower aspirations or not associated with aspirations at all, students who displayed them did not have exaggerated aspirations.

By contrast, in the case of indirect effects, by raising aspirations, higher individual resources and higher school grades were the characteristics that predicted higher risks of experiencing an AAG and larger AAG sizes. One possible interpretation is that a privileged social background (e.g., higher parental SES, cultural capital), higher school achievement (i.e., grades), and higher psychosocial and self-regulatory resources (i.e., Emotional Stability, Openness) might encourage higher aspirations (see Schoon & Heckhausen, 2019), even though these aspirations might be unattainable. Thus, students with these characteristics were more likely to harbor aspirations that may be unrealistically high.

A fourth main finding is that the risk of experiencing an AAG (*prevalence*) could be better predicted than the size of the AAG (*magnitude*). This could be due to the fact that the sample variance of those who experienced an AAG was restricted, and that the sample size was smaller (54% of the original sample). Lower parental SES, male sex, lower school grades, and lower Agreeableness were directly associated with a higher risk of an AAG, whereas, for the prediction of the size of the AAG, lower Emotional Stability was the only one of our focal predictors to be associated with larger AAG sizes. The direction of the effects are in line with our expectations and with earlier findings that lower parental SES (e.g., Croll & Atwood, 2013; Damian et al., 2015; Kay et al., 2016), male sex (e.g., Buttaro et al., 2010; Mello, 2008; but see Damian et al., 2015; Paat, 2015, who reported the opposite), lower school grades (e.g., Buttaro et al., 2010; Paat, 2015), lower Agreeableness, and lower Emotional Stability (e.g., Damian et al., 2015; Hogan & Holland, 2003) predict lower attainment.

The reason why cognitive ability had no influence—either directly or indirectly—on the AAG remains unclear and needs further investigation. The possibility that the effect of school grades might have suppressed the effect of cognitive ability does not appear plausible, because both measures showed a correlation of only .10. Obviously, visible school achievement, as opposed to unobservable cognitive ability, is decisive in the selection process. This is in line with signaling theory (e.g., Spence, 1974). On a side note, school grades were the only variable that showed direct, indirect, and total effects on the risk of an AAG.

Given the lack of previous studies on the predictive relationship between the Big Five and aspirations, our finding that higher Emotional Stability and higher Openness (for Openness, see Rottinghaus et al., 2002) were associated with higher aspirations is an important contribution to research on aspirations. Apart from the study by Rottinghaus et al. (2002), we could find only one other study that used at least two of the global Big Five dimensions, namely Extraversion and Emotional Stability (Marjoribanks, 1992), but did not find any effects of 12-year-old children's personalities on their educational and occupational aspirations.

Furthermore, the results of the present analyses show that longer search durations (i.e., the time between school graduation and entering the first VET position) also predicted a higher risk of experiencing an AAG (*prevalence*). We interpret this as reflecting a negative signaling effect of time spent in unemployment (see signaling theory; e.g., Spence, 1974). By contrast, the magnitude of AAGs that occurred in students with shorter search durations tended to be greater. This might be because these students picked the first available VET position and did not have the resources to wait for something better. Future research is required to scrutinize these patterns more closely.

### 3.6.3 Limitations and Directions for Future Research

Although this study was the first to analyze the occupational AAG in terms of the discrepancy between the SES of individuals' occupational aspirations and their attained VET positions, some limitations should be mentioned. First, we focused on the transition to VET of school leavers from intermediate secondary schools (*Realschulen*) in Germany. Future research should extend our analyses of the AAG to school leavers from other school types, such as academically oriented secondary schools (e.g., in Germany, the *Gymnasium*), who transition to either VET or tertiary education. Moreover, although starting VET is the first step in the labor market, and determines subsequent career options, our analyses examined only this specific educational transition. Further research is needed to extend these findings and to figure

out whether our results are generalizable to other education systems and transitions such as from VET to the labor market.

Second, only short measures to capture the Big Five personality traits and cognitive ability were available in the data. Although the BFI-10 (Rammstedt & John, 2007) predicts a broad range of criteria, and sometimes does so even better than longer Big Five scales (e.g., Rammstedt et al., 2021; Thalmayer et al., 2011), the internal consistency of the personality dimensions and of the cognitive ability test, NEPS-MAT (Pohl & Carstensen, 2012) were relatively low in the present sample, as is often the case for short scales. Thus, effects of personality and cognitive ability are likely to be conservative estimates. Future studies might garner further insights by using more extensive scales to measure the Big Five and cognitive ability, ideally scales that also allow for a more fine-grained facet-level perspective.

Finally, although there are strong reasons to assume that an AAG is detrimental to job satisfaction, work motivation, and career progression, an important task for future research is to establish the extent to which the AAG actually has such negative consequences for individuals who experience it, and how profound and long-lasting these consequences may be. Experiencing an AAG might also have positive consequences, such as motivating a person to return to education or choose a different career track. Hence, more longitudinal research is needed. For example, future research could analyze both the AAG's influence on the further occupational biography (success in terms of completion of VET, dropout from VET, etc.) and the personal influence (concerning loss of talent, well-being, motivation, etc.). In this context, future research should also consider the AAG multi-dimensionally. We focused on the SES because it is particularly important for career and life prospects. However, comparing the predictors and consequences with regard to different occupational characteristics (e.g., gender typicality, income, average company size, type of work, occupational field, etc.) would expand and complement the picture of the AAG.

### **3.7 Conclusion**

Our analyses revealed that the AAG is quite prevalent: A substantial share of our sample of non-college-bound students (45.9%) in Germany were unable to attain a VET position that matched their prior aspirations in terms of the SES it confers. However, not all youth were equally likely to experience an AAG: The level of aspirations emerged as the strongest predictor, and it also mediated the effect of other predictors, most importantly higher parental SES and higher school grades. Some individual resources proved to be doubly important: On



the one hand, they indirectly increased the risk of experiencing an AAG by raising aspirations; on the other hand, they lowered this risk by directly increasing attainment. Furthermore, our results caution that higher aspirations are not necessarily beneficial: Although they may foster attainment, they also entail a higher risk of failure, especially if aspirations exceed students' actual chances on the labor market, given their set of resources and abilities. This is the case particularly in highly structured education systems (in the less structured context of societies such as the USA, where social climbing is more likely, being overambitious can be helpful to achieve goals [e.g., Heckhausen & Chang, 2009]).

To conclude, our findings show that the AAG is a widespread phenomenon that is not randomly distributed but can be predicted partly from students' sociostructural and individual characteristics. It thus merits closer examination in future research. The present investigation makes an important contribution both to examining the distribution of the occupational AAG and determining the role of different types of possible influences that operate simultaneously on the occupational AAG of non-college-bound students in the context of the highly structured transition system at entry to VET in Germany. Because failure to meet one's own expectations may lead to diminished work motivation and dissatisfaction as well as hamper one's future careers, we submit that the AAG merits closer examination in future research—and may deserve the attention of practitioners and political decision makers.

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## 3.9 Appendices

### 3.9.1 Appendix A

#### Country Context

The German school system is characterized by a high degree of stratification and early tracking. In fourth grade (at age 10), after typically four years of primary school, students are selected into different school types: *Hauptschule* (general secondary school), a “type of school at lower secondary level providing a basic general education [...], usually comprising Grades 5–9” (Secretariat of the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany [KMK], 2019, p. 1); *Realschule* (intermediate secondary school), a “type of school at lower secondary level [...] [providing] a more extensive general education [...], usually comprising Grades 5–10” (KMK, 2019, p. 1); and *Gymnasium* (academically oriented secondary school), a “type of school covering both lower and upper secondary levels (Grades 5–12 or 5–13) [...] providing an in-depth general education aimed at the general higher education entrance qualification” (KMK, 2019, p. 1).

*Hauptschule* graduates may leave the (general) education system after ninth grade (at age 15), *Realschule* graduates leave after 10th grade (at age 16), and graduates from *Gymnasium* after 12th or 13th grade (at age 18 or 19). Whereas graduates from *Gymnasium* are entitled to study at a university or a university of applied sciences (*Fachhochschule*; or to take up vocational education and training [VET]), *Hauptschule* and *Realschule* graduates are eligible only to take up VET (however, *Realschule* graduates with a certain grade point average may attend upper *Gymnasium* level to obtain a higher education entrance qualification). In general, about half of all school leavers in Germany transition to VET; the other half starts tertiary education, or continues general schooling in order to obtain a higher education entrance qualification (Statistisches Bundesamt [Destatis], 2019).

In the context of the German dual training system, which provides initial vocational training before labor market entry (Protsch & Soga, 2016), VET combines an on average 3-year company-based training in a specific occupation or trade with a vocational-school-based education in occupation-related subjects, such as accounting, hygiene, or medical engineering (e.g., Heckhausen & Tomasik, 2002). For example, in some dual training structures, trainees attend vocational school 2 days a week; in others, 2-week periods of in-company training alternate with 2-week periods at a vocational school.

Access to VET itself is highly stratified by school attainment (Protsch & Solga, 2016) because not all VET programs are accessible for all graduates. There are low-skilled occupations, such as baker, landscape gardener, or plumbing and heating installer, that require only a basic school-leaving qualification (*Hauptschulabschluss*). Skilled occupations, such as mechatronics technician, industrial mechanic, or management assistant in wholesale, require an intermediate school-leaving qualification (*Mittlere Reife*). Professional occupations, such as bank clerk, insurance clerk, or IT specialist, require a higher education entrance qualification (*Abitur*). As a consequence, sorting students into different educational trajectories—that is, vocational or academic tracks—as early as age 10 make different options possible in the further life course (Becker, 2019). This results in large differences and social inequalities in labor market opportunities and career prospects, given that upward occupational career mobility is very rare in Germany (Protsch & Solga, 2016).

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## 3.9.2 Appendix B

Table 3.B1: Correlations Between the Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Aspirations														
2 Attained VET position	.42 ***													
3 AAG	.69 ***	-.30 ***												
4 Parental SES	.14 ***	.10 ***	.07 ***											
5 Cultural capital	.13 ***	.06 **	.07 ***	.28 ***										
6 Migration background	.08 ***	.02	.08 ***	-.17 ***	-.16 ***									
7 Female	.24 ***	.25 ***	.05 *	-.11 ***	-.02	.04								
8 Cognitive ability	.04	.05 *	.00	.07 **	.13 ***	-.08 ***	-.10 ***							
9 School grades <sup>a</sup>	.04 *	.07 ***	-.02	-.07 **	.07 ***	-.11 ***	.05 **	.10 ***						
10 Extraversion	.04	.01	.05 *	.06 **	.03	.05 *	-.01	-.07 **	.05 *					
11 Agreeableness	.06 **	.05 **	-.00	-.03	-.01	.03	.13 ***	.01	-.04	-.11 ***				
12 Conscientiousness	.02	.06 **	-.05 *	-.11 ***	-.02	-.00	.18 ***	-.12 ***	-.21 ***	.01	.25 ***			
13 Emotional Stability	.01	-.01	.02	.07 ***	.04	-.02	-.21 ***	.04	-.02	.29 ***	.03	.05 **		
14 Openness	.12 ***	.06 **	.08 ***	.04 *	.12 ***	.07 **	.18 ***	.04	.04 *	.03	.14 ***	.10 ***	.03	
15 Search duration	.06 **	.04 *	.05 *	-.02	-.04 *	.05 *	.09 ***	-.03	.10 ***	-.02	-.03	-.05 *	.05 *	

Note.  $N = 2,478$  ( $N_{\text{parental SES}} = 2,226$ ;  $N_{\text{cultural capital}} = 2,371$ ;  $N_{\text{cognitive ability}} = 2,348$ ;  $N_{\text{school grade}} = 2,463$ ;  $N_{\text{extraversion}} = 2,348$ ;  $N_{\text{agreeableness}} = 2,341$ ;  $N_{\text{conscientiousness}} = 2,368$ ;  $N_{\text{emotional stability}} = 2,360$ ;  $N_{\text{openness}} = 2,366$ ). VET = vocational education and training, AAG = aspiration-attainment gap, SES = socioeconomic status.

<sup>a</sup> Higher values reflect higher grades.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

### 3.9.3 Appendix C

**Table 3.C1:** *Decentiles of the Variables Aspirations, Attained VET Position, and Aspiration–Attainment Gap for Those Who Experienced a Gap*

Variables	10%	20%	30%	40%	50%	60%	70%	80%	90%
Aspirations	32.50	36.92	46.38	51.50	52.72	56.00	67.94	74.00	79.74
Attained VET position	21.64	25.26	28.48	29.16	31.72	36.35	43.19	44.94	52.72
Aspiration–attainment gap	–3.00	–5.00	–8.00	–12.00	–16.00	–23.00	–28.00	–33.00	–43.00

*Note.*  $N = 1,138$ . VET = vocational education and training.

## 3.9.4 Appendix D

**Table 3.D1:** *Unstandardized Regression Coefficients for Predicting the Risk of Experiencing an AAG (Model Part I)*

	Total effects			Direct effects			Indirect effects through aspirations		
	AME	95% CI	p	AME	95% CI	p	AME	95% CI	p
Aspirations				<b>.015</b>	[.014, .016]	<.001			
Sociostructural characteristics									
Parental SES	.001	[.000, .002]	.191	-.001	[-.002, .000]	.014	<b>.002</b>	[.001, .003]	<.001
Cultural capital	<b>.024</b>	[.009, .040]	.003	.007	[-.006, .021]	.301	<b>.017</b>	[.009, .025]	<.001
First-generation migrant*	<b>.136</b>	[.040, .232]	.005	.054	[-.028, .137]	.199	<b>.082</b>	[.036, .131]	.001
Second-generation migrant*	<b>.096</b>	[.034, .158]	.002	.023	[-.032, .075]	.410	<b>.074</b>	[.045, .104]	<.001
Female*	.011	[-.030, .053]	.600	-.120	[-.156, -.083]	<.001	<b>.131</b>	[.112, .152]	<.001
Cognitive ability and school grades									
Cognitive ability	-.003	[-.012, .006]	.500	-.007	[-.014, .000]	.066	.004	[.000, .008]	.070
School grades <sup>a</sup>	-.038	[-.072, -.004]	.029	-.057	[-.087, -.027]	<.001	<b>.019</b>	[.004, .035]	.014
Personality traits									
Extraversion	.016	[-.008, .040]	.183	.011	[-.012, .033]	.334	.005	[-.006, .017]	.365
Agreeableness	-.021	[-.050, .009]	.172	-.030	[-.056, -.003]	.028	.009	[-.006, .025]	.246
Conscientiousness	-.019	[-.045, .009]	.176	-.009	[-.031, .014]	.455	-.010	[-.022, .002]	.104
Emotional Stability	.014	[-.014, .041]	.305	.001	[-.024, .024]	.959	<b>.014</b>	[.002, .027]	.029
Openness	<b>.029</b>	[.005, .052]	.015	.017	[-.004, .038]	.119	<b>.012</b>	[.001, .022]	.031
Search duration				<b>.005</b>	[.002, .007]	.002			

*Note.*  $N = 2,478$  ( $n = 1,138$  for  $AAG < 0$ ;  $n = 1,340$  for no AAG). AME = average marginal effects, AAG = aspiration–attainment gap, CI = confidence interval, SES = socioeconomic status. Coefficients significant at the  $p < .05$  level are in bold type.

**Table 3.D2:** Unstandardized Regression Coefficients for Predicting the Size of the AAG of Those Who Experienced a Gap (Model Part II)

	Total effects			Direct effects			Indirect effects through aspirations		
	<i>b</i>	95% CI	<i>p</i>	<i>b</i>	95% CI	<i>p</i>	<i>b</i>	95% CI	<i>p</i>
Aspirations				<b>0.557</b>	[0.520, 0.594]	<.001			
Sociostructural characteristics									
Parental SES	<b>0.058</b>	[0.014, 0.102]	.010	−0.020	[−0.055, 0.015]	.266	<b>0.078</b>	[0.055, 0.102]	<.001
Cultural capital	0.237	[−0.370, 0.816]	.435	−0.409	[−0.917, 0.087]	.110	<b>0.646</b>	[0.345, 0.952]	<.001
First-generation migrant*	1.838	[−1.550, 5.300]	.287	−1.245	[−4.240, 1.913]	.426	<b>3.083</b>	[1.362, 4.856]	<.001
Second-generation migrant*	1.875	[−0.047, 3.835]	.062	−0.895	[−2.606, 0.866]	.312	<b>2.770</b>	[1.682, 3.920]	<.001
Female*	<b>3.668</b>	[2.176, 5.212]	<.001	−1.261	[−2.678, 0.181]	.083	<b>4.930</b>	[4.241, 5.645]	<.001
Cognitive ability and school grades									
Cognitive ability	−0.039	[−0.362, 0.298]	.817	−0.186	[−0.467, 0.116]	.210	0.147	[−0.016, 0.307]	.073
School grades <sup>a</sup>	1.054	[−0.128, 2.223]	.081	0.324	[−0.727, 1.416]	.549	<b>0.730</b>	[0.138, 1.316]	.014
Personality traits									
Extraversion	0.109	[−0.781, 0.986]	.808	−0.094	[−0.815, 0.629]	.800	0.202	[−0.230, 0.656]	.367
Agreeableness	0.879	[−0.303, 2.084]	.150	0.533	[−0.486, 1.560]	.307	0.346	[−0.235, 0.941]	.248
Conscientiousness	<b>−1.196</b>	[−2.140, −0.247]	.013	−0.819	[−1.677, 0.017]	.058	−0.377	[−0.834, 0.081]	.108
Emotional Stability	−0.297	[−1.151, 0.589]	.508	<b>−0.817</b>	[−1.560, −0.035]	.037	<b>0.520</b>	[0.059, 0.992]	.027
Openness	0.195	[−0.614, 0.967]	.631	−0.249	[−1.017, 0.474]	.511	<b>0.444</b>	[0.040, 0.849]	.032
Search duration				<b>−0.138</b>	[−0.226, −0.042]	.003			

Note. *N* = 2,478 (*n* = 1,138 for AAG < 0; *n* = 1,340 for no AAG). AAG = aspiration–attainment gap, CI = confidence interval, SES = socioeconomic status. Coefficients significant at the *p* < .05 level are in bold type.



### 3.9.5 Appendix E

**Table 3.E1:** *Regression Coefficients for the Mediator Level of Aspirations Regressed on Sociostructural Characteristics, Cognitive Ability, School Grades, and Personality Traits*

	$b_1$	95% CI	$b_2$	95% CI	$p$
Sociostructural characteristics					
Parental SES	<b>0.141</b>	[0.100, 0.181]	<b>.153</b>	[.109, .197]	<.001
Cultural capital	<b>1.159</b>	[0.622, 1.709]	<b>.094</b>	[.050, .138]	<.001
First-generation migrant*	<b>5.536</b>	[2.447, 8.787]	<b>.331</b>	[.146, .525]	.001
Second-generation migrant*	<b>4.974</b>	[3.030, 6.952]	<b>.297</b>	[.181, .415]	<.001
Female*	<b>8.852</b>	[7.638, 10.032]	<b>.529</b>	[.456, .599]	<.001
Cognitive ability and school grades					
Cognitive ability <sup>a</sup>	0.264	[-0.030, 0.544]	.037	[-.004, .076]	.071
School grades	<b>1.311</b>	[0.237, 2.348]	<b>.047</b>	[.009, .084]	.014
Personality traits					
Extraversion	0.364	[-0.425, 1.164]	.019	[-.022, .061]	.364
Agreeableness	0.621	[-0.427, 1.676]	.024	[-.017, .066]	.246
Conscientiousness	-0.677	[-1.489, 0.143]	-.034	[-.076, .007]	.107
Emotional Stability	<b>0.934</b>	[0.103, 1.786]	<b>.047</b>	[.005, .090]	.028
Openness	<b>0.796</b>	[0.074, 1.510]	<b>.045</b>	[.004, .085]	.030

*Note.*  $N = 2,478$  ( $n = 1,138$  for AAG [aspiration–attainment gap] < 0;  $n = 1,340$  for no AAG). CI = confidence interval, SES = socioeconomic status. Coefficients significant at the  $p < .05$  level are in bold type. In the case of  $b_2$  coefficients, continuous coefficients are standardized with regard to X (the independent variables) but not Y (the dependent variable, i.e., the AAG). Variables marked with an asterisk (\*) are not standardized.

<sup>a</sup> Higher values reflect higher grades.



## **4 Study 3:**

# **Aspiration–Attainment Gaps Predict Adolescents’ Subjective Well-Being After Transition to Vocational Education and Training in Germany**

This study is currently under review:

Nießen, D., Wicht, A., & Lechner, C. M. (2021). *Aspiration–attainment gaps predict adolescents’ subjective well-being after transition to vocational education and training in Germany* [Manuscript submitted for publication]. GESIS – Leibniz Institute for the Social Sciences.



## 4.1 Abstract

An occupational aspiration–attainment gap (AAG) is defined as a discrepancy between the socioeconomic status (SES) of the aspired and the attained occupation. We investigated how experiencing an occupational AAG after transition to vocational education and training (VET) affects three domains of subjective well-being (SWB)—namely, general life satisfaction, job satisfaction, and income satisfaction—among adolescents in Germany. Using longitudinal data from the German Socio-Economic Panel (SOEP), we could track respondents' SWB across their transition to VET and over a period of 1 to 2 years after VET entry. Results from latent growth curve models revealed that both under- and overachievement of aspirations reduced in particular initial levels of SWB (especially job satisfaction and income satisfaction) after VET entry. Strong discrepancies between aspirations and attainment ( $AAG \leq |5|$  ISEI [International Socio-Economic Index of Occupational Status] score points) in particular led to higher dissatisfaction. Individuals with an AAG tended to experience a slightly larger increase in SWB during VET than those who met their aspirations. Overall, our results suggest that the decisive factor for adolescents' SWB is not the SES of the VET position they attain, but rather whether that position is the exact type of position to which they aspired, irrespective of whether the status of that occupation is lower or higher than the one they aspired to.

## 4.2 Introduction

The occupational *aspiration–attainment gap* (AAG) refers to the discrepancy between the socio-economic status (SES) of occupational aspirations and attainment. Three groups of individuals can be distinguished: (a) those who fall short of their occupational aspirations, and experience a negative AAG (underachievement); (b) those who realize their occupational aspirations exactly; and (c) those who surpass their occupational aspirations, and experience a positive AAG (overachievement). AAGs are a widespread but unequally distributed phenomenon among adolescents in vocational education and training (VET) in Germany (e.g., Nießen et al., 2021). Previous studies have shown that, when accessing VET, young people have to make several compromises—for example, in terms of qualification level, SES, career opportunities, job stability, and gender typicality (e.g., Ahrens et al., 2021b; Kleinert & Scheels, 2020; Nießen et al., 2021).

But what are the *consequences* of experiencing an AAG? Although several scholars have argued that experiencing an AAG—at an early career stage—is likely to have unfavorable long-term consequences for career development (e.g., Nießen et al., 2021; Tomasik et al., 2009), only a few studies have investigated the extent to which occupational AAGs have negative consequences for individuals' subjective well-being (SWB; e.g., Carr, 1997; Hardie, 2014). The consequences of occupational AAGs for SWB are relevant both for individuals and for employers for two reasons. First, SWB is an important outcome in its own right. Second, SWB predicts, for example, work motivation (e.g., Ton & Hansen, 2001), goal engagement (e.g., Luhman & Hennecke, 2017), and goal striving (e.g., Haase et al., 2012). Low SWB is therefore a likely precursor of job dropout or occupational change (e.g., Giver et al., 2010) and other potentially detrimental career outcomes. Medici et al. (2020), for example, showed that individuals in Switzerland with higher VET satisfaction in the final phase of VET were more likely to work in their trained occupations, thus underscoring the importance of early formative experiences during VET for later, often costly, undesired job turnover.

In addition to the scant evidence on the link between AAGs and SWB, little is known about the development of SWB in the event of an AAG. Studies have pointed to adaptive processes that occur even in the face of severe negative events and circumstances. For example, a meta-analysis conducted by Luhmann et al. (2012) found that a few years after losing their jobs, many people reached pre-unemployment levels of SWB. Similar patterns of adaptation have been found for non-work stressors such as filial bereavement (e.g., Leopold & Lechner,

2015). However, longitudinal studies tracking SWB over time among individuals who have experienced an AAG are absent from the literature.

In the present study, we investigated the consequences of experiencing an AAG for SWB during the course of VET. Our study was guided by two research questions: (a) Does an occupational AAG lower young people's SWB when starting VET? (b) If so, does the SWB of apprentices decrease, increase, or remain the same over the course of VET as a function of this AAG? To answer these questions, we used representative longitudinal data from Germany tracking SWB among young people in VET for a period of 2 years.

## 4.3 Theoretical Background

### 4.3.1 Consequences of Occupational AAGs for SWB and for Changes in SWB Over Time

There are several relevant theories on the consequences of discrepancies between desired and actual states. They converge in the prediction that discrepancies between occupational aspirations and attainment will impair the SWB of young people in VET, whereas realizing or exceeding these aspirations will enhance SWB. The *level of aspiration theory* (e.g., Starbuck, 1963) assumes that an individual's level of aspirations serves as a reference point for their feelings of success and failure. Consequently, attainment that surpasses aspirations is perceived as success, whereas attainment that does not meet aspirations is perceived as failure. Similarly, *multiple discrepancies theory* (Michalos, 1985) asserts that SWB is a function of discrepancies (gaps) between what individuals have (attainment) and what they expected to have in the past or want for the future (aspirations). *Self-discrepancy theory* (Higgins, 1987) states that negative emotions depend on the type and magnitude of subjectively perceived discrepancies between the actual/own self-state (i.e., attainment, self-concept) and the ideal self-state (i.e., aspirations, wishes), or between the actual/own self-state and the ought self-state (i.e., duties, responsibilities). It posits that actual–ideal discrepancies signify the *absence* of positive outcomes (i.e., the non-achievement of expectations), and are associated with feelings such as dissatisfaction and disappointment, whereas actual–ought discrepancies signify the *presence* of negative outcomes (i.e., the expectation of punishment), and are associated with feelings such as fear and restlessness.

Although these theories agree that discrepancies are generally detrimental to SWB, they do not explicitly consider changes in SWB over time while experiencing an (enduring) dis-

crepancy. Individuals tend to return to a relatively stable baseline level of happiness after positive or negative life experiences—a phenomenon captured by the metaphor *hedonic treadmill* coined by Brickman and Campbell (1971), and also known as *hedonic adaptation*. Although these processes of adaptation vary among and within individuals (Diener et al., 2006), it is conceivable that the initially lower level of SWB in young people who have experienced an occupational AAG gradually returns to a baseline level similar to that of their peers who have not experienced an AAG.

#### **4.3.2 Previous Research on the Consequences of Occupational AAGs for SWB**

Little research has addressed the potential impact of occupational AAGs on SWB. In line with the theoretical perspectives discussed above, the few existing studies suggest that experiencing an occupational AAG leads to lower job satisfaction (Hardie, 2014), lower SWB (Carr, 1997), lower enjoyment of VET (Beckmann et al., 2021), more depressive symptoms (Carr, 1997; Hardie, 2014), and a decreased likelihood that individuals perceive themselves as “very successful” in their working lives (Carr, 1997).

Notably, evidence on the consequences of overachievement (i.e., attainment that exceeds aspirations) is contradictory. In a study on the consequences of unrealized occupational goals in the transition to adulthood conducted by Hardie (2014), overachievement was found to be associated with higher job satisfaction in one sample and with lower job satisfaction in another. A study examining the impact of occupational AAGs on women’s mental health (i.e., depression, psychological well-being, and purpose in life) at midlife (Carr, 1997) found that there was no difference in mental health between those who had surpassed and those who had met their aspirations. Moreover, women who experienced a large positive occupational AAG were *less* likely to perceive themselves as “very successful” in their working lives than those who met their aspirations (Carr, 1997). In line with Kahneman and Tversky’s (1979) classic dictum from prospect theory, “losses loom larger than gains” (p. 279), these inconsistent findings suggest that underachievement (i.e., experiencing a negative AAG) is more relevant to SWB than overachievement.

In addition to these few studies addressing the consequences of occupational AAGs for SWB, several studies have investigated *educational* AAGs (i.e., discrepancies between aspired and attained levels of education). Similar to the occupational AAG studies, Paat (2016) found that educational AAGs were linked to higher depressive symptoms among Mexican



immigrant youth in the USA. Another study found that university-educated Canadians who worked in jobs for which they were overqualified had a significant risk of decline in self-rated health over a 4-year period (Smith & Frank, 2005). By contrast, among secondary- or less-educated respondents, differences in occupational attainment were unrelated to differences in the risk of decline in self-rated health (Smith & Frank, 2005). For the USA, Reynolds and Baird (2010) initially found that young adults who experienced an educational AAG had a greater risk of experiencing symptoms of depression—but only at the lowest level of aspirations (i.e., among those who failed to achieve a high school diploma). However, this apparent negative effect of an AAG on mental health disappeared when differences in depressive symptoms associated with educational attainment were additionally controlled for (Reynolds & Baird, 2010). Likewise, a recent study of German adolescents did not find differences in life satisfaction between those who experienced an educational AAG and those who did not (Siembab & Stawarz, 2019).

However, these studies investigated the consequences of an educational AAG and/or used samples from North America, mostly from the USA—sometimes comprising only women (Carr, 1997) or immigrants (Paat, 2016)—collected several decades ago (assessment of aspirations between 1975 and 1990). Moreover, they focused mostly on a different phase of life: aspirations at age 35 and attainment and dependent variables at age 53 (Carr, 1997); aspirations at age 14–22 and attainment and dependent variables at age 27–35 (Hardie, 2014). Thus, the findings of these few studies are not readily generalizable to the potential consequences for SWB of an early career AAG in the highly structured German school and VET system. In addition, these studies were mostly cross-sectional and did not investigate how SWB developed over time as a function of an AAG (for exceptions, see Siembab & Stawarz, 2019; Smith & Frank, 2005). Some of the studies also looked at quite different outcomes (e.g., [mental] health rather than SWB) or used only global measures of SWB. Because people may evaluate different domains of life differently, a comprehensive view of SWB should go beyond a global evaluation (Ruggeri et al., 2020) and examine individual domains of the construct. Consequently, further research is needed to close this gap.

### **4.3.3 The Present Study**

Little is known about the impact of experiencing an occupational AAG on adolescents' SWB. The present study aimed to close this gap by tracing the development of SWB after the transition to VET among young people in Germany. For this purpose, we used representative longitudinal data from the Socio-Economic Panel on apprentices who had started their first VET

position leading to a full vocational qualification. The data allowed us to track the SWB of adolescents over a period of 2 years (i.e., from VET entry until 2 years after VET entry).

VET is an integral part of Germany's highly structured and stratified education system. Students typically enter VET after completing ninth or 10th grade at a vocationally oriented secondary school track, although other pathways are possible. The dual VET system provides initial vocational training before labor market entry (Protsch & Solga, 2016). For an average of 3 years, apprentices learn the practical skills of a specific occupation at a company (on-the-job training) and, in parallel, take theoretical occupation-related and general subjects at a part-time vocational school (schooling; e.g., Heckhausen & Tomasik, 2002). Different VET positions (i.e., low-skilled occupations such as baker, skilled occupations such as mechatronics technician, professional occupations such as bank clerk) require different school-leaving qualifications, which are usually attained after different years of schooling. Because the VET system in Germany is vertically stratified, not all VET positions are equally accessible (Protsch & Solga, 2016). As the transition from school to VET and from VET to the labor market is highly standardized, young people who have completed a certain VET program can typically only take up a job in that particular occupational field. Thus, because occupational upward mobility is very rare in Germany, a VET-related AAG—if not closed by switching to a different VET position—may often persist in later working life (Protsch & Solga, 2016). This renders the German VET system an interesting case to study the consequences of occupational AAGs for SWB.

We considered three domains of SWB that are particularly relevant with regard to occupational attainment and further career development: general life satisfaction, job satisfaction, and income satisfaction. Although related, these three domains need not necessarily coincide. Recent studies (i.e., published after the year 2000) have reported correlations of similar magnitude between general life satisfaction and job satisfaction (e.g.,  $r = .30$  [Rode, 2004];  $r = .40$  [Rojas, 2007]), and between general life and income satisfaction (e.g.,  $r = .35$  [Zagórski, 2011];  $r = .41$  [Rojas, 2007]). Reported correlations between job satisfaction and income satisfaction have been generally somewhat higher (e.g.,  $r = .52$  [Rojas, 2007];  $r = .60$  [Sweet et al., 2006]). These findings suggest that when evaluating satisfaction with their lives in general, their jobs, and their income, individuals selectively consider information. Hence, examining the three domains of SWB separately provides a more nuanced picture of the consequences of an occupational AAG for SWB than considering only one domain or aggregating the three domains.

In the present study, we aimed to answer the following research questions: (a) Does experiencing an AAG impair initial levels of three domains of SWB (general life satisfaction, job satisfaction, income satisfaction) among young people when starting VET in Germany (i.e., the intercept of SWB)? (b) Does the SWB of apprentices decrease, increase, or remain the same over the course of VET as a function of the AAG (i.e., the slope of SWB)? We traced SWB over time (i.e., when starting VET and after 1 year and 2 years in VET), thereby enabling us to examine whether adolescents adapt to an AAG over time, and whether patterns of adaptation differ across individuals. To answer these questions, we analyzed two binary contrasts: underachievement versus perfect match, and overachievement versus perfect match.

We preregistered our hypotheses on a project web page on the Open Science Framework (OSF) website.<sup>9</sup> Our hypotheses relating to the initial levels of SWB built on aspiration theory (Starbuck, 1963), multiple discrepancies theory (Michalos, 1985), and self-discrepancy theory (Higgins, 1987), which postulate that unrealized expectations are associated with lower SWB:

*Hypothesis 1a:* Underachievement compared to a perfect match between aspirations and attainment predicts lower initial levels of SWB.

*Hypothesis 1b:* Especially a large AAG (discrepancy between attainment and aspirations  $\leq |5|$ ) predicts lower initial levels of SWB.

Our hypotheses relating to changes in SWB over time were based on Brickman and Campbell's (1971) concept of the hedonic treadmill—also known as the process of hedonic adaptation. We assumed that initially lower levels of SWB in young people who experienced an AAG gradually return to a baseline level similar to that of their peers who did not experience an AAG:

*Hypothesis 2a:* Underachievement compared to a perfect match between aspirations and attainment predicts a larger positive change in SWB over the course of VET.

*Hypothesis 2b:* A large AAG (discrepancy between attainment and aspirations  $\leq |5|$ ) predicts a larger positive change in SWB.

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<sup>9</sup> See <https://doi.org/10.17605/OSF.IO/VZK92>.

In addition to testing our preregistered hypotheses, we conducted exploratory analyses concerning: (a) associations between the intercept (defined as the level of SWB at the initial observation time when starting VET) and the slope of SWB; (b) similarities and differences in the AAG–SWB associations across different indicators of SWB; and (c) the association between a positive AAG (i.e., overachievement) and SWB. Because previous findings regarding overachievement have been inconclusive, we refrained from formulating specific expectations in this regard. In additional analyses, and in an exploratory fashion, we defined the level of SWB reached at the last observation during VET as the intercept in order to find out whether experiencing an AAG is also a direct predictor of SWB in the final phase of VET.

When testing the potential effects of the AAG on SWB, we controlled for a set of possible confounding variables that prior research has found to be related to both the AAG and SWB, and that temporally precede the measurement of the AAG: the Big Five personality traits, sociostructural characteristics (parental SES, migration background, sex), year of entering VET, and VET entry before first interview. In Appendix A, we present a summary of research findings regarding the association of these control variables with the AAG and SWB that highlights the need to consider these variables as potential confounders of the AAG–SWB interface. We expected our hypotheses to be confirmed both with and without control variables.

## **4.4 Material and Methods**

### **4.4.1 Dataset and Sample Description**

To answer the above-mentioned research questions, we used data from the German Socio-Economic Panel (SOEP; Goebel et al., 2019; Version 35, <https://doi.org/10.5684/soep-core.v35>). Conducted annually since 1984, SOEP is an ongoing longitudinal survey of a representative sample now comprising almost 77,000 participants aged 16/17 years and older residing in over 40,000 private households in Germany. Because it covers a wide range of topics, such as occupational biographies, employment, earnings, health, and satisfaction indicators, SOEP is ideally suited to analyze consequences of the AAG for SWB.

The survey is refreshed annually with new 16/17-year-old adolescents from the surveyed households. At panel entry, these respondents complete the initial youth questionnaire, which is regularly updated and has included all variables relevant for our analyses since 2006, thereby resulting in a gross sample size of  $N = 6,073$ . Thus, the first observations for respond-

ents in our sample came from 13 different survey years (i.e., from 2006 to the last available survey year at the time the analyses were carried out, namely, 2018), and all other relevant variables and events such as school graduation also took place at different observation times. We combined these different observation times per respondent for our analyses.

The number of available observations also varied among individuals as well as by outcome: For example, information on satisfaction with income was available for 10 survey years for some individuals and for only 2 survey years for others. For this reason, and consistent with our focus on SWB during VET, we considered only those survey years in which respondents were in VET. The observed VET episodes lasted at most 3 years for 95% of all respondents ( $M = 1.40^{10}$ ,  $SD = 1.26$ ,  $\text{Min.} = 0$ ,  $\text{Max.} = 5$ ). As mentioned in the preregistration on the OSF website, we originally intended to cover the period between entry into VET and a maximum of 3 years after entry into VET. However, because the number of valid cases for SWB values 3 years after VET entry was too small (about 50) due either to VET dropout or panel dropout or to missing information, our analyses of SWB could cover only the period between VET entry and a maximum of 2 years after VET entry. The last column in Table 4.1 shows the number of persons for whom information was available for each outcome and the number of years during VET for which information was available.

Given the specific longitudinal data structure, we drew on data for all variables between 2006 and 2018, depending on the phase that the respondents were in: Information on personality traits, sociostructural characteristics, and occupational aspirations was collected with the initial youth questionnaire when the respondents were aged 16/17 years and most of them were still at school, and hence before entry into VET. We gathered information on the VET position attained and the year of entering VET for the time when respondents entered VET and after school graduation ( $t_0$ ). We gathered information on the consequences of the AAG for SWB for the year of VET entry ( $t_0$ ) and 1–2 years after VET entry ( $t_1$ – $t_2$ ). We gathered information on general life satisfaction additionally for the year before VET entry ( $t_{-1}$ ). Table 4.1 displays the descriptive statistics of all measures in the present sample. Appendix B displays the correlations between SWB and all other variables.

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<sup>10</sup> The average observed VET duration did not necessarily correspond to the actual VET duration either because of missing data or because of survey dropout from a certain point in time.

**Table 4.1:** *Descriptive Statistics of all Measures*

Continuous variables	Min.	Max.	<i>M</i>	<i>SD</i>	Valid <i>N</i>	Missings
General life satisfaction						
1 year before VET	1	10	7.62	1.59	1,141	395
When starting VET	0	10	7.73	1.60	1,089	447
After 1 year in VET	0	10	7.58	1.55	815	721
After 2 years in VET	0	10	7.37	1.63	437	1,099
Job satisfaction						
When starting VET	0	10	7.92	1.87	703	833
After 1 year in VET	0	10	7.53	2.04	784	752
After 2 years in VET	0	10	7.27	2.07	423	1,113
Income satisfaction						
When starting VET	0	10	5.98	2.68	772	764
After 1 year in VET	0	10	6.05	2.54	807	729
After 2 years in VET	0	10	5.74	2.46	435	1,101
AAG-related variables						
Aspirations	16	88	43.71	14.66	1,265	271
Attainment	16	60	39.56	10.45	997	539
Aspiration–attainment gap	32	–63	–4.26	12.25	726	810
Big Five <sup>a</sup>						
Extraversion	1.0	7.0	4.90	1.25	1,516	20
Agreeableness	1.0	7.0	5.35	0.93	1,519	17
Conscientiousness	1.0	7.0	4.95	1.10	1,521	15
Emotional Stability	1.0	7.0	4.05	1.14	1,524	12
Openness	1.5	7.0	4.64	1.00	1,506	30
Parental SES	11.74	88.31	42.44	18.63	683	853
Process time in months between						
VET entry and <i>t</i> <sub>0</sub> for						
General life satisfaction	0	10	5.15	3.01	1,089	447
Job satisfaction	0	10	6.15	2.71	703	833
Income satisfaction	0	10	5.98	2.80	772	764
VET entry and <i>t</i> <sub>1</sub> for						
General life satisfaction	9	26	17.04	3.41	815	721
Job satisfaction	9	26	17.09	3.41	784	752
Income satisfaction	9	26	17.04	3.41	807	729
VET entry and <i>t</i> <sub>2</sub> for						
General life satisfaction	18	39	28.79	3.52	437	1,099
Job satisfaction	18	39	28.77	3.50	423	1,113
Income satisfaction	18	39	28.78	3.53	435	1,101

(continued)

**Table 4.1** (continued)

Categorical variables	% (incl. missings)				N	Missings
Dummy AAGs (0)	52.7					810
Perfect match (AAG = 0)	-	-	24.8	-	380	-
Underachievement (AAG < 0)	-	-	15.6	-	240	-
Overachievement (AAG > 0)	-	-	6.9	-	106	-
Dummy AAGs (+/-5)	52.7					810
Perfect match (AAG ≤  5 )	-	-	30.0	-	461	-
Underachievement (AAG < -5)	-	-	13.0	-	199	-
Overachievement (AAG > 5)	-	-	4.3	-	66	-
Migration background						0
No	-	-	81.0	-	1,245	-
Yes	-	-	19.0	-	291	-
Sex						0
Male	-	-	54.8	-	841	-
Female	-	-	45.2	-	695	-
Year of entering VET						0
Pre-economic crisis (2006–2009)	-	-	21.3	-	327	-
Post-economic crisis recovery (2010–2013)	-	-	33.8	-	520	-
Normalcy (2014–2018)	-	-	44.9	-	689	-
VET entry before first interview						0
After first interview	-	-	76.7	-	1,178	-
Before first interview	-	-	23.3	-	358	-

*Note.* VET = vocational education and training, AAG = aspiration–attainment gap, SES = socioeconomic status.

<sup>a</sup> We recoded the negatively keyed items ( $y_{\text{recoded}} = 8 - y_{\text{original}}$ ) before computing the unweighted mean score of the Big Five dimensions.

We excluded (a) respondents whose last observed episode was a school episode—that is, who dropped out of the panel after school graduation—(leading to  $N = 5,496$ ); (b) respondents for whom no information on the time of school graduation was available (leading to  $N = 4,104$ ); (c) respondents who never entered VET (leading to  $N = 1,928$ ); (d) respondents with inconsistent data (e.g., the VET episode began prior to school graduation; leading to  $N = 1,858$ ); (e) respondents who completed VET before the first survey (leading to  $N = 1,804$ ); and (f) respondents for whom neither information on aspirations, attainment, nor on a single dependent variable was available (resulting in a total  $N$  of 1,536 respondents).

The average age of respondents at the time of school graduation was 16.97 years ( $SD = 1.43$ , Min. = 14, Max. = 22). Respondents graduated with different school-leaving qualifications: (a) basic school-leaving qualification (29.6%; German: *Hauptschulabschluss*; International Standard Classification of Education 1997 [ISCED-97] Level 2B); (b) intermediate school-leaving qualification (46.0%; German: *Mittlere Reife*; ISCED-97 Level 2A); (c) entrance qualification for a university of applied sciences (6.7%; German: *Fachhochschul-*

*reife*; ISCED-97 Level 3A); and (d) general higher education entrance qualification (17.73%, German: *Abitur*; ISCED-97 Level 3A; for an overview of the ISCED-97 levels in the German education system, see Schneider, 2008).

## 4.4.2 Measures

### 4.4.2.1 Main Predictor: Aspiration–Attainment Gap (AAG)

To operationalize the AAG, we calculated the difference score between the SES of the occupation in which an apprenticeship was obtained after VET entry and the SES of the occupation aspired to before VET entry. SES was measured in terms of the ISEI scores (International Socio-Economic Index of Occupational Status; Ganzeboom et al., 1992) associated with the corresponding occupation. As a metric variable, the AAG can have a negative value (aspirations higher than attainment;  $AAG < 0$ ; i.e., underachievement), a positive value (aspirations lower than attainment;  $AAG > 0$ ; i.e., overachievement), or the value zero (aspirations equal to attainment;  $AAG = 0$ ). We computed two dummy variables, and used them to compare, first, *underachievement* (1) and, second, *overachievement* (2) with the reference category *perfect match* (0). Besides the dummies with a zero threshold (i.e., underachievement:  $AAG < 0$ , overachievement:  $AAG > 0$ , perfect match:  $AAG = 0$ ), we computed two further dummy AAGs with the threshold of  $|5|$ —that is, AAG values between  $-5$  and  $+5$  were not assigned to underachievement or overachievement but to the category perfect match. We compared the effects of these two different AAG thresholds on SWB in order to find out whether only a certain magnitude of AAG affects SWB.<sup>11</sup>

In SOEP, occupational aspirations are measured in two steps. At the age of 16/17, the respondents are asked whether they had an occupational aspiration: “Do you already know what occupation you want to take up?” (our literal translation of “Wissen Sie schon, welchen Beruf Sie ergreifen möchten”; for the freer SOEP translation [“Do (you) have a career aspiration?”], see SOEP Group, 2020b, p. 24). If this question is answered in the affirmative, the aspired occupation is measured with the open question “What kind of occupation is that? Please state as exact[ly] as possible.” (SOEP Group, 2020b, p. 24). Occupational attainment is assessed annually with the open question “What is your current position/occupation? Please

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<sup>11</sup> Note that we could not investigate further thresholds, for example, of  $|10|$  because the number of valid cases would have become too small.



state the exact title in German. [...] If you are an apprentice or in vocational training, please state the occupation for which you were trained.” (SOEP Group, 2020a, p. 22).

The answers are coded into various standard occupation classification schemes. As a typical measure of SES, and consistent with some earlier studies (e.g., Nießen et al., 2021), we decided to use ISEI scores. ISEI takes into account the educational level that a specific occupation requires and the income of that occupation (Züll, 2016). Scores range from 11.56 (*low*), representing gardeners, to 88.96 (*high*), representing judges.

If respondents’ attainment values represented occupations that cannot be attained without tertiary education (ISEI scores above 64), we set the value on this variable to “missing.” We presumed that these improbable attainment values were due to either completion (e.g., inconsistent response behavior) or coding errors. If there was a missing value for attainment when starting a VET position, we chose the attainment value from the year after VET entry and controlled for the duration of the VET episode—that is, we filled attainment values only if we could be certain that respondents had not switched to a different VET position or to employment. We continued this procedure if there were also missing values for the year after entry into VET, and so forth, controlling each time for the duration of the VET episode.

#### 4.4.2.2 Dependent Variables

Our focus was on the consequences of the AAG for respondents’ SWB. We considered these consequences for three domains of SWB (general life satisfaction, job satisfaction, and income satisfaction), which although correlated to a certain extent are independent of each other (for more information, see Appendix C).

In SOEP, current general life satisfaction, job satisfaction, and income satisfaction are surveyed annually with the questions “How satisfied are you with your life, all things considered?” (SOEP Group, 2020a, p. 73); “How satisfied are you with your job?” (SOEP Group, 2020a, pp. 4–5); and “How satisfied are you with your personal income?” (SOEP Group, 2020a, pp. 4–5) on a response scale ranging from 0 (*completely dissatisfied*) to 10 (*completely satisfied*). As Appendix B shows, although the three satisfaction domains are correlated to some extent ( $.30 \leq r \leq .36$ ) at the same observation time after VET entry, they are not interchangeable measures.

In the present study, we used information on the satisfaction variables from the year that respondents entered VET until up to 2 years after VET entry. When doing so, we controlled for the duration of the VET episode, and we used information on, for example, job satisfaction after 2 years in VET only if we could be certain that respondents had not switched to a

different VET position or to employment when job satisfaction was assessed. It is noteworthy that there were a substantial number of missing values especially for the job satisfaction and income satisfaction variables at the time when starting a VET position (see Table 4.1). This was due either to the fact that the respondents did not provide information on satisfaction (i.e., item missingness) or that respondents' VET episode began in the year of panel entry, be it before the survey or after the survey (so that the question about job satisfaction and income satisfaction was not asked). Job satisfaction and income satisfaction are not surveyed in the initial youth questionnaire (SOEP Group, 2020b) but rather in the subsequent questionnaire administered to each eligible member of the household, which respondents receive for the first time 1 year after panel entry (SOEP Group, 2020a).

#### 4.4.2.3 Time-Invariant Control Variables

We included the measures described below in the analyses as potential confounding variables for the AAG and its consequences. All these variables were measured prior to entry into VET.

**Big Five Personality Traits:** Since 2006, the 15-item Big Five Inventory-SOEP (BFI-S; Schupp & Gerlitz, 2014) and one additional item for Openness have been used to measure the Big Five personality traits in all 16/17-year-olds when they complete the youth questionnaire for the first time. The dimensions Extraversion, Agreeableness, Conscientiousness, and Emotional Stability are assessed with three items each, whereas Openness is assessed with four items in order to capture this dimension more broadly. The items are answered using a 7-point rating scale that ranges from 1 (*strongly disagree*) to 7 (*strongly agree*). BFI-S has satisfactory psychometric properties (e.g., Schupp & Gerlitz, 2014). In the present study, the internal consistencies of the dimensions ranged between Cronbach's  $\alpha = .45$  (Agreeableness) and  $.72$  (Extraversion), which can be deemed sufficient for short scales (e.g., Aiken & Groth-Marnat, 2006). We used each respondent's first available Big Five scores before they entered VET.

**Sociostructural Characteristics:** To assess respondents' sociostructural characteristics, we used parental SES, migration background, and sex. In SOEP, parental SES is assessed with the open question "What [is your father's/mother's position/occupation or what] was your father's/mother's last occupation?" (SOEP Group, 2020b, p. 36). The answers are coded into standard occupational classification schemes, such as the International Standard Classification of Occupations (ISCO; International Labour Office, 1990), ISEI (Ganzeboom et al., 1992), and the Standard International Occupational Prestige Scale (SIOPS; Ganzeboom & Treiman, 2003; Treiman, 1977). To keep the classification between parental SES and occupa-

tional aspirations equivalent, we used ISEI scores. In cases where the mother's and father's ISEI scores differed, we used the higher score. We coded migration background as 0 (*no*) versus 1 (*yes*) based on information about the respondent's country of birth and citizenship. The sex of the respondent was coded as 0 (*male*) or 1 (*female*).

**Year of VET Entry:** The year of entering VET varied among respondents and ranged between 2006 and 2018. This variable was included in the analyses to compensate for seasonal effects (e.g., of the economy or the labor market). For this purpose, we combined between 4 and 5 sequential years in order to represent three different phases: 2006–2009 (pre-economic crisis), 2010–2013 (post-economic crisis recovery), and 2014–2018 (normalcy). We tested two binary contrasts: *2014–2018 normalcy* (0; reference category) versus *2010–2013 post-economic crisis recovery* (1), and *2014–2018 normalcy* (0) versus *2006–2009 pre-economic crisis* (1).

**VET Entry Before First Interview:** We included the binary variable VET entry before first interview in the analyses to compensate for potential causal effects because some respondents had already started a VET position before their first interview—that is, before all other independent variables had been collected. We coded the variable as 0 (*no*) versus 1 (*yes*).

#### 4.4.2.4 Time-Varying Control Variable Process Time

We included the process time in months between VET entry and  $t_0$ , between VET entry and  $t_1$ , and between VET entry and  $t_2$  in the analyses because the time that elapsed between the single observations differed among respondents.

### 4.4.3 Analyses

#### 4.4.3.1 Main Analyses

Using Mplus Version 8.4 (Muthén & Muthén, 1998–2017), we applied conditional latent growth curve (LGC) modeling to analyze the relationships between the AAG, the control variables, and both the initial level of SWB and changes in SWB during VET. LGC modeling allowed us to analyze the systematic intra-individual changes in repeated measures over time, on the one hand, and inter-individual differences in these changes, on the other. LGC models predict the random intercept (i.e., the initial level) and the random linear slope (i.e., mean growth rate of change) by means of other (time-invariant and/or time-varying) covariates (conditional LGCs). In this way, we can explain in more detail why some individuals experi-

ence a certain type of change in SWB and why others do not. We defined the initial observation time when starting VET ( $t_0$ ) as the intercept. This allowed us to predict the initial level of SWB (i.e., the intercept) after entry into VET as well as the change in (i.e., the slope of) SWB during the course of VET over a period of 2 years ( $t_0$ – $t_2$ ; i.e., when starting VET to 1–2 years in VET) over these initial levels.

For each dependent variable (i.e., general life satisfaction, job satisfaction, and income satisfaction), we ran the following analyses: In the first step, we modeled an unconditional LGC model without predictors (Model I) to test how well a LGC model fit the data. In the second step, we used the two AAG dummy variables as manifest time-invariant predictors of SWB (Model II) to examine whether there was an effect of AAG on SWB, thereby using the auxiliary option to identify the missing data correlates of aspirations and attainment in addition to the analysis variables (see Muthén & Muthén, 1998–2017). In the third step, we conducted further analyses that additionally included the control variables as manifest time-invariant predictors (Model III) to investigate whether these variables changed the effect of AAG on SWB.<sup>12</sup> A schematic depiction of the most complex model with predictor variables is displayed in Appendix E.

We computed Models II–IV twice: first, with the two dummy AAG variables with the threshold of zero with underachievement as  $AAG < 0$ , overachievement as  $AAG > 0$ , and perfect match as  $AAG = 0$ . Second, we used the two dummy AAG variables with the threshold of  $|5|$  with underachievement as  $AAG < -5$ , overachievement as  $AAG > 5$ , and perfect match as  $-5 \leq AAG \leq 5$ . We compared the effects of these two different AAG thresholds on SWB to find out whether a large AAG ( $\geq |5|$ ) affected SWB more than the more conservative computation of an AAG ( $< 0$ ).

We modeled the LGCs in a linear fashion with fixed time scores (i.e., loadings of the slopes) of 0 ( $t_0$ ), 1 ( $t_1$ ), and 2 ( $t_2$ ). The loadings of the intercepts of the three observation times of each SWB domain were 1. We used maximum likelihood estimation with robust standard errors (MLR) and restricted all latent variances (i.e., of the intercept and slope) to be positive defined. The variances of the independent variables were modeled as free parameters to be estimated using default starting values. Furthermore, we used full information maximum likelihood (FIML) estimation in our analyses to handle missing values on single items (unit non-

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<sup>12</sup> For the prediction of general life satisfaction only, in the fourth step, we included pre-VET general life satisfaction at  $t_{-1}$  as additional manifest predictor (Model IV) to control for unobserved heterogeneity. The model estimates are reported in Appendix D.

response and item nonresponse). Prior to the analyses, we recoded negatively keyed items, such as reversed Big Five items.<sup>13</sup>

#### 4.4.3.2 Sensitivity Analyses

Because the elapsed (i.e., process) time between the single observations differed among respondents, we computed all models (i.e., Models I–III and I–IV, respectively) a second time as robustness checks, while including the process time variables as manifest time-varying predictors of SWB, thereby assigning the elapsed time to each measurement occasion of SWB as depicted in Appendix E. The results of these sensitivity analyses fully confirmed those of the main analyses reported below and are available upon request.

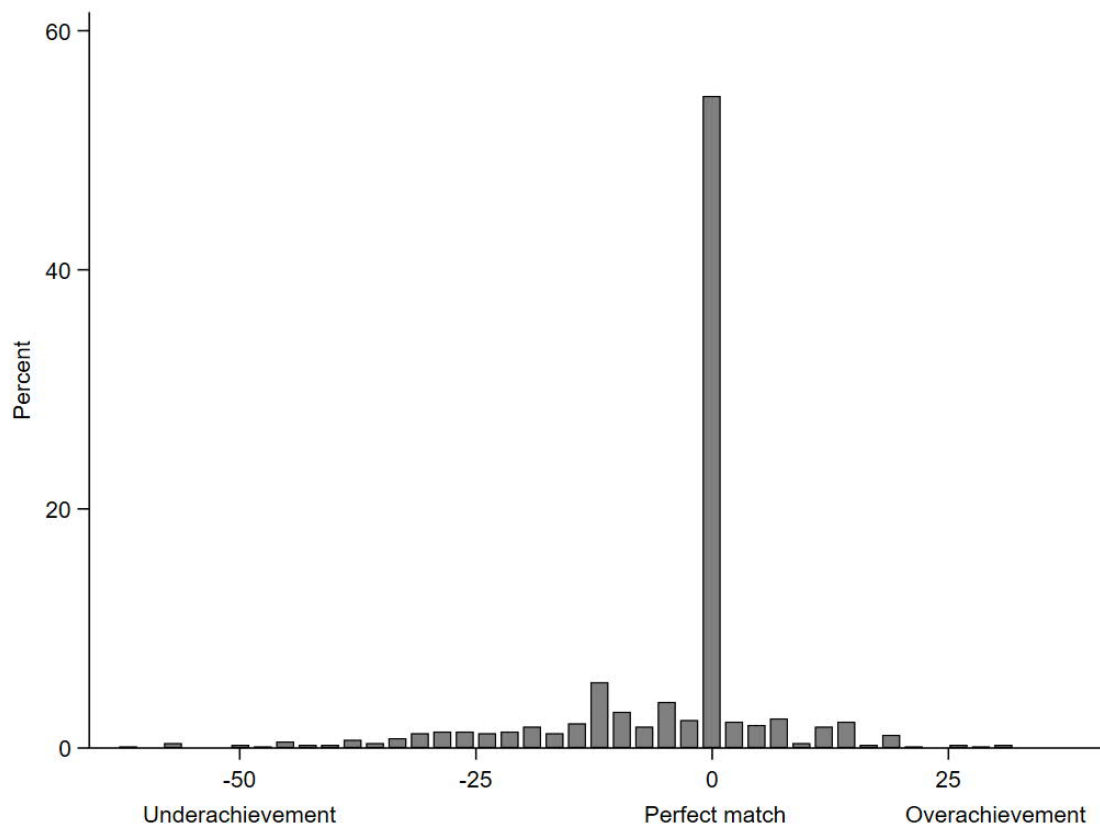
## 4.5 Results

### 4.5.1 Depiction of the AAG

As Figure 4.1 shows, for the proportion of the sample for which both an aspiration and an attainment value were available (about 50%), the ISEI score of the attained VET position perfectly matched the ISEI score of their aspired occupation in 52.3% cases—that is, these respondents fully realized their aspirations in terms of SES. In 14.6% of cases, respondents even surpassed their aspirations by attaining VET positions with ISEI scores that were up to 32 points higher than that of their aspired occupations (i.e., overachievement). By contrast, 33.1% of respondents fell short of their aspirations and attained VET positions with ISEI scores that were up to 63 points lower than that of their aspired occupations (i.e., underachievement). The percentages of the distribution of the components of the AAG (i.e., aspirations and attainment) can be found in Appendix F.

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<sup>13</sup> The following points differed from the preregistration: (a) Instead of focusing on the period between VET entry and a maximum of 3 years after VET entry, we focused on the period between VET entry and a maximum of 2 years after VET entry because valid cases for SWB values 3 years after VET entry were too small (about 50). (b) Instead of using the difference score on the metric AAG variable, we used two sets of dummy AAG variables with different AAG thresholds (0 and |5|) and compared the effects of these two thresholds on SWB because the sample sizes and variances within the group of  $AAG < 0$  and  $AAG > 0$  were too small. (c) We did not center the continuous independent variables. (d) We did not control for cognitive ability, because cognitive ability has not been shown to be a confounding variable of the AAG in previous research (e.g., Nießen et al., 2021).

**Figure 4.1:** *Percentages of the Distribution of the Aspiration–Attainment Gap*

*Note.*  $N = 726$ . As a metric variable, the peak in the middle includes both the zeros and a few additional observations with values close to zero.

## 4.5.2 Prediction of the Initial Level and Change in SWB

We started by regressing the initial level (i.e., intercept) and the mean growth rates of change (i.e., linear slope) of three domains of SWB (general life satisfaction, job satisfaction, and income satisfaction) on the predictor variables.

### 4.5.2.1 Unconditional Model (Model I)

The first model we analyzed was the unconditional LGC model without predictors (Model I). The model results are displayed in Table 4.2. According to the benchmarks proposed by Hu and Bentler (1999), this basis model showed a very good model fit for all dependent variables: general life satisfaction— $\chi^2(1) = 0.004$ ,  $p = .948$ , comparative fit index (CFI) = 1.000, root-mean-square error of approximation (RMSEA) = .000, standardized root-mean-square residual (SRMR) = .001, Bayesian information criterion (BIC) = 8,592.899; job satisfaction— $\chi^2(1) = 1.397$ ,  $p = .237$ , CFI = .997, RMSEA = .019, SRMR = .012, BIC = 7,864.152; income

satisfaction— $\chi^2(1) = 0.323$ ,  $p = .570$ , CFI = 1.000, RMSEA = .000, SRMR = .005, BIC = 9,208.292.

Although the intercept–slope covariance was significant only for income satisfaction, job satisfaction and general life satisfaction tended in the same—namely, negative—direction. This negative intercept–slope covariance in connection with a negative slope in all SWB domains showed that higher initial levels of SWB were related to up to 1.2 scale points steeper declines, or more decline over time, and lower initial levels of SWB were related to slower declines, or a less steep negative slope.

**Table 4.2:** *Unstandardized Coefficients of the Unconditional Latent Growth Curve Models (Model I)*

	General life satisfaction			Job satisfaction			Income satisfaction		
	Coef.	SE	<i>p</i>	Coef.	SE	<i>p</i>	Coef.	SE	<i>p</i>
Intercept–slope									
Covariance ( $t_0$ )	−0.254	0.147	.083	−0.496	0.289	.087	<b>−1.171</b>	0.360	.001
Covariance ( $t_2$ )	−0.334	0.181	.066	0.573	0.293	.051	−0.562	0.360	.119
Means									
Intercept ( $t_0$ )	7.724	0.047	<.001	7.916	0.066	<.001	6.108	0.088	<.001
Intercept ( $t_2$ )	7.377	0.066	<.001	7.198	0.088	<.001	5.661	0.100	<.001
Linear slope	−0.173	0.038	<.001	−0.359	0.053	<.001	−0.224	0.059	<.001
Variances									
Intercept ( $t_0$ )	1.376	0.230	<.001	2.455	0.469	<.001	5.594	0.569	<.001
Intercept ( $t_2$ )	1.535	0.321	<.001	2.609	0.470	<.001	4.376	0.575	<.001
Linear slope	0.294	0.135	.030	0.535	0.248	.031	0.867	0.303	.004
Residual variances									
Satisfaction $t_0$	1.178	0.233	<.001	1.081	0.453	.017	1.768	0.525	.001
Satisfaction $t_1$	1.277	0.142	<.001	2.244	0.250	<.001	2.663	0.241	<.001
Satisfaction $t_2$	1.088	0.269	<.001	1.660	0.453	<.001	1.703	0.532	.001

*Note.*  $N_{\text{life}} = 1,209$ ;  $N_{\text{job}} = 1,047$ ;  $N_{\text{income}} = 1,101$ . Intercept–slope covariances significant at the  $p < .05$  level are in bold type.

#### 4.5.2.2 The AAG Predicting SWB (Model II)

The second model we analyzed was the conditional LGC model with the two dummy AAGs as predictors (Model II). The model results are displayed in Table 4.G1 in Appendix G. As shown in that table, both underachievement and overachievement were statistically significant predictors of lower levels of general life satisfaction and job satisfaction after VET entry (i.e., the intercept) in the case of the AAG threshold of zero, thus confirming Hypothesis 1a, which states that underachievement compared to perfect match predicts lower initial levels of SWB. This finding means that a negative and a positive AAG (i.e., underachievement and overachievement of occupational aspirations in terms of SES) were associated with 0.3–0.5 lower

initial levels of general life satisfaction and 0.3–0.7 lower initial levels of job satisfaction. In the case of the AAG threshold of |5|, the effect of underachievement remained about the same, whereas the effect of overachievement decreased slightly and was no longer significant. However, overachievement still showed larger negative effects on the initial level of SWB than underachievement—namely,  $-0.4$  scale points for general life satisfaction and  $-0.6$  scale points for job satisfaction.

Income satisfaction showed a different picture: The negative significant effect of underachievement on the intercept in the case of the zero threshold even increased in the case of the |5|-threshold, thus confirming Hypothesis 1b and indicating that falling short of occupational aspirations by at least 5 ISEI score points (i.e., a large AAG) was associated with 0.9 lower scale points in income satisfaction. Furthermore, the non-significant tendency of overachievement on the intercept in the case of the zero threshold increased substantially in the case of the |5|-threshold, with 0.8 scale points lower income satisfaction for those who exceeded their aspirations by at least 5 ISEI score points. This indicates that the effect on income satisfaction became stronger when AAG values deviated more (by at least 5 ISEI score points) from zero (i.e., became larger). Overall, the influence of the AAG on SWB was strongest for income satisfaction, followed by job satisfaction, and was weakest for general life satisfaction.

Only job satisfaction showed, at threshold |5|, a marginally significant positive effect of overachievement on the linear slope (i.e., mean growth rate of change), indicating that surpassing occupational aspirations by at least 5 ISEI score points led to a 0.4 scale points higher increase in job satisfaction over time. Thus, Hypotheses 2a and 2b could not be confirmed, as the AAG did not predict the development of SWB over time.

The intercept–slope covariance again showed the strongest negative effect for income satisfaction, but this effect was slightly decreased compared to Model I. Higher initial levels of SWB were related to 1.1 scale points steeper declines in income satisfaction over time.

#### **4.5.2.3 The AAG and the Covariates Predicting SWB (Model III)**

The third model we analyzed was the conditional LGC model with the two dummy AAGs and all control variables as predictors (Model III). The model results are displayed in Appendix H. The regression coefficients of under- and overachievement on the intercept and the linear slope of SWB are additionally depicted in Figure 4.2. When additionally taking the covariates into account, the picture was similar to that in Model II in terms of the directions and strength of the effects, thus confirming Hypothesis 1a that underachievement (and also overachieve-



ment) predicts lower initial levels of SWB after VET entry. Again, the impact of the AAG on income satisfaction was strongest, followed by job satisfaction, and the impact of the AAG on general life satisfaction was weakest.

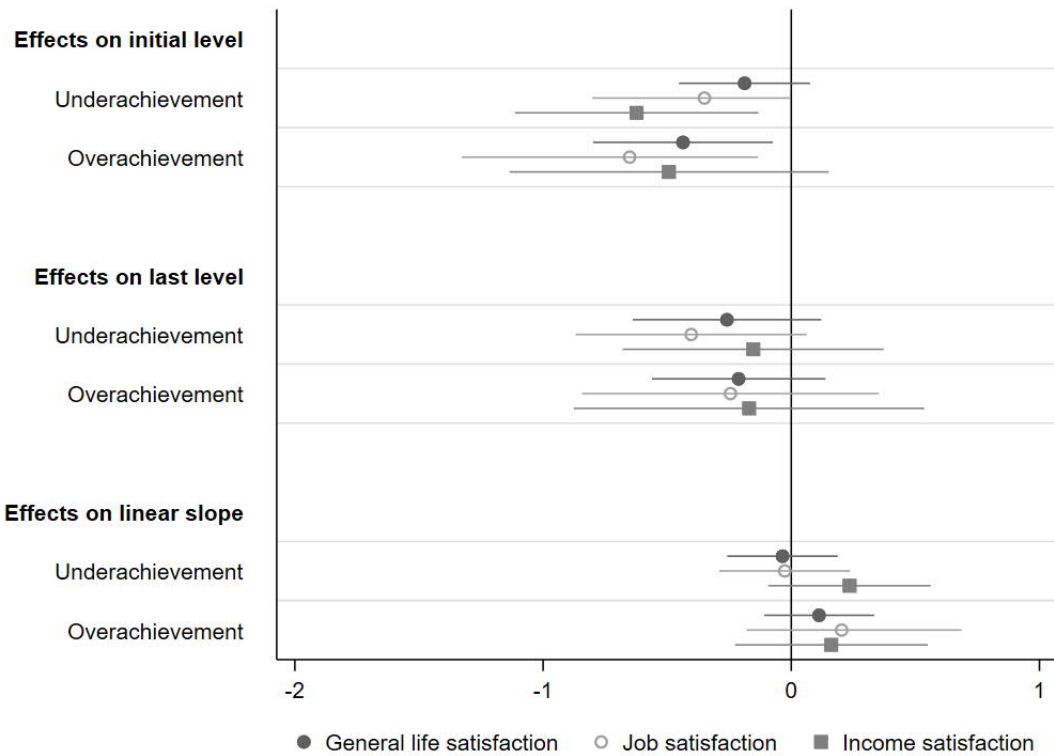
Taking a look at the three SWB domains separately revealed, first, that the negative effects of under- and overachievement on the initial level of general life satisfaction decreased slightly compared to Model II, and that there was a significant influence of overachievement only on the intercept at threshold 0. However, the effect at threshold |5| was still recognizable and was comparable to that in Model II. Surpassing occupational aspirations led to 0.4 scale points lower general life satisfaction. Second, the negative effects of under- and overachievement on the initial level of job satisfaction were very similar to those in Model II, and increased only very slightly compared to that model. Falling short of or surpassing occupational aspirations led to 0.4–0.7 scale points lower job satisfaction. Third, the negative effects of under- and overachievement on the initial level of income satisfaction even increased substantially—especially at threshold |5|—thereby revealing that falling short of or exceeding aspirations by at least 5 ISEI score points (i.e., a large AAG) was related to almost 1 scale point lower income satisfaction. Hypothesis 1b could be confirmed especially in the case of income satisfaction and job satisfaction, as large AAGs were associated with lower initial levels of SWB.

Similar to Model II, there was no significant impact of the AAG on the mean rate of change in SWB for any of the three SWB domains. However, there were nevertheless small positive tendencies that even increased at threshold |5|: Exceeding aspirations was related to 0.2–0.4 scale points higher increases in SWB over time, and falling short of aspirations was related to up to 0.3 scale points higher increases in SWB over time (lowest for general life satisfaction and highest for income satisfaction). Thus, Hypotheses 2a and 2b could not be confirmed, as SWB increased only slightly over the course of VET as a function of the AAG (and of large AAGs).

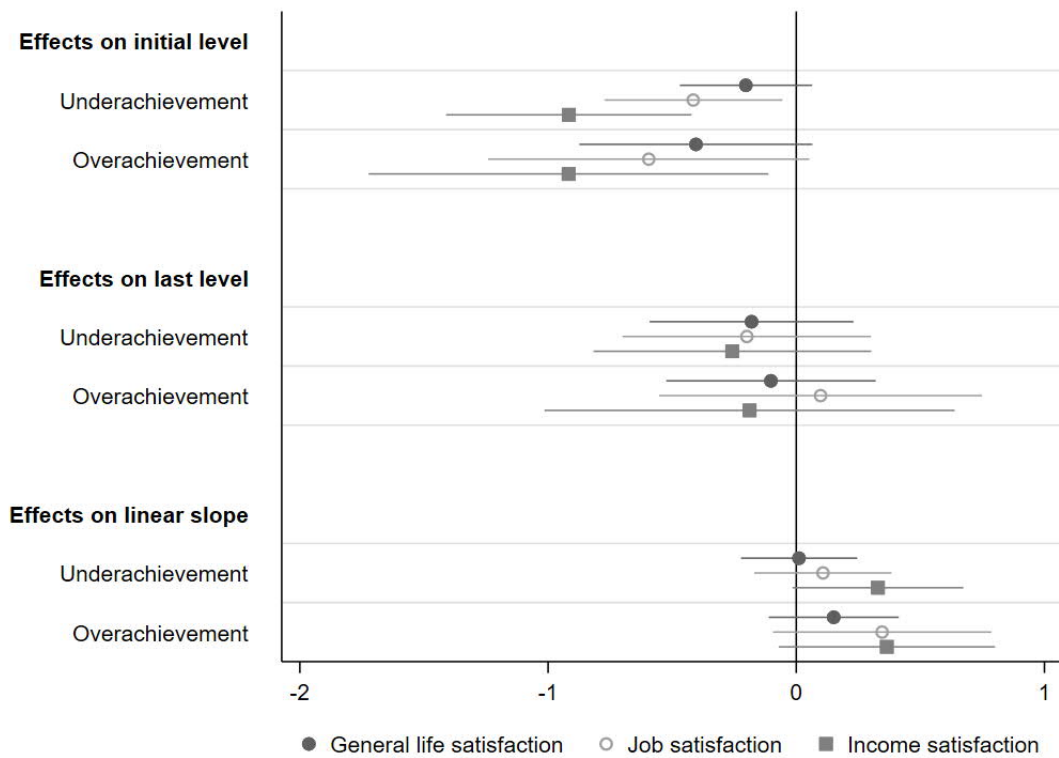
The intercept–slope covariance was significant for income satisfaction (threshold 0 and |5|) and for job satisfaction (threshold 0 only but there was also a tendency for threshold |5| in the same—namely negative—direction). In contrast to Models I and II, the linear slope was positive in both SWB domains (but for job satisfaction at threshold |5|), implying that higher initial levels of SWB were related to 0.6–1.1 scale points lower increase, or slower rates of positive change, in SWB over time, and lower initial levels of SWB were related to steeper increases or a steeper positive slope.

**Figure 4.2:** *Three Domains of SWB Regressed on the AAG (Model III) –  $t_0$  as Intercept and  $t_2$  as Intercept*

A



B



*Note.*  $N = 1,536$ . SWB = subjective well-being, AAG = aspiration–attainment gap. Unstandardized regression coefficients with 95% confidence interval. A: AAG-threshold 0. B: AAG-threshold [5].

### 4.5.3 Prediction of the Last Level of SWB

Second, we predicted the level of general life satisfaction, job satisfaction, and income satisfaction reached at the last observation at  $t_2$  to investigate whether experiencing an AAG predicted the level of SWB in the final phase of VET, and whether there were differences compared to the models where the initial level of SWB (i.e.,  $t_0$ ) was defined as the intercept. In the following, we describe only the most important results that differ compared to the models with the intercept defined as  $t_0$ , and only for Model III including the covariates. The model coefficients that differ compared to the model predicting the initial level of SWB are displayed in Table 4.2 (for Model I), in Appendix G (for Model II), and in Appendix H (for Model III). The regression coefficients of under- and overachievement on the intercept of SWB (Model III) are additionally depicted in Figure 4.2.

In almost all cases, the effects of under- and overachievement on SWB were discernibly lower than for the models where the initial level was the intercept. However, with one exception, the direction of the effects remained the same (0.1 to  $-0.4$  scale points vs.  $-0.2$  to  $-0.9$  scale points). Thus, apprentices who experienced an AAG were no longer less satisfied than their peers who had obtained the VET positions in the occupations to which they aspired, although a slight tendency toward lower SWB was still apparent.

## 4.6 Discussion

The present study examined the consequences of an occupational AAG (i.e., the discrepancy between the SES of the aspired and attained occupation) for three SWB domains (general life satisfaction, job satisfaction, and income satisfaction) among apprentices in Germany. We analyzed the relevance of underachievement and overachievement compared to no AAG on the initial and final level of SWB after VET entry as well as on the development of SWB over the course of VET for a period of up to 2 years.

### 4.6.1 Experiencing an AAG Decreases Apprentices' Initial and Final Levels of SWB

Our preregistered Hypotheses 1a and 1b relating to the initial levels of SWB, which were based on aspiration theory (Starbuck, 1963), multiple discrepancy theory (Michalos, 1985), and self-discrepancy theory (Higgins, 1987), could be fully confirmed. Consistent with evidence from the literature (e.g., Carr, 1997; Hardie, 2014), unmet expectations (underachieve-

ment and overachievement) were associated with lower initial levels of SWB during the first year of VET. The strongest negative effects of an AAG on SWB were found for income satisfaction, followed by job satisfaction—that is, work-related SWB—particularly for large negative AAGs. For general life satisfaction, we found only small effects.

It may be surprising at first glance that we also observed a clear negative impact of *overachievement* on all three SWB domains. This finding contradicts the level of aspiration theory (e.g., Starbuck, 1963), according to which realized or exceeded aspirations are perceived as success and therefore enhance SWB. A possible explanation for this is that the SES of the VET position attained is not decisive for apprentices' SWB; rather, the decisive factor is whether or not apprentices obtain the exact occupation (i.e., VET position) to which they aspired, regardless of whether the position they attained confers a higher (or lower) social status than the occupation to which they originally aspired. A study with an adult female sample reported similar results—namely, that both under- and overachievement were related to lower perceptions of being very successful in working life (Carr, 1997). This raises the question of what actually determines whether an AAG will negatively impact SWB. Speculatively, the decisive factors could be the occupational fields in question (see also Wicht et al., 2021) and the skills and characteristics required for the occupations aspired to and attained. This assumption is in line with previous findings showing that AAGs with respect to the occupational field are most relevant for both enjoyment of and dropout from VET (Ahrens et al., 2021a; Beckmann et al., 2021).

Moreover, the results indicate that overachievement has an even stronger negative effect on job satisfaction and general life satisfaction than underachievement does, and that at threshold |5| overachievement and underachievement have an equally strong and more pronounced effect on income satisfaction. Thus, our results do not support the assumption that underachievement is more relevant for SWB than overachievement. One possible reason for this finding is that overachievers might perceive the tasks associated with their VET positions to be too challenging and demanding, which is reflected in their job satisfaction and general life satisfaction. The same applies to income satisfaction. Income may not be evaluated in absolute terms but rather against the background of the individual's own effort.

Because both under- and overachievement showed similar patterns, and because not achieving the desired VET position—rather than the status difference between the occupation aspired to and the occupation in which a VET position was attained—appeared to be crucial, we ran Model III including the confounding variables again (intercept defined as initial level of SWB only), combining the groups of under- and overachievers and testing them against

those with a perfect match. As expected, the effect sizes lay roughly in the middle between the effects of under- and overachievement, and were all negative (general life satisfaction:  $-0.3$ , job satisfaction:  $-0.5$ , income satisfaction:  $-0.6$  to  $-0.9$  scale points; see Appendix H). However, the effects of the combined group were more often statistically significant—*inter alia*, the impact of the AAG on the change in income satisfaction was also significant ( $-0.3$  scale points)—presumably because the sample sizes were larger. These results reinforce the interpretation that neither the direction of the AAG nor the extent of the AAG in terms of SES is the key determinant of whether it will negatively impact SWB, but rather the mere fact of whether or not apprentices are able to obtain the exact type of position to which they aspired.

#### **4.6.2 Experiencing an AAG Is Largely Unrelated to the Development of SWB Over the Course of VET**

Our results did not confirm our preregistered Hypotheses 2a and 2b relating to changes in SWB over time, which were based on the concept of the hedonic treadmill (Brickman & Campbell, 1971). Although there was a consistent tendency across outcomes for the initially lower SWB levels of individuals who experienced an AAG to gradually return to the levels of their peers who did not experience an AAG, few of the associations between the AAG and the slope of SWB were statistically significant. This is in line with the observation that SWB often returns to a stable baseline level after positive or negative life experiences such as filial bereavement or unemployment (e.g., Leopold & Lechner, 2015; Luhmann et al., 2012), a phenomenon also known as a process of hedonic adaptation.

Although the effect sizes were rather small for the association between AAG and SWB development, in most cases there were somewhat higher tendencies toward dissatisfaction in the case of large AAGs and of overachievement. In all, however, both overachievers and underachievers were more dissatisfied at the beginning of VET, as reflected in the clear and significant differences (compared with those who experienced a perfect match between aspirations and attainment). At the end of VET, those with an AAG remained slightly more dissatisfied, but these differences were no longer significant and decreased substantially, as indicated by the smaller effect sizes of the AAG at the last SWB level compared with the initial level. In this context, it should however be noted that the remaining sample size for the last observation had decreased considerably. This finding also corresponds to our above interpretation that not realizing occupational aspirations has negative consequences on SWB, regardless of

the SES of the occupations in question, and that this is related to occupational field, interests, and skills.

### 4.6.3 Implications

To sum up, the present investigation reveals that both negative and positive occupational AAGs (i.e., under- and overachievement) impair the level of SWB after entry into VET and—to a lesser degree—in the final phase of VET, and predict a tendency toward a larger positive change in SWB over the course of VET. By looking at three different domains of SWB, we were able to provide a nuanced picture of the consequences for SWB of an occupational AAG among adolescents in an early-career stage over a period of 2 years in Germany. This constitutes a substantial contribution to the literature on school-to-work transitions. Because the AAG is a highly prevalent phenomenon (e.g., Nießen et al., 2021) that affects SWB, which in turn is a predictor of various work-related outcomes such as work motivation (e.g., Ton & Hansen, 2001) and later undesired job turnover (e.g., Medici et al., 2020), and because VET determines career options within a specific occupational field, it is likely that SWB serves as a mediator between the AAG and long-term consequences for career progression. Hence, to better understand this phenomenon, it is a task of future research to scrutinize this mediating role of the AAG, for example, in dropout from VET (see, e.g., Beckmann et al., 2021), completion of VET, and other “harder” career outcomes. The findings of this research will be relevant for policymakers and employers who wish to initiate interventions to improve SWB during VET to support further career development—especially because the wishes and expectations of school leavers do not necessarily coincide with the VET positions available on the labor market (i.e., employment realities; Hoff et al., 2021).

### 4.6.4 Limitations of the Present Study and Directions for Future Research

The present study has some limitations. First, the focus was on the level and development of SWB after the transition from school to VET and during VET, and for this purpose we used data from school leavers whose school-leaving qualifications ranged from the basic school-leaving qualification (*Hauptschulabschluss*) to the general higher education entrance qualification (*Abitur*). As the latter qualification entitles school leavers to attend university, future research is needed to ascertain whether our findings can be generalized to other educational transitions and replicated in other national contexts.

Furthermore, our results suggest that the AAG no longer has a (large) impact on the level of SWB at the end of VET or on the development of SWB during VET. However, the

statistical power of our analyses was somewhat limited by missing data arising inter alia from panel attrition. These missing data also meant that we were unable to observe the development of SWB during VET over a longer (ideally 3-year) period as originally intended. Thus, future research should explore this tendency further over a longer period. Indeed, the literature emphasizes that underachievers often downgrade their aspirations over time to better cope with the disappointments they experience (e.g., Tomasik et al., 2009). Whether this is also the case for overachievers in the opposite way remains to be clarified.

## 4.7 Conclusion

The results of the present study reveal differences in apprentices' level of SWB (most notably for work-related satisfaction) as a function of an occupational AAG at the beginning of VET: Those who did not obtain a VET position in their aspired occupation were more dissatisfied at the beginning of VET than those who did. At the end of VET, there were no longer any significant differences between the two groups, but a slight tendency in the same direction was observable. Particularly strong discrepancies between aspirations and attainment led to higher dissatisfaction. However, it was not a particular type of AAG (overachievement vs. underachievement) that appeared to impair SWB, but rather the fact that a VET position in the aspired occupation was not obtained, regardless of the SES that that position conferred. Related to this finding, we found no clear evidence of different changes in SWB between individuals with and without an AAG, but again there was a slight tendency for an increase in SWB over the course of VET for those with an AAG. Thus, our results show that experiencing an AAG—whether overachievement or underachievement—is detrimental to SWB, and tends to remain so (although with waning effect sizes) over a period of 2 years. Further research should extend these findings by examining both the impact of an occupational AAG and the mediating role of SWB on subsequent career development.

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## 4.9 Appendices

### 4.9.1 Appendix A

#### **The Consequences of Aspiration–Attainment Gaps for Subjective Well-Being: Previous Evidence on Possible Confounding Variables**

A recent study of adolescents beginning vocational education and training (VET) in Germany reported that lower levels of Big Five Emotional Stability, Agreeableness, and Conscientiousness, and higher levels of Big Five Openness were associated with a higher likelihood of experiencing an occupational aspiration–attainment gap (AAG)/a higher risk of a larger AAG (Nießen et al., 2021). Moreover, across different studies, the Big Five dimensions have consistently been found to be positively related to domains of subjective well-being (SWB)—for example, satisfaction with VET (e.g., Nießen et al., 2020), job satisfaction (for a review, see Therasa & Vijayabanu, 2015), and life satisfaction (e.g., Bond et al., 2020)—although not all dimensions were always equally relevant. Individuals with lower parental SES have been found to be more likely to experience an educational (e.g., Hanson, 1994) or occupational (e.g., Nießen et al., 2021) AAG, whereas higher parental SES has been found to be associated with a larger AAG (e.g., Nießen et al., 2021) and higher life satisfaction (e.g., Chen et al., 2016). Having a migration background has been shown to be related to a higher likelihood of experiencing an occupational AAG and a larger occupational AAG (e.g., Nießen et al., 2021). Furthermore, studies from the USA have reported that, compared to Whites, Blacks (and Hispanics) tend to report lower job satisfaction (e.g., Ganzach, 1998) and life satisfaction (e.g., Barger et al., 2009).

Previous findings regarding the relationship between sex, the AAG, and SWB have been inconsistent. Most studies have shown that males have a higher likelihood of experiencing an educational (e.g., Hanson, 1994) or occupational (e.g., Nießen et al., 2021) AAG, and that females are more likely to experience larger educational (e.g., Paat, 2015) or occupational (e.g., Nießen et al., 2021) AAGs. With respect to SWB, a recent cross-nationally comparative study found higher life satisfaction in females in 18 nations (Bond et al., 2020). Other studies have reported, for example, higher VET satisfaction in males (e.g., Nießen et al., 2020) or higher job satisfaction in females (e.g., Bui, 2017).

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## 4.9.2 Appendix B

**Table 4.B1:** Correlations Between Three Domains of Subjective Well-Being and all Other Variables Included in the Study

	<i>r</i> [95% CI] (pairwise <i>N</i> )									
	General life satisfaction			Job satisfaction			Income satisfaction			
	<i>t</i> <sub>1</sub>	<i>t</i> <sub>0</sub>	<i>t</i> <sub>1</sub>	<i>t</i> <sub>2</sub>	<i>t</i> <sub>0</sub>	<i>t</i> <sub>1</sub>	<i>t</i> <sub>0</sub>	<i>t</i> <sub>1</sub>	<i>t</i> <sub>0</sub>	<i>t</i> <sub>2</sub>
General life satisfaction <i>t</i> <sub>0</sub>	.35 [.29, .41] (773)									
General life satisfaction <i>t</i> <sub>1</sub>	.28 [.21, .36] (575)	.42 [.36, .48] (699)								
General life satisfaction <i>t</i> <sub>2</sub>	.29 [.18, .39] (307)	.34 [.24, .42] (364)	.49 [.41, .55] (429)							
Job satisfaction <i>t</i> <sub>0</sub>	.16 [.09, .23] (689)	.30 [.23, .37] (696)	.24 [.15, .33] (458)	.17 [.05, .30] (237)						
Job satisfaction <i>t</i> <sub>1</sub>	.12 [.04, .20] (556)	.25 [.18, .32] (669)	.33 [.26, .39] (780)	.27 [.18, .36] (418)	.46 [.39, .53] (449)					
Job satisfaction <i>t</i> <sub>2</sub>	.11 [−.01, .22] (296)	.31 [.21, .40] (350)	.21 [.11, .30] (415)	.39 [.30, .47] (420)	.37 [.26, .48] (228)	.49 [.41, .56] (407)				
Income satisfaction <i>t</i> <sub>0</sub>	.23 [.16, .30] (756)	.30 [.24, .36] (764)	.24 [.15, .32] (488)	.06 [−.06, .18] (255)	.36 [.29, .42] (697)	.14 [.06, .23] (470)	.07 [−.05, .20] (245)			
Income satisfaction <i>t</i> <sub>1</sub>	.17 [.09, .24] (570)	.18 [.10, .25] (688)	.33 [.27, .39] (803)	.18 [.09, .27] (425)	.22 [.13, .30] (453)	.33 [.27, .39] (781)	.12 [.02, .21] (411)	.57 [.51, .63] (483)		
Income satisfaction <i>t</i> <sub>2</sub>	.17 [.06, .28] (306)	.23 [.13, .32] (361)	.25 [.16, .34] (427)	.28 [.18, .36] (432)	.17 [.04, .29] (235)	.30 [.22, .39] (416)	.28 [.19, .37] (422)	.45 [.35, .55] (253)	.59 [.52, .65] (422)	

(continued)

Table 4.B1 (continued)

$r$ [95% CI] (pairwise $N$ )												
General life satisfaction				Job satisfaction				Income satisfaction				
$t_1$	$t_0$	$t_1$	$t_2$	$t_0$	$t_1$	$t_2$	$t_0$	$t_0$	$t_1$	$t_2$		
Aspirations	.00	-.01	-.01	.01	-.01	-.04	.02	.04	.06	.01		
	[-.06, .07]	[-.08, .06]	[-.09, .07]	[-.10, .12]	[-.10, .08]	[-.13, .04]	[-.09, .14]	[-.04, .13]	[-.02, .14]	[-.09, .12]		
	(895)	(858)	(615)	(328)	(502)	(586)	(315)	(558)	(606)	(325)		
Attainment	-.00	-.02	.06	.08	-.02	-.01	.04	.09	.09	.09		
	[-.07, .07]	[-.09, .05]	[-.01, .13]	[-.02, .17]	[-.09, .06]	[-.08, .06]	[-.06, .14]	[.02, .16]	[.02, .16]	[-.01, .18]		
	(783)	(880)	(759)	(425)	(659)	(741)	(416)	(699)	(753)	(425)		
Aspiration–attainment gap	.02	.01	.02	.01	.02	.04	.02	.09	.04	.07		
	[-.07, .10]	[-.07, .08]	[-.06, .10]	[-.10, .12]	[-.08, .11]	[-.05, .12]	[-.09, .13]	[.00, .18]	[-.05, .12]	[-.05, .17]		
	(537)	(649)	(559)	(316)	(458)	(543)	(308)	(485)	(552)	(315)		
Underachievement (threshold 0)	-.06	-.04	-.07	-.05	-.05	-.12	-.06	-.11	-.10	-.09		
	[-.14, .03]	[-.11, .04]	[-.15, .02]	[-.16, .06]	[-.14, .05]	[-.20, -.03]	[-.17, .06]	[-.20, -.02]	[-.18, -.02]	[-.20, .02]		
	(537)	(649)	(559)	(316)	(458)	(543)	(308)	(485)	(552)	(315)		
Overachievement (threshold 0)	-.10	-.07	-.06	.04	-.12	-.01	-.02	.01	-.02	-.01		
	[-.18, -.02]	[-.15, .00]	[-.14, .03]	[-.07, .15]	[.21, -.03]	[-.09, .08]	[-.13, .10]	[-.08, .10]	[-.10, .07]	[-.12, .10]		
	(537)	(649)	(559)	(316)	(458)	(543)	(308)	(485)	(552)	(315)		
Underachievement (threshold .5)	-.08	-.05	-.05	-.04	-.07	-.12	-.03	-.14	-.12	-.11		
	[-.16, .00]	[-.13, .02]	[-.13, .03]	[-.15, .07]	[-.16, .03]	[-.20, -.03]	[-.14, .08]	[-.23, -.05]	[-.20, -.03]	[-.22, .00]		
	(537)	(649)	(559)	(316)	(458)	(543)	(308)	(485)	(552)	(315)		
Overachievement (threshold .5)	-.06	-.05	-.05	.07	-.09	.02	.05	-.03	-.03	.04		
	[-.15, .02]	[-.13, .03]	[-.13, .04]	[-.05, .18]	[-.18, .00]	[-.07, .10]	[-.06, .16]	[-.12, .06]	[-.11, .06]	[-.08, .15]		
	(537)	(649)	(559)	(316)	(458)	(543)	(308)	(485)	(552)	(315)		
Extraversion	.09	.09	.09	.10	.10	.02	.05	-.01	-.03	-.05		
	[.03, .15]	[.03, .15]	[.02, .15]	[.00, .19]	[.03, .18]	[-.05, .09]	[-.05, .15]	[-.08, .06]	[-.10, .04]	[-.14, .05]		
	(1,132)	(1,078)	(804)	(429)	(695)	(772)	(415)	(763)	(795)	(427)		
Agreeableness	.13	.16	.12	.08	.08	.09	.14	.13	.11	.10		
	[.07, .19]	[.10, .22]	[.05, .18]	[-.02, .17]	[.00, .15]	[.02, .16]	[.04, .23]	[.06, .20]	[.04, .18]	[.01, .19]		
	(1,133)	(1,080)	(805)	(429)	(696)	(774)	(415)	(764)	(797)	(427)		
Conscientiousness	.16	.13	.09	.05	.08	.09	.12	.05	.08	.07		
	[.10, .21]	[.07, .19]	[.02, .16]	[-.05, .14]	[.01, .15]	[.02, .16]	[.02, .21]	[-.02, .12]	[.01, .15]	[-.02, .17]		
	(1,135)	(1,082)	(807)	(430)	(697)	(775)	(416)	(765)	(798)	(428)		

(continued)



**Table 4.B1** (continued)

	<i>r</i> [95% CI] (pairwise <i>N</i> )											
	General life satisfaction				Job satisfaction				Income satisfaction			
	<i>t</i> <sub>1</sub>	<i>t</i> <sub>0</sub>	<i>t</i> <sub>1</sub>	<i>t</i> <sub>2</sub>	<i>t</i> <sub>0</sub>	<i>t</i> <sub>1</sub>	<i>t</i> <sub>2</sub>	<i>t</i> <sub>0</sub>	<i>t</i> <sub>1</sub>	<i>t</i> <sub>2</sub>	<i>t</i> <sub>0</sub>	<i>t</i> <sub>2</sub>
Emotional Stability	.14 [.09, .20] (1,136)	.14 [.08, .19] (1,084)	.16 [.09, .22] (808)	.20 [.11, .29] (431)	.11 [.04, .19] (698)	.07 [.00, .14] (776)	.13 [.03, .22] (417)	.04 [.03, .12] (766)	.04 [.04, .10] (799)	.07 [.02, .17] (429)		
Openness	.08 [.02, .14] (1,121)	.08 [.02, .14] (1,076)	.02 [.05, .09] (801)	.02 [.08, .11] (429)	.07 [.01, .14] (692)	.02 [.05, .09] (769)	-.03 [.13, .07] (415)	.06 [.02, .13] (760)	.03 [.04, .10] (792)	.01 [.09, .10] (427)		
Parental SES	.03 [.06, .12] (464)	.02 [.07, .11] (443)	.01 [.10, .12] (304)	-.03 [.20, .13] (140)	-.04 [.17, .08] (246)	-.14 [.25, .03] (291)	-.23 [.38, .06] (136)	.15 [.03, .27] (269)	.17 [.06, .28] (297)	.23 [.06, .38] (140)		
Migration background	.10 [.04, .16] (1,141)	.05 [.01, .11] (1,089)	.07 [.00, .14] (815)	.01 [.09, .10] (437)	.06 [.02, .13] (703)	-.05 [.12, .02] (784)	.04 [.05, .14] (423)	.01 [.07, .08] (772)	.01 [.06, .08] (807)	-.00 [.09, .09] (435)		
Female	-.08 [.13, .02] (1,141)	-.05 [.11, .01] (1,089)	-.03 [.10, .04] (815)	-.08 [.17, .01] (437)	-.05 [.13, .02] (703)	-.08 [.15, .01] (784)	-.04 [.14, .06] (423)	-.02 [.09, .05] (772)	-.02 [.09, .05] (807)	-.06 [.15, .04] (435)		
VET entry 2006–2009 (Pre-economic crisis)	-.07 [.13, .01] (1,141)	-.06 [.12, .00] (1,089)	-.09 [.16, .02] (815)	-.06 [.15, .03] (437)	-.05 [.12, .03] (703)	-.03 [.10, .04] (784)	-.07 [.16, .03] (423)	-.09 [.16, .02] (772)	-.09 [.15, .02] (807)	-.12 [.21, .03] (435)		
VET entry 2010–2013 (Post-economic crisis recovery)	.05 [.01, .11] (1,141)	.00 [.06, .06] (1,089)	.03 [.04, .10] (815)	-.00 [.10, .09] (437)	.00 [.07, .08] (703)	.02 [.05, .09] (784)	.02 [.08, .11] (423)	.04 [.03, .11] (772)	.01 [.06, .08] (807)	.04 [.06, .13] (435)		
VET entry before first interview	-.04 [.10, .01] (1,141)	.13 [.07, .18] (1,089)	.06 [.01, .13] (815)	.00 [.09, .10] (437)	-.01 [.08, .07] (703)	-.03 [.10, .04] (784)	-.02 [.11, .08] (423)	-.01 [.08, .06] (772)	.07 [.00, .14] (807)	.06 [.03, .16] (435)		

*Note.* *N* = 1,536. CI = confidence interval, SES = socioeconomic status, VET = vocational education and training.

### 4.9.3 Appendix C

#### Defining the Three Domains of Subjective Well-Being Examined in the Study

General life satisfaction refers to the global assessment of the overall quality (i.e., all aspects) of a person's life (e.g., Diener, 1984; Veenhoven, 1996). It can be regarded as the cognitive-evaluative component of subjective well-being (e.g., Diener, 1984).

Spector (1997) defined job satisfaction as “the extent to which people like [...] or dislike [...] their jobs” (p. 2), and the way they feel about different aspects of their jobs, for example, their treatment at work or the demands and challenges of the job. Job satisfaction and income are the two main outcome measures of career success (for a meta-analysis, see Ng et al., 2005), and experiencing high job satisfaction is crucial for further career progression (e.g., Medici et al., 2020).

Finally, income satisfaction can be understood simply as the degree to which people are satisfied with their personal income. According to the *effort–reward imbalance* (ERI) model (Siegrist, 1996), an imbalance between high work effort and low rewards (e.g., through income or recognition) is perceived as unfair, and results in negative feelings (e.g., disappointment, dissatisfaction) and poor health in the long term because of continuous strain reactions in the autonomic nervous system (Siegrist et al., 2004). Thus, low income satisfaction can prove problematic for the further life course and for career progression.

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#### 4.9.4 Appendix D

**Table 4.D1:** *Unstandardized Coefficients of the Latent Growth Curve Models for General Life Satisfaction Regressed on the Aspiration–Attainment Gap, the Covariates, and Pre-VET General Life Satisfaction (Model IV)*

	General life satisfaction					
	Threshold 0			Threshold +/-5		
	Coef.	SE	p	Coef.	SE	p
Intercept (t <sub>0</sub> ) on						
Underachievement	−0.105	0.128	.414	−0.112	0.129	.386
Overachievement	−0.253	0.188	.178	−0.248	0.243	.309
Intercept (t <sub>2</sub> ) on						
Underachievement	−0.165	0.183	.369	−0.084	0.198	.672
Overachievement	−0.096	0.182	.600	−0.013	0.216	.953
Intercept (t <sub>0</sub> ) on						
Conscientiousness	0.052	0.040	.196	0.054	0.040	.171
Extraversion	0.059	0.041	.147	0.060	0.041	.141
Agreeableness	<b>0.168</b>	0.052	.001	<b>0.166</b>	0.052	.001
Openness	0.053	0.047	.265	0.050	0.047	.286
Emotional Stability	<b>0.114</b>	0.045	.012	<b>0.118</b>	0.046	.010
Parental SES	0.002	0.004	.627	0.002	0.004	.620
Migration background	0.158	0.123	.198	0.152	0.122	.212
Female	0.006	0.095	.952	0.015	0.095	.872
Post-economic crisis recovery	−0.147	0.108	.173	−0.148	0.108	.170
Pre-economic crisis	<b>−0.258</b>	0.115	.025	<b>−0.255</b>	0.114	.025
VET entry before 1st interview	<b>0.531</b>	0.175	.002	<b>0.540</b>	0.171	.002
General life satisfaction t <sub>−1</sub>	<b>0.299</b>	0.040	<.001	<b>0.301</b>	0.040	<.001
Intercept (t <sub>2</sub> ) on						
Conscientiousness	−0.040	0.055	.462	−0.038	0.055	.482
Extraversion	0.056	0.058	.328	0.055	0.058	.339
Agreeableness	0.058	0.074	.431	0.057	0.074	.441
Openness	−0.033	0.067	.621	−0.040	0.067	.557
Emotional Stability	<b>0.263</b>	0.066	<.001	<b>0.262</b>	0.067	<.001
Parental SES	−0.006	0.006	.337	−0.005	0.006	.406
Migration background	0.069	0.170	.686	0.081	0.172	.636
Female	0.029	0.135	.828	0.033	0.136	.807
Post-economic crisis recovery	<b>−0.378</b>	0.167	.024	<b>−0.363</b>	0.166	.029
Pre-economic crisis	<b>−0.476</b>	0.164	.004	<b>−0.469</b>	0.163	.004
VET entry before 1st interview	0.020	0.182	.915	0.051	0.184	.784
General life satisfaction t <sub>−1</sub>	<b>0.233</b>	0.057	<.001	<b>0.239</b>	0.056	<.001
Linear slope on						
Underachievement	−0.030	0.111	.788	0.014	0.116	.905
Overachievement	0.079	0.115	.494	0.118	0.135	.383

(continued)

**Table 4.D1** (continued)

	General life satisfaction					
	Threshold 0			Threshold +/-5		
	Coef.	SE	<i>p</i>	Coef.	SE	<i>p</i>
Linear slope on						
Conscientiousness	−0.046	0.032	.155	−0.046	0.032	.149
Extraversion	−0.001	0.033	.964	−0.002	0.033	.943
Agreeableness	−0.055	0.043	.202	−0.055	0.043	.202
Openness	−0.043	0.040	.284	−0.045	0.039	.255
Emotional Stability	0.075	0.039	.058	0.072	0.040	.067
Parental SES	−0.004	0.003	.281	−0.003	0.003	.326
Migration background	−0.045	0.105	.670	−0.035	0.105	.736
Female	0.012	0.080	.882	0.009	0.080	.911
Post-economic crisis recovery	−0.115	0.097	.235	−0.108	0.097	.266
Pre-economic crisis	−0.109	0.099	.271	−0.107	0.098	.276
VET entry before 1st interview	<b>−0.256</b>	0.100	.010	<b>−0.245</b>	0.100	.015
General life satisfaction $t_{-1}$	−0.033	0.035	.342	−0.031	0.034	.368
Intercept–slope						
Covariance ( $t_0$ )	−0.178	0.125	.154	<b>−0.175</b>	0.068	.010
Covariance ( $t_2$ )	0.306	0.158	.053	0.303	0.157	.054
Means						
Underachievement	0.347	0.016	<.001	0.289	0.015	<.001
Overachievement	0.152	0.013	<.001	0.096	0.011	<.001
Conscientiousness	4.950	0.028	<.001	4.950	0.028	<.001
Extraversion	4.899	0.032	<.001	4.900	0.032	<.001
Agreeableness	5.351	0.024	<.001	5.351	0.024	<.001
Openness	4.638	0.026	<.001	4.638	0.026	<.001
Emotional Stability	4.047	0.029	<.001	4.047	0.029	<.001
Parental SES	43.160	1.105	<.001	42.953	1.120	<.001
Migration background	0.189	0.010	<.001	0.189	0.010	<.001
Female	0.452	0.013	<.001	0.452	0.013	<.001
Post-economic crisis recovery	0.339	0.012	<.001	0.339	0.012	<.001
Pre-economic crisis	0.213	0.010	<.001	0.213	0.010	<.001
VET entry before 1st interview	0.233	0.011	<.001	0.233	0.011	<.001
General life satisfaction $t_{-1}$	7.507	0.116	<.001	7.503	0.114	<.001
Intercepts						
Intercept ( $t_0$ )	3.267	0.483	<.001	3.218	0.475	<.001
Intercept ( $t_2$ )	4.876	0.687	<.001	4.779	0.676	<.001
Linear slope	0.805	0.416	.053	0.780	0.409	.056
Variances						
Underachievement	0.224	0.006	<.001	0.201	0.007	<.001
Overachievement	0.125	0.009	<.001	0.083	0.009	<.001
Conscientiousness	1.215	0.042	<.001	1.215	0.042	<.001
Extraversion	1.552	0.052	<.001	1.552	0.052	<.001
Agreeableness	0.856	0.032	<.001	0.856	0.032	<.001
Openness	0.993	0.033	<.001	0.993	0.033	<.001

(continued)

**Table 4.D1** (continued)

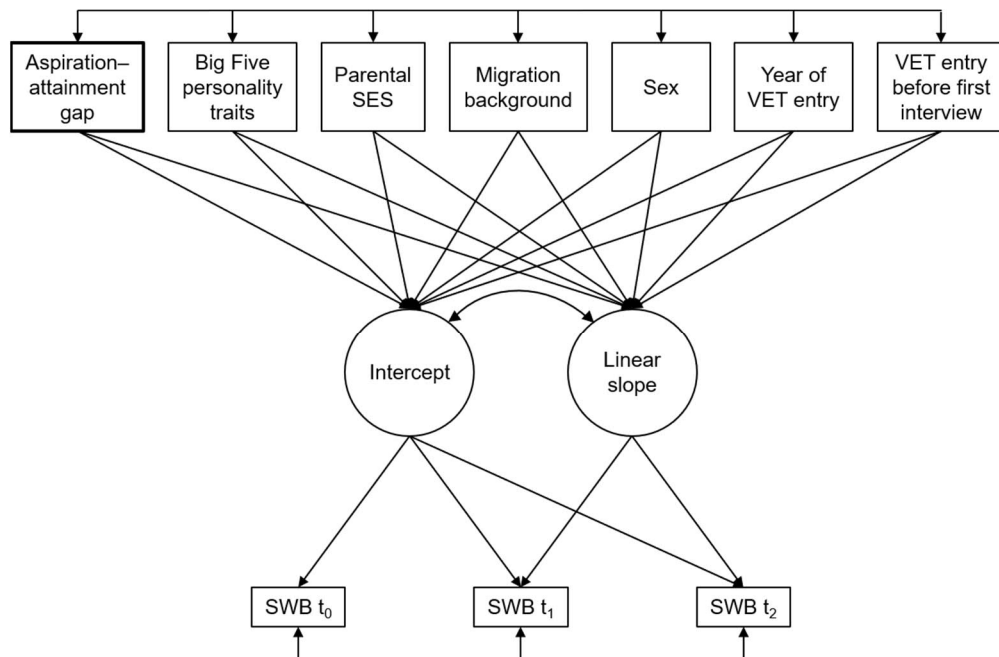
	General life satisfaction					
	Threshold 0			Threshold +/-5		
	Coef.	SE	<i>p</i>	Coef.	SE	<i>p</i>
Emotional Stability	1.309	0.044	<.001	1.309	0.044	<.001
Parental SES	347.554	14.902	<.001	347.111	14.519	<.001
Migration background	0.154	0.006	<.001	0.154	0.006	<.001
Female	0.248	0.001	<.001	0.248	0.001	<.001
Post-economic crisis recovery	0.224	0.004	<.001	0.224	0.004	<.001
Pre-economic crisis	0.168	0.006	<.001	0.168	0.006	<.001
VET entry before 1st interview	0.179	0.006	<.001	0.179	0.006	<.001
General life satisfaction $t_{-1}$	2.546	0.160	<.001	2.549	0.160	<.001
Residual variances						
General life satisfaction $t_0$	1.165	0.213	<.001	1.169	0.163	<.001
General life satisfaction $t_1$	1.270	0.135	<.001	1.275	0.137	<.001
General life satisfaction $t_2$	1.112	0.258	<.001	1.113	0.223	<.001
Intercept ( $t_0$ )	0.968	0.211	<.001	0.964	0.134	<.001
Intercept ( $t_2$ )	1.224	0.277	<.001	1.220	0.276	<.001
Linear slope	0.242	0.116	.038	0.239	0.053	<.001

*Note.*  $N = 1,536$ . VET = vocational education and training. Regression coefficients and intercept–slope covariances significant at the  $p < .05$  level are in bold type. Fit indices of the model with aspiration–attainment gap (AAG) threshold of 0:  $\chi^2(15) = 4.617$ ,  $p = .995$ , CFI = 1.000, RMSEA = .000, SRMR = .005, BIC = 68,819.882. Fit indices of the model with AAG threshold of |5|:  $\chi^2(15) = 5.227$ ,  $p = .990$ , CFI = 1.000, RMSEA = .000, SRMR = .005, BIC = 68,270.625.

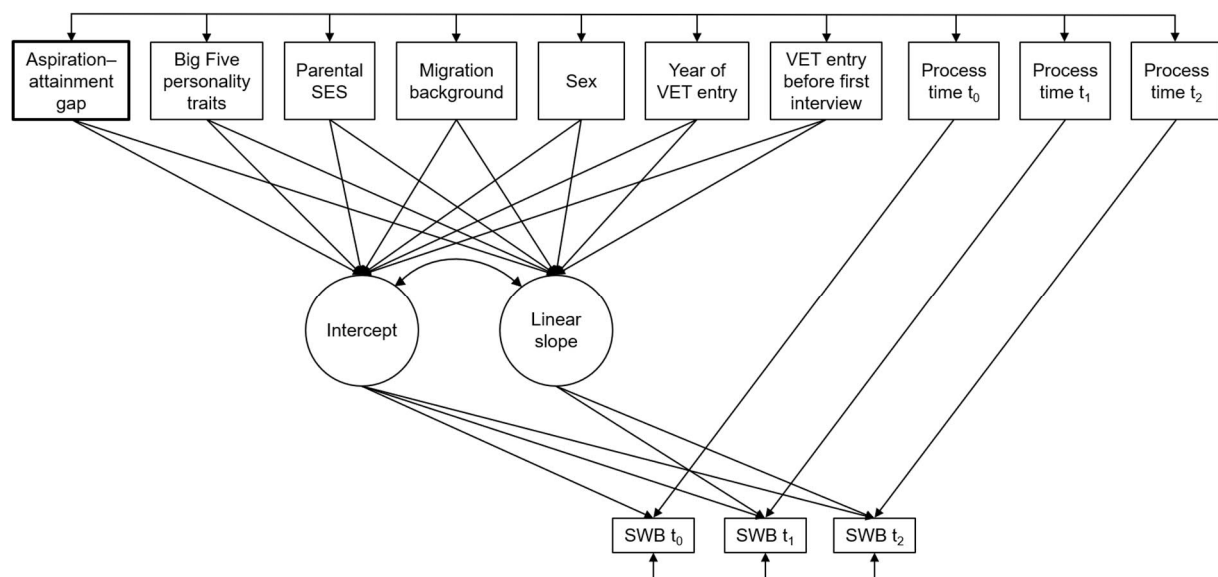
### 4.9.5 Appendix E

**Figure 4.E1:** *Depiction of the Third Latent Growth Curve Model (Model III)*

A



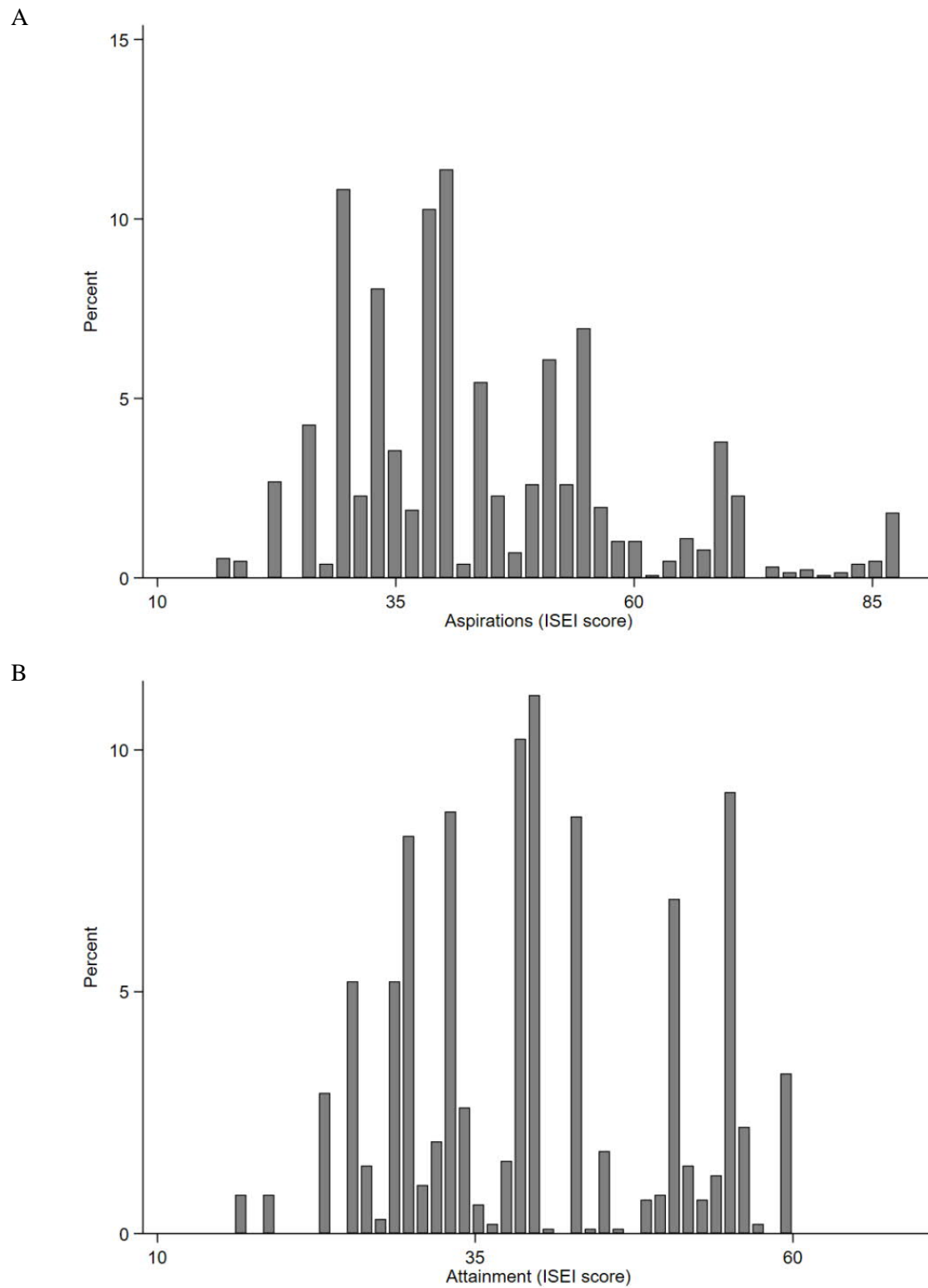
B



*Note.* SES = socioeconomic status, VET = vocational education and training, SWB = subjective well-being. A: Model with time-invariant predictors. B: Model with time-invariant and time-varying predictors.

### 4.9.6 Appendix F

**Figure 4.F1:** *Percentages of the Distribution of Aspirations and Attainment*



*Note.* ISEI = International Socio-Economic Index of Occupational Status. A: Distribution of aspirations ( $N = 1,265$ ). B: Distribution of attainment ( $N = 997$ ).



## 4.9.7 Appendix G

**Table 4.G1:** *Unstandardized Coefficients of the Latent Growth Curve Models for Three Domains of Subjective Well-Being Regressed on the Aspiration–Attainment Gap (Model II)*

	General life satisfaction			Job satisfaction			Income satisfaction		
	Threshold 0	Coef.	SE	Threshold +/–5	Coef.	SE	Threshold 0	Coef.	SE
Intercept ( $t_0$ ) on									
Underachievement	–0.274	0.130	.035	–0.269	0.133	.043	–0.336	0.167	.044
Overachievement	–0.474	0.190	.013	–0.400	0.249	.109	–0.651	0.264	.014
Intercept ( $t_2$ ) on									
Underachievement	–0.207	0.187	.267	–0.101	0.200	.614	–0.420	0.223	.060
Overachievement	–0.092	0.187	.622	0.071	0.219	.746	–0.112	0.299	.709
Linear slope on									
Underachievement	0.033	0.107	.757	0.084	0.113	.458	–0.042	0.127	.741
Overachievement	0.191	0.116	.099	0.235	0.138	.088	0.270	0.185	.145
Intercept–slope									
Covariance ( $t_0$ )	–0.241	0.143	.093	–0.234	0.146	.108	–0.477	0.293	.103
Covariance ( $t_2$ )	0.336	0.180	.061	0.330	0.179	.066	0.559	0.292	.055
Means									
Underachievement	0.333	0.016	<.001	0.276	0.015	<.001	0.333	0.016	<.001
Overachievement	0.149	0.013	<.001	0.094	0.011	<.001	0.149	0.013	<.001
Intercepts									
Intercept ( $t_0$ )	7.884	0.070	<.001	7.834	0.063	<.001	8.132	0.099	<.001
Intercept ( $t_2$ )	7.455	0.092	<.001	7.398	0.083	<.001	7.336	0.125	<.001
Linear slope	–0.214	0.055	<.001	–0.218	0.049	<.001	–0.398	0.079	<.001

(continued)

Table 4.G1 (continued)

	General life satisfaction			Job satisfaction			Income satisfaction		
	Threshold +/–5			Threshold 0			Threshold 0		
	Coef.	SE	p	Coef.	SE	p	Coef.	SE	p
<b>Variances</b>									
Underachievement	0.224	0.006	<.001	0.201	0.007	<.001	0.223	0.006	<.001
Overachievement	0.125	0.009	<.001	0.083	0.009	<.001	0.125	0.009	<.001
<b>Residual variances</b>									
Satisfaction $t_0$	1.192	0.232	<.001	1.201	0.234	<.001	1.078	0.452	.017
Satisfaction $t_1$	1.272	0.141	<.001	1.277	0.143	<.001	2.248	0.251	<.001
Satisfaction $t_2$	1.090	0.268	<.001	1.091	0.267	<.001	1.692	0.451	<.001
Intercept ( $t_0$ )	1.335	0.236	<.001	1.333	0.238	<.001	2.393	0.468	<.001
Intercept ( $t_2$ )	1.524	0.317	<.001	1.524	0.316	<.001	2.557	0.475	<.001
Linear slope	0.289	0.133	.030	0.282	0.134	.035	0.518	0.248	.037

Note.  $N = 1,536$ . Regression coefficients and intercept–slope covariances significant at the  $p < .05$  level are in bold type. Fit indices of models with aspiration–attainment gap (AAG) threshold of 0: general life satisfaction— $\chi^2(3) = 1.311$ ,  $p = .727$ , CFI = 1.000, RMSEA = .000, SRMR = .008, BIC = 27,123.527; job satisfaction— $\chi^2(3) = 5.099$ ,  $p = .165$ , CFI = .992, RMSEA = .021, SRMR = .021, BIC = 26,395.080; income satisfaction— $\chi^2(3) = 1.031$ ,  $p = .794$ , CFI = 1.000, RMSEA = .000, SRMR = .006, BIC = 27,730.384. Fit indices of models with AAG threshold of |5|: general life satisfaction— $\chi^2(3) = 2.086$ ,  $p = .555$ , CFI = 1.000, RMSEA = .000, SRMR = .010, BIC = 26.568,184; job satisfaction— $\chi^2(3) = 5.384$ ,  $p = .146$ , CFI = .989, RMSEA = .023, SRMR = .023, BIC = 25,837.174; income satisfaction— $\chi^2(3) = 1.187$ ,  $p = .756$ , CFI = 1.000, RMSEA = .000, SRMR = .006, BIC = 27,162.963.

## 4.9.8 Appendix H

**Table 4.H1:** *Unstandardized Coefficients of the Latent Growth Curve Models for Three Domains of Subjective Well-Being Regressed on the Aspiration–Attainment Gap and Covariates (Model III)*

	General life satisfaction			Job satisfaction			Income satisfaction		
	Threshold 0	Coef.	SE	Threshold +/–5	Coef.	SE	Threshold 0	Coef.	SE
Intercept (t <sub>0</sub> ) on									
Underachievement	–0.188	0.135	.163	–0.203	0.136	.137	–0.350	0.176	.046
Overachievement	– <b>0.436</b>	0.185	.018	–0.404	0.239	.091	– <b>0.651</b>	0.263	.013
Both groups <sup>a</sup>	– <b>0.270</b>	0.124	.030	–0.256	0.130	.050	– <b>0.452</b>	0.168	.007
Intercept (t <sub>2</sub> ) on									
Underachievement	–0.259	0.194	.181	–0.180	0.209	.389	–0.403	0.238	.090
Overachievement	–0.212	0.178	.235	–0.102	0.215	.634	–0.245	0.305	.422
Intercept (t <sub>0</sub> ) on									
Conscientiousness	<b>0.094</b>	0.041	.022	<b>0.100</b>	0.041	.014	0.095	0.061	.123
Extraversion	<b>0.084</b>	0.042	.047	<b>0.085</b>	0.042	.045	0.113	0.058	.052
Agreeableness	<b>0.218</b>	0.053	<.001	<b>0.215</b>	0.053	<.001	0.108	0.080	.176
Openness	0.082	0.049	.094	0.080	0.049	.104	0.029	0.076	.700
Emotional Stability	<b>0.164</b>	0.044	<.001	<b>0.169</b>	0.045	<.001	<b>0.166</b>	0.065	.011
Parental SES	0.002	0.004	.603	0.002	0.004	.551	–0.004	0.007	.520
Migration background	0.247	0.126	.050	0.240	0.125	.055	0.042	0.192	.826
Female	–0.082	0.095	.385	–0.070	0.095	.462	–0.170	0.140	.225
Post-economic crisis recovery	–0.125	0.111	.262	–0.128	0.110	.246	–0.190	0.158	.229
Pre-economic crisis	– <b>0.325</b>	0.119	.006	– <b>0.320</b>	0.117	.006	– <b>0.391</b>	0.166	.018
VET entry before 1st interview	<b>0.335</b>	0.105	.001	<b>0.342</b>	0.104	.001	–0.339	0.302	.262
Intercept (t <sub>2</sub> ) on									
Conscientiousness	–0.004	0.055	.945	0.002	0.055	.969	0.113	0.086	.192
Extraversion	0.073	0.058	.202	0.073	0.058	.207	0.045	0.087	.604
Agreeableness	0.097	0.073	.189	0.096	0.073	.193	<b>0.244</b>	0.101	.016
Openness	–0.018	0.067	.784	–0.025	0.067	.713	–0.017	0.095	.858
Emotional Stability	<b>0.306</b>	0.067	<.001	<b>0.306</b>	0.068	<.001	<b>0.194</b>	0.090	.031

(continued)

Table 4.H1 (continued)

	General life satisfaction			Job satisfaction			Income satisfaction		
	Coef.	SE	p	Coef.	SE	p	Coef.	SE	p
Intercept ( $t_2$ ) on									
Parental SES	-.005	0.006	.370	-.004	0.006	.466	-.029	0.008	<.001
Migration background	0.130	0.172	.449	0.143	0.174	.411	0.235	0.301	.435
Female	-.035	0.135	.794	-.030	0.136	.826	-.085	0.215	.693
Post-economic crisis recovery	-.0366	0.171	.032	-.0353	0.170	.038	-.0395	0.243	.104
Pre-economic crisis	-.0507	0.166	.002	-.0497	0.165	.003	-.1010	0.274	<.001
VET entry before 1st interview	-.0142	0.169	.401	-.0114	0.171	.506	0.168	0.252	.504
Linear slope on									
Underachievement	-.035	0.114	.756	0.011	0.120	.926	0.235	0.167	.160
Overachievement	0.112	0.113	.320	0.151	0.134	.259	0.161	0.198	.416
Both groups <sup>a</sup>	0.013	0.096	.889	0.049	0.102	.629	0.207	0.150	.168
Linear slope on									
Conscientiousness	-.049	0.032	.129	-.049	0.032	.128	0.066	0.059	.261
Extraversion	-.006	0.033	.867	-.006	0.033	.856	-.036	0.049	.460
Agreeableness	-.061	0.043	.159	-.060	0.043	.163	-.074	0.067	.267
Openness	-.050	0.040	.210	-.052	0.040	.187	-.103	0.065	.110
Emotional Stability	0.071	0.040	.075	0.068	0.040	.087	0.002	0.056	.969
Parental SES	-.004	0.003	.295	-.003	0.003	.340	0.002	0.005	.672
Migration background	-.058	0.106	.583	-.048	0.107	.652	0.059	0.179	.744
Female	0.024	0.079	.766	0.020	0.080	.801	0.032	0.129	.807
Post-economic crisis recovery	-.0121	0.098	.216	-.0112	0.097	.248	-.0181	0.145	.214
Pre-economic crisis	-.0091	0.100	.360	-.0088	0.099	.371	-.0188	0.159	.238
VET entry before 1st interview	-.0238	0.100	.017	-.0228	0.100	.023	-.0096	0.222	.667
Intercept–slope									
Covariance ( $t_0$ )	-.0185	0.108	.088	-.0179	0.135	.185	-.1067	0.353	.002
Covariance ( $t_2$ )	0.284	0.166	.087	0.282	0.165	.088	0.498	0.339	.142
Means									
Underachievement	0.347	0.016	<.001	0.289	0.015	<.001	0.351	0.016	<.001
Overachievement	0.152	0.013	<.001	0.096	0.011	<.001	0.152	0.013	<.001

(continued)

Table 4.H1 (continued)

	General life satisfaction						Job satisfaction						Income satisfaction					
	Threshold 0			Threshold +/-5			Threshold 0			Threshold +/-5			Threshold 0			Threshold +/-5		
	Coef.	SE	p	Coef.	SE	p	Coef.	SE	p	Coef.	SE	p	Coef.	SE	p	Coef.	SE	p
<b>Means</b>																		
Conscientiousness	4.951	0.028	<.001	4.951	0.028	<.001	4.951	0.028	<.001	4.951	0.028	<.001	4.951	0.028	<.001	4.951	0.028	<.001
Extraversion	4.900	0.032	<.001	4.900	0.032	<.001	4.900	0.032	<.001	4.900	0.032	<.001	4.900	0.032	<.001	4.900	0.032	<.001
Agreeableness	5.351	0.024	<.001	5.351	0.024	<.001	5.351	0.024	<.001	5.351	0.024	<.001	5.351	0.024	<.001	5.351	0.024	<.001
Openness	4.638	0.026	<.001	4.639	0.026	<.001	4.638	0.026	<.001	4.639	0.026	<.001	4.638	0.026	<.001	4.639	0.026	<.001
Emotional Stability	4.047	0.029	<.001	4.047	0.029	<.001	4.048	0.029	<.001	4.047	0.029	<.001	4.047	0.029	<.001	4.047	0.029	<.001
Parental SES	43.180	1.111	<.001	42.977	1.127	<.001	43.049	1.093	<.001	42.839	1.113	<.001	43.114	1.107	<.001	42.928	1.120	<.001
Migration background	0.189	0.010	<.001	0.189	0.010	<.001	0.189	0.010	<.001	0.189	0.010	<.001	0.189	0.010	<.001	0.189	0.010	<.001
Female	0.452	0.013	<.001	0.452	0.013	<.001	0.452	0.013	<.001	0.452	0.013	<.001	0.452	0.013	<.001	0.452	0.013	<.001
Post-economic crisis recovery	0.339	0.012	<.001	0.339	0.012	<.001	0.339	0.012	<.001	0.339	0.012	<.001	0.339	0.012	<.001	0.339	0.012	<.001
Pre-economic crisis	0.213	0.010	<.001	0.213	0.010	<.001	0.213	0.010	<.001	0.213	0.010	<.001	0.213	0.010	<.001	0.213	0.010	<.001
VET entry before 1st interview	0.233	0.011	<.001	0.233	0.011	<.001	0.233	0.011	<.001	0.233	0.011	<.001	0.233	0.011	<.001	0.233	0.011	<.001
<b>Intercepts</b>																		
Intercept ( $t_0$ )	4.689	0.457	<.001	4.610	0.453	<.001	6.193	0.632	<.001	6.091	0.627	<.001	3.080	0.828	<.001	3.066	0.816	<.001
Intercept ( $t_1$ )	6.001	0.620	<.001	5.890	0.615	<.001	6.202	0.764	<.001	5.984	0.754	<.001	3.866	0.887	<.001	3.872	0.881	<.001
Linear slope	0.656	0.376	.081	0.640	0.372	.086	0.004	0.497	.993	-0.054	0.490	.913	0.393	0.537	.465	0.403	0.533	.450
<b>Variances</b>																		
Underachievement	0.224	0.006	<.001	0.201	0.007	<.001	0.223	0.006	<.001	0.200	0.007	<.001	0.223	0.006	<.001	0.200	0.007	<.001
Overachievement	0.125	0.009	<.001	0.083	0.009	<.001	0.125	0.009	<.001	0.083	0.009	<.001	0.125	0.009	<.001	0.083	0.009	<.001
Conscientiousness	1.215	0.042	<.001	1.215	0.042	<.001	1.215	0.042	<.001	1.215	0.042	<.001	1.215	0.042	<.001	1.215	0.042	<.001
Extraversion	1.552	0.052	<.001	1.552	0.052	<.001	1.552	0.052	<.001	1.552	0.052	<.001	1.552	0.052	<.001	1.552	0.052	<.001
Agreeableness	0.856	0.032	<.001	0.856	0.032	<.001	0.856	0.032	<.001	0.856	0.032	<.001	0.856	0.032	<.001	0.856	0.032	<.001
Openness	0.993	0.033	<.001	0.993	0.033	<.001	0.993	0.033	<.001	0.993	0.033	<.001	0.993	0.033	<.001	0.993	0.033	<.001
Emotional Stability	1.309	0.044	<.001	1.309	0.044	<.001	1.309	0.044	<.001	1.309	0.044	<.001	1.309	0.044	<.001	1.309	0.044	<.001
Parental SES	347.583	14.889	<.001	347.121	14.505	<.001	348.672	14.728	<.001	347.736	14.365	<.001	346.969	14.804	<.001	346.421	14.453	<.001
Migration background	0.154	0.006	<.001	0.154	0.006	<.001	0.154	0.006	<.001	0.154	0.006	<.001	0.154	0.006	<.001	0.154	0.006	<.001
Female	0.248	0.001	<.001	0.248	0.001	<.001	0.248	0.001	<.001	0.248	0.001	<.001	0.248	0.001	<.001	0.248	0.001	<.001
Post-economic crisis recovery	0.224	0.004	<.001	0.224	0.004	<.001	0.224	0.004	<.001	0.224	0.004	<.001	0.224	0.004	<.001	0.224	0.004	<.001
Pre-economic crisis	0.168	0.006	<.001	0.168	0.006	<.001	0.168	0.006	<.001	0.168	0.006	<.001	0.168	0.006	<.001	0.168	0.006	<.001
VET entry before 1st interview	0.179	0.006	<.001	0.179	0.006	<.001	0.179	0.006	<.001	0.179	0.006	<.001	0.179	0.006	<.001	0.179	0.006	<.001

(continued)

**Table 4.H1** (continued)

	General life satisfaction						Job satisfaction						Income satisfaction					
	Threshold 0						Threshold 0						Threshold 0					
	Coef.	SE	p	Coef.	SE	p	Coef.	SE	p	Coef.	SE	p	Coef.	SE	p	Coef.	SE	p
Residual variances																		
Satisfaction $t_0$	1.202	0.206	<.001	1.211	0.224	<.001	0.974	0.442	.028	1.037	0.452	.022	1.874	0.522	<.001	1.905	0.528	<.001
Satisfaction $t_1$	1.262	0.137	<.001	1.266	0.137	<.001	2.286	0.244	<.001	2.284	0.245	<.001	2.638	0.243	<.001	2.646	0.243	<.001
Satisfaction $t_2$	1.127	0.228	<.001	1.130	0.264	<.001	1.716	0.441	<.001	1.738	0.447	<.001	1.745	0.507	.001	1.737	0.509	.001
Intercept ( $t_0$ )	1.137	0.217	<.001	1.133	0.222	<.001	2.363	0.451	<.001	2.312	0.453	<.001	5.079	0.558	<.001	4.939	0.568	<.001
Intercept ( $t_2$ )	1.336	0.298	<.001	1.339	0.297	<.001	2.047	0.472	<.001	2.074	0.473	<.001	3.942	0.554	<.001	3.960	0.560	<.001
Linear slope	0.234	0.069	.001	0.230	0.123	.060	0.511	0.239	.032	0.482	0.246	.050	0.783	0.290	.007	0.756	0.296	.011

*Note.*  $N = 1,536$ . SES = socioeconomic status, VET = vocational education and training. Regression coefficients and intercept–slope covariances significant at the  $p < .05$  level are in bold type. Fit indices of the models with aspiration–attainment gap (AAG) threshold of 0: general life satisfaction— $\chi^2(14) = 4.485$ ,  $p = .992$ , CFI = 1.000, RMSEA = .000, SRMR = .005, BIC = 64,039.694; job satisfaction— $\chi^2(14) = 21.242$ ,  $p = .096$ , CFI = .994, RMSEA = .018, SRMR = .015, BIC = 63,929.135; income satisfaction— $\chi^2(14) = 6.310$ ,  $p = .958$ , CFI = 1.000, RMSEA = .000, SRMR = .000, BIC = 65,265.732. Fit indices of the models with AAG threshold of .5: general life satisfaction— $\chi^2(14) = 5.370$ ,  $p = .980$ , CFI = 1.000, RMSEA = .000, SRMR = .000, BIC = 63,039.694; job satisfaction— $\chi^2(14) = 19.564$ ,  $p = .145$ , CFI = .995, RMSEA = .016, SRMR = .016, BIC = 63,377.329; income satisfaction— $\chi^2(14) = 6.252$ ,  $p = .960$ , CFI = 1.000, RMSEA = .000, SRMR = .014, BIC = 64,702.880.

<sup>a</sup> For further analyses, which we briefly address only in the discussion of our paper, we combined under- and overachievement in one group.