SOCIOECONOMIC (DIS)CONTINUITY ACROSS GENERATIONS:

The role of adolescent behavioral control and social competence
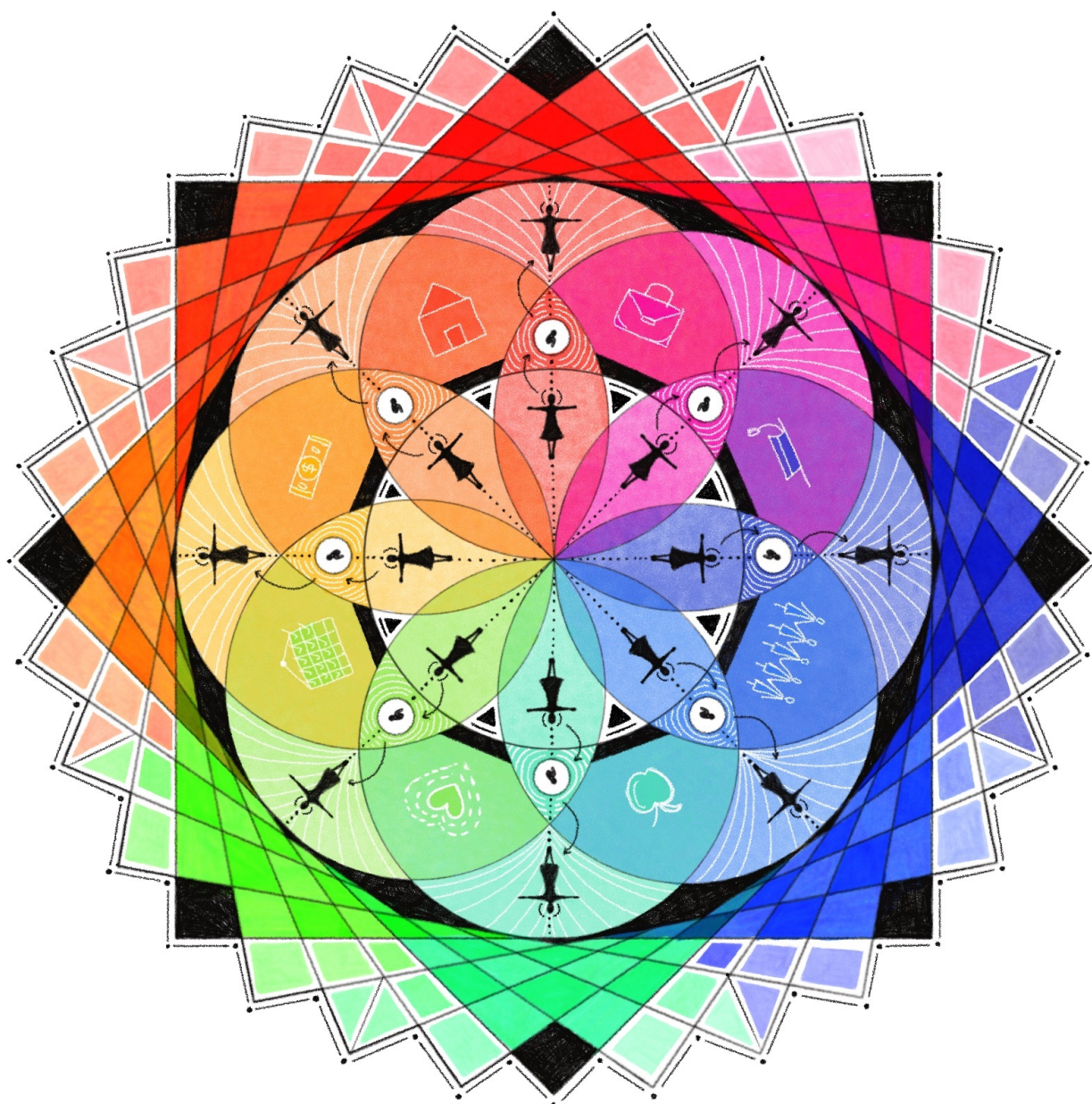

Matthijs Fakkel

Socioeconomic (dis)continuity across generations:

The role of adolescent behavioral control and social competence

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Socioeconomic (dis)continuity across generations:
The role of adolescent behavioral control
and social competence

Sociaaleconomische (dis)continuïteit tussen generaties:
De rol van gedragscontrole en sociale competentie bij adolescenten

(met een samenvatting in het Nederlands)

Proefschrift

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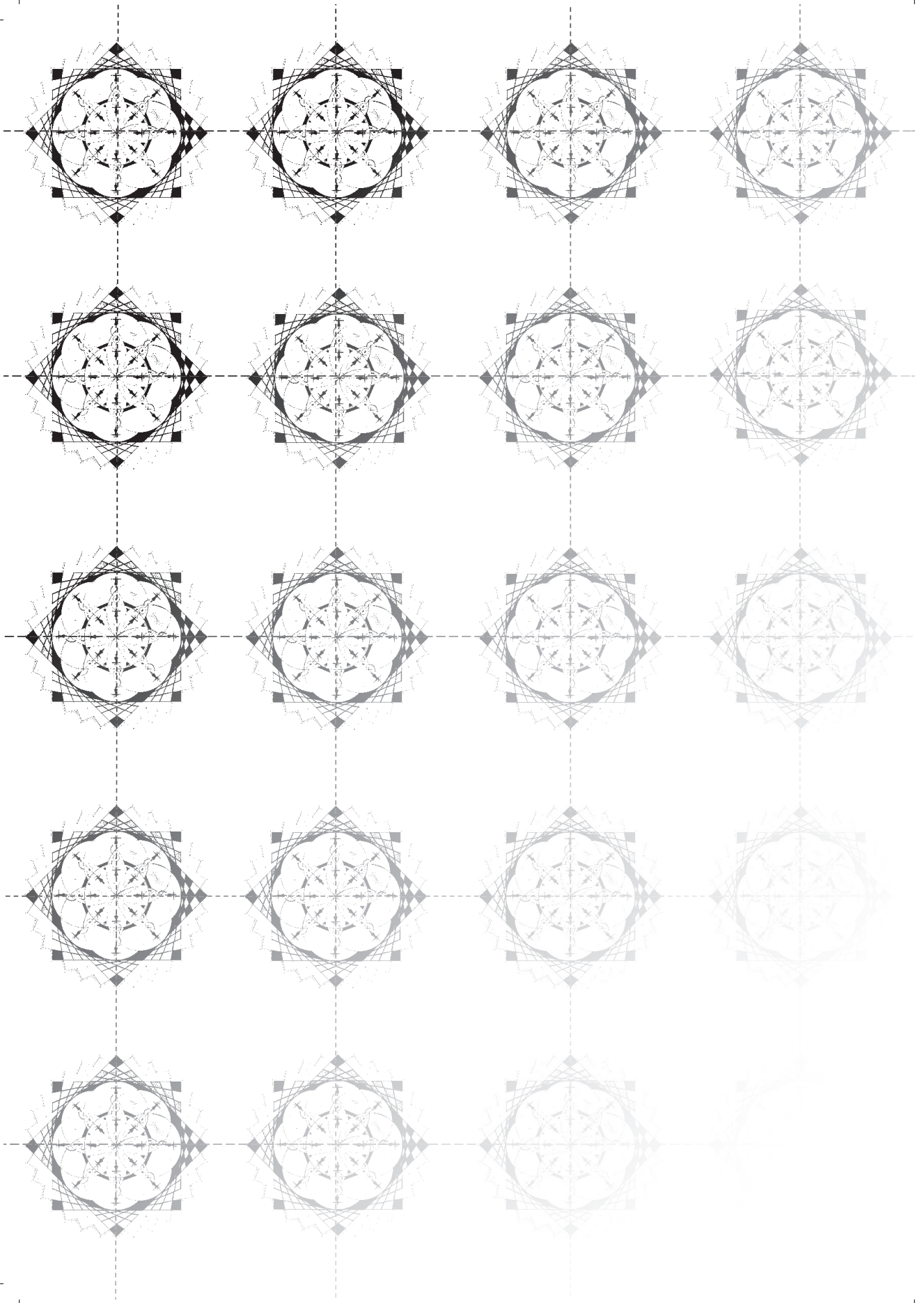**Matthijs Fakkel**
geboren op 15 augustus 1990
te Voorburg

I am what I am because of who we all are

– Desmond Tutu on the meaning of **Ubuntu**

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CHAPTER 1

GENERAL INTRODUCTION

Many adolescents attain a similar socioeconomic status (SES) in adulthood as their parents. This phenomenon of social reproduction is common in both the international context and in the Netherlands (OECD, 2018). For example, approximately half of Dutch adolescents attain a similar educational level as their parents and approximately 1 in 3 Dutch adolescents eventually end up in the same income quintile as their parents (Van den Brakel & Moonen, 2013; Weinberg et al., 2019). A considerable proportion of adolescents, however, experience social mobility: instead of ending up with a same SES as their parents, they move up or down the social ladder. Most modern societies strive to ensure that the SES which adolescents eventually attain is primarily the result of their own competencies, and not the result of the socioeconomic circumstances at birth (Sandel, 2021). Such a 'meritocratic' society is generally perceived to be more fair as well as efficient, compared to a more 'aristocratic' society (i.e., where SES in young adulthood is determined primarily by socioeconomic background of parents) (De Beer & Van Pinxteren, 2016; Heckman, 2006).

However, relatively little is known about which individual competencies help determine if adolescents experience social reproduction or social mobility. Our current lack of understanding makes it difficult to assess if mechanisms of social stratification – primarily the educational system – are indeed fair and effective (De Beer & Van Pinxteren, 2016). Consequently, it remains a challenge to identify effective policies that improve equality of opportunity. For example, in some societies that perceive themselves as meritocratic such as the U.S. (Fergusson et al., 2008) and the Netherlands (Zumbuehl et al., 2022), the educational level in which adolescents are stratified still largely depend on socioeconomic background (besides educational potential). Hence, a further exploration of individual competencies relevant for social reproduction and social mobility is essential for better understanding how adolescents attain their socioeconomic status as young adults. However, given the complex, expensive, and time demanding nature of longitudinal youth research, the role of adolescent competencies in social reproduction and social mobility has so far only been modestly investigated.

A number of studies have thus far identified cognitive competencies as an important factor for both social reproduction (De Neubourg et al., 2018) and social mobility (Deary, 2005). Adolescents with a higher parental SES on average have better cognitive competencies than adolescents with a lower parental SES, which in turn helps with attaining a higher educational level and a more specialized job with a higher income (Erola et al., 2016). Furthermore, having higher levels of cognitive competencies may benefit adolescents with a lower parental SES considerably more to overcome structural disadvantages towards attaining a higher young adulthood SES than adolescents with a higher parental SES (Forrest et al., 2011; Thijssen & Wolbers, 2016). As such, cognitive competencies appear to serve as a mechanism that links parental SES to young adulthood SES (i.e., mediator), while also being a potential factor to affect the strength of the

relationship between parental SES and young adulthood SES (i.e., moderator) (Judd et al., 2001). Such patterns are key for identifying a meritocratic society. However, even when taking parental SES and adolescent cognitive competencies into account, a considerable proportion of socioeconomic status attainment in young adulthood remains unexplained (Fergusson, 2008; Weinberg et al., 2019).

This suggests that there is more to adolescents' status attainment than their parental SES and cognitive competencies, but the role of other potentially relevant (non-cognitive) competencies remains somewhat elusive to date. An investigation of non-cognitive psychosocial competencies as possible factors in social reproduction and social mobility has received increased interest in recent years (Blanden et al., 2007; Bourne et al., 2018). For example, self-confidence, resilience, and positive emotionality have been found to be important adolescent factors in social reproduction (Mortimer et al., 2017; Alessandri et al., 2017; Senia et al., 2016). Some researchers even claim that such psychosocial competencies may be of greater relevance for social reproduction or social mobility than cognitive capabilities (Bowles & Gintis, 2002; Farkas, 2003), though this claim lacks extensive empirical testing.

Nonetheless, two constructs in particular – adolescent behavioral control and social competence – have shown promising but debatable associations with both parental SES and young adulthood SES (e.g., in a cross-sectional context or with limited control variables). Identifying psychosocial competencies (in addition to cognitive competencies) that potentially explain social reproduction or social mobility will provide novel empirical insights for assessing the meritocratic nature of the socioeconomic (dis)continuity across generations. The aim of this dissertation is therefore to explore a framework describing the potential role of adolescent behavioral control and social competence in the processes of social reproduction and social mobility (Figure 1.1).

Current sociological frameworks primarily focus on societal factors to understand how SES is transmitted across generations. Comparative studies between countries have helped identify rates of social reproduction and social mobility depending on wealth inequality (Corak, 2013), characteristics of different educational systems (Van Doorn et al., 2011), or demographic compositions (Shaw et al., 2016). For example, in societies with less wealth inequality and high investments in education, adolescents from a minority background have more opportunities to experience social mobility than in other societies. Some sociological frameworks also incorporate individual characteristics as possible explanations for SES transmission, though these tend to mostly be psycho-sociological in nature (Haller & Portes, 1973; MacLeod, 2018). For example, an individual's subjective socioeconomic status, occupational and educational aspirations, or cultural capital are a reflection of one's perceived opportunities in a particular society ("can someone *with my characteristics* make it?"), and somewhat less so reflects specific individual behaviors or competencies ("can someone *with my competencies* make it?"). Such psycho-sociological

factors tend to be positively associated with social reproduction (e.g., Rivenbark et al., 2020).

In contrast, psychological frameworks generally incorporate more extensive psychological measures (e.g., parenting behaviors; adolescent cognitive capabilities), but tend to focus exclusively on how socioeconomic background affects these psychological factors or how these psychological factors affect later socioeconomic status (Mossakowski, 2014). For example, social causation frameworks, such as the *family investment model* and the *family stress model*, describe how an abundance or lack of resources affects parenting behaviors, which in turn contribute to the (sub)optimal development of adolescent psychosocial competencies (Conger & Donnellan, 2007). Social selection frameworks, such as the *socio-ecological model of agency* or the *social gradient of self-control*, in turn describe how adolescents with a lowered sense of control or poorer behavioral control are at an increased risk of experiencing difficulties with completing their education and getting a job in young adulthood (Moffitt et al., 2011; Schoon & Lyons-Amos, 2017).

Some recent psychological frameworks do in fact investigate psychological factors in the intergenerational SES transmission, such as cognitive competencies (Bourne et al., 2018), personality traits (Ryberg et al., 2017), and internalizing and externalizing problem behaviors (Wickrama et al., 2005). Though such frameworks provide valuable insights, most of these psychological factors are either highly stable in nature with a strong genetic component (i.e., traits) or are pathological in nature, concerning a specific subsample of adolescents. Given the complex interplay between macro-level societal structures and micro-level individual characteristics, comprehensive frameworks that describe the role of adolescent psychosocial competencies in social reproduction and social mobility are somewhat scarce.

This dissertation aims to integrate sociological and psychological perspectives to better understand the role of specific adolescent psychosocial competencies – i.e., behavioral control and social competence – in the socioeconomic (dis)continuity across generations (see Figure 1.1). Such a framework may provide insights into how day-to-day expressions of behavioral control and social competence by adolescents at school, at home, and among peers may potentially explain part of the intangible, but highly relevant phenomena of intergenerational social reproduction and social mobility.

AIM OF DISSERTATION

This dissertation aims to further elucidate the role of adolescent behavioral control and social competence in intergenerational social reproduction and social mobility. A number of limitations have been observed in the literature regarding the key variables of

socioeconomic status, adolescent behavioral control and social competence, and social reproduction and social mobility, which we aim to address.

Different studies tend to find different rates of social reproduction and social mobility, which is partly due to how SES is conceptualized and measured (Ensminger & Fothergill, 2003). Prior to investigating factors affecting social reproduction and social mobility, it is important to consider how SES is perceived in this dissertation. While no general consensus seems to exist on the exact definition of SES, most researchers would agree that it refers to an individual's position within society, which determines access to financial, social, and informational resources (Lynch and Kaplan, 2000; Oakes and Rossi, 2003). A high SES context is generally characterized by affluence, predictability, and stability, whereas a low SES context is characterized by (relatively high levels of) scarcity, unpredictability, and instability (Kim-Spoon et al., 2017). Even though SES may be somewhat of an abstract construct, it has a strong influence on shaping adolescent's social environment, opportunities in life, and self-perception (Kraus et al., 2011).

The socioeconomic context in which adolescents grow up tends to be the result of the combined SES of both parents. A number of key indicators are commonly used to approximate an individual's SES: educational attainment, occupational status, and income (Moreno-Maldonado et al., 2018). Individuals who have attained a higher level of education or who have completed more years of education are more likely to obtain a specialized job with a higher income (Erola et al., 2016). SES may be subject to change over time, but generally stabilizes in one's late 40s (Black & Devereux, 2011). By then, the majority of people have stratified into occupational positions that they are likely to stay in until retirement. Some people may continue to move into more specialized, senior positions but such a shift will not considerably alter the socioeconomic hierarchy. Hence, parental SES tends to be rather stable, providing a consistent developmental context for children and adolescents.

In contrast, SES in young adulthood is still partly 'under construction' (Black & Devereux, 2011), with plenty of stratification processes still going on in the workplace. For example, young adults who completed vocational education tend to start working and earning earlier, but are also more likely to reach their 'career ceiling' earlier. In contrast, young adults with a theoretical education tend to enter the workforce somewhat later, with an income that initially lags behind, but eventually catches up, while also having more overall opportunities for career advancement (Mitchell & Syed, 2015). Despite this volatility of SES in young adulthood, it is an important construct for studying social reproduction and social mobility. Attaining an own socioeconomic position (i.e., graduating and starting a job) indicates a successful transition out of adolescence into adulthood, having an active, individual role in society with more self-reliance (Fong & Tsutsui, 2015). Furthermore, young adulthood SES also provides a peak into someone's potential SES in later adulthood. In this dissertation, we use various measures of SES

to assess their relative importance for understanding social reproduction and social mobility, and the extent to which psychosocial competencies affect this intergenerational transmission.

SES is generally measured by combining multiple indicators, such as mother's education and father's education, mother's occupation and father's occupation, and family income (as done in Chapters 4 and 5). Alternatively, combining at least two indicators – such as parents' educational attainment – instead of relying on one indicator also greatly improves the reliability of the SES measure (Chapter 3). While parents are generally well aware of their own SES indicators, adolescents may have difficulties in accurately identifying their parental SES. For example, adolescents might not know the modern-day equivalent of the educational level that their parents attained, or may be unaware of the total net family income per month (Currie et al., 1997). To prevent a high number of missing values and potentially wrong answers, asking adolescents about wealth characteristics of their household, such as number of bedrooms or number of laptops may be better suitable for estimating adolescents' parental SES (Chapter 2).

The adolescent developmental period is particularly relevant for studying social reproduction and social mobility, yet remains relatively understudied compared to childhood and adulthood. This disproportion in the literature may be driven by practical convenience (e.g., collecting retrospective, cross-sectional data among adults) or the theoretical assumption that socioeconomic investments are primarily impactful in childhood and become less impactful afterwards (Heckman, 2006). However, more so than children, adolescents have a strong desire for independence from their parents and autonomy over their choices (Arnett & Hughes, 2012). For example, adolescents start preferring to cycle to parties alone or with friends, and want to decide by themselves what clothes to wear. Besides socioemotionally, adolescents also socioeconomically start to move away slowly from under their parents' 'umbrella'. Adolescents are on track to complete a particular type of education that prepares them to enter the labor market and start becoming self-supporting individuals, with an own young adulthood socioeconomic status. In order to become independent and autonomous, and be effective at school, it is essential for adolescents to develop adequate psychosocial competencies (Casey & Caudle, 2013). The physical and social changes that take place during puberty provide optimal circumstances for adolescents to – eventually – establish appropriate levels of behavioral control and social competence. Given these characteristics, it is somewhat surprising that relatively few studies have further explored how social reproduction and social mobility may be shaped during the adolescent developmental period.

ADOLESCENT BEHAVIORAL CONTROL AND SOCIAL COMPETENCE

Behavioral control and social competence are important psychosocial characteristics for adolescents to develop, and have in previous studies been linked to both parental SES and young adulthood SES (e.g., Senia et al., 2016). Behavioral control essentially refers to how much control individuals can exert over their behavioral expressions (Muraven, 2010). On countless occasions during the day adolescents are expected to perform small acts of inhibiting inappropriate urges, thoughts, or feelings, and bringing their behaviors in agreement with social standards (Tangney et al., 2004). While making homework, for example, adolescents exercise two key aspects of behavioral control: 1) attentional control, that is, a prolonged focus on a particular task or topic; and 2) inhibitory control, that is, ignoring or overcoming the impulsive urge to for example send a funny meme or play a game instead of doing the task at hand (Maloney et al., 2012). Adolescents may need to display different aspects of behavioral control under different circumstances. For example, adolescents may need to regulate emotional outbursts during conflicts or refrain from excessive moving when taking an important exam (Kim et al., 2013; Zhou et al., 2012). Neurologically and physiologically, adolescents are more sensitive to instant gratification compared to children or adults (Galván, 2013). While that serves some purposes (e.g., exploring one's own boundaries), eventually, appropriate levels of behavioral control are required for adolescents in order to establish a socioeconomic position in society as young adults.

Another key characteristic during adolescence is social competence (Masten, 2007). Social competence refers to an adolescent's ability to engage in meaningful interactions with peers and adults, in an effective and appropriate way (Fabes et al., 2006; Rose-Krasnor, 1997). Socially competent adolescents have the ability to elicit positive social responses, and avoid negative ones, across various social contexts (Mash & Terdal, 1997). What characterizes a high level of social competence is the ability to combine separate social skills and appropriately apply them in a sequence, depending on situational demands. Such skills may involve empathy (Chapter 3), assertiveness (Chapter 5), and prosocial behavior (Chapter 6). At school for example, socially competent adolescents may use empathic skills and perspective taking to reconcile two friends who are having an argument, or may contribute to class discussions by asking classmates and teachers engaging questions. In contrast, adolescents with lower levels of social competence who experience difficulties with expressing themselves or understanding others, may end up having fewer friends, potentially be teased, and have less effective communication with teachers (Lodder et al., 2016). In this dissertation, we aim to extent the current literature assessing associations between parental SES, adolescent behavioral control and social competence, and young adulthood SES in a comprehensive longitudinal framework (Figure 1.1).

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SOCIAL REPRODUCTION AND SOCIAL MOBILITY

Relatively little is known about which individual-level factors are associated with the processes of social reproduction and social mobility. Adolescent psychosocial competencies, such as behavioral control and social competence, may be mechanisms through which SES is transmitted across generations (i.e., social reproduction). Adolescents with a higher parental SES generally display higher levels of behavioral control than adolescents with a lower parental SES (Ng-Knight & Schoon, 2017), which in turn tends to positively predict young adulthood SES outcomes, such as educational attainment (Andersson & Bergman, 2011). According to the *family investment model* and other materialist perspectives (Conger & Donnellan, 2007; Fergusson et al., 2008), parents with a higher SES have the financial and cultural resources to expose their children and adolescents to activities that implicitly require behavioral control (Weininger et al., 2015). Some examples include visits to the library, art expositions, theatre, cultural trips abroad; all of which involve normalizing behavioral control in various situations for varying periods of time. In a lower SES context, adolescents undertake less such activities and are more commonly expected to entertain themselves, with parents having relatively little time, energy, and attention left as a result of (impending) economic hardships (Lareau & Weininger, 2003).

Previous studies also give reasons to believe that adolescents with a higher parental SES display higher levels of social competence than adolescents with a lower parental SES, and adolescents with more social competence tend to attain a higher SES as adults (e.g., Bradley & Corwyn, 2002). Socioeconomic differences in adolescent social competence are mostly argued to be result of similar processes as those underlying socioeconomic differences in behavioral control (Bradley & Corwyn, 2002; Conger & Donnellan, 2007). Adolescents develop social competencies to an important extent through observation and socialization, as well as through direct parental instructions (Cano, 2019). Such social interactions prepare adolescents to function better at school, in terms of establishing positive relations with teachers and peers but also in terms of academic performance (Bandura et al., 2003; Stepp et al., 2011). The accumulated effects of such minor differences over time has repeatedly been argued to underlie part of the socioeconomic differences in adolescent behavioral control and social competence (Conger & Donnellan, 2007).

In turn, differences in behavioral control and social competence among adolescents may underlie the differences in young adulthood SES outcomes. For example, adolescents with higher levels of behavioral control are more likely to experience academic success, even after controlling for cognitive competencies or prior academic performance (Véronneau et al., 2014). Behavioral control is a particularly important competence for adolescents in tertiary education (e.g., university) to find a suitable balance between

the increased liberties and responsibilities relative to secondary education. For example regarding time management or prioritizing studying over socializing when necessary. Behavioral control has also been found to be a good predictor of occupational performance and financial well-being (Daly et al., 2015; Johnson et al., 2018; Strömbäck et al., 2017) – though arguably more relevant for some occupations than others (e.g., office jobs). Likewise, with employers valuing professional social interactions with colleagues and clients, socially competent adolescents are more likely to be employed as adults and earn a higher income (Deming & Kahn, 2017). Overall, adolescents who manage to develop appropriate levels of social competence grow up feeling valued, with a strong sense of belonging, and with plenty of opportunities to contribute to society (Gullotta et al., 1990).

Similarly, previous research suggests that adolescent psychosocial competencies such as behavioral control and social competence may affect adolescent's chances of experiencing social mobility. Adolescents with a lower parental SES may benefit considerably more from having high levels of behavioral control and social competence to overcome a number of structural disadvantages in their educational endeavors (e.g., lack of study materials, relatively high levels of stress and tension at home, distractions and temptations in the neighborhood, low teacher and societal expectations). Such adolescents can for example seek out motivating peers, helpful teachers, and resources that facilitate their academic endeavors, and in part compensates for socioeconomic disadvantages (Esping-Andersen & Cimentada, 2018). Likewise, adolescents with a higher parental SES but relatively weaker competencies would be expected to not remain in a high SES as young adults, but instead move into a lower, more appropriate socioeconomic position (Breen & Goldthorpe, 2001).

However, in the absence of a comprehensively tested framework including adolescent behavioral control and social competence as mediators in the longitudinal association between parental SES and young adulthood SES, earlier research findings can not indisputably reach an accurate conclusion. The suggested positive associations between key variables of interest may not hold up in a more complex, more realistic framework; and may therefore currently have limited validity for policy making (e.g., targeting inequalities of opportunity). Considering all of the aforementioned, four objectives can be specified for this dissertation: investigate the role of 1) adolescent behavioral control in social reproduction; 2) adolescent behavioral control in social mobility; 3) adolescent social competence in social reproduction; and 4) adolescent social competence in social mobility.

SAMPLE INFORMATION

To achieve our objectives, we analyzed data of over 14,000 adolescents from 7 datasets (Table 1.1), most of which were available for this dissertation through the Consortium of Individual Development (CID). CID aims to understand and predict how the interplay of child characteristics, and environmental factors results in individual differences in the development of social competence and behavioral control of the child. The consortium is a long-term collaboration between researchers across 6 developmental cohort studies: *RADAR* (Utrecht University), *TRAILS* (University Medical Centre Groningen), *Generation R* (Erasmus University), *L-CID* (Universiteit Leiden), *NTR* (VU Amsterdam), and *YOUth* (Utrecht University and University Medical Centre Utrecht).

The longitudinal data from RADAR and TRAILS has been particularly central to this dissertation (i.e., used in all chapters, except for Chapter 2). *RADAR* is a longitudinal cohort study that investigates interactions and conflicts of adolescents with parents and peers, emotional development, identity, and internalizing and externalizing problem behavior (Van Lier et al., 2008). Participants have been recruited through elementary schools in the Utrecht municipality (i.e., mid-Netherlands) and 4 large cities elsewhere. At baseline, adolescents ($N = 497$) were around age 13. *TRAILS* is a general population cohort study that aims to understand (the interaction between) determinants of mental health and social development during adolescence and young adulthood (Huisman et al., 2008; Oldehinkel et al., 2015). Adolescents around the age of 11 ($N = 2,229$) were recruited from urban and rural areas in the northern region of the Netherlands. Data of the other CID cohorts *Generation R, L-CID*, *NTR*, and *YOUth* have been analyzed in Chapter 6, but not other chapters.

Besides the CID cohorts, we used data from the *Youth Got Talent* project (Utrecht University), in Chapter 2. *Youth Got Talent* is an ongoing longitudinal study on late adolescent wellbeing. Adolescents in this study ($N = 689$; aged 16+) attended classes in three vocational schools in the region of Utrecht in the Netherlands and participated in training in fields such as creative, technical, and health education. While the first wave of data was collected in the physical classroom, the second wave of data was collected in the online classroom during the covid-19 lockdown.

METHODOLOGICAL APPROACH

Our main objective is to understand if adolescent psychosocial competencies can explain how the SES of young adults relates to the SES of their parents. For this purpose, we will specifically investigate:

1. The role of adolescent behavioral control in social reproduction
2. The role of adolescent social competence in social reproduction
3. The role of adolescent behavioral control in social mobility
4. The role of adolescent social competence in social mobility

Each of the next five chapters serve to answer one or more of these objectives.

A considerable part of this dissertation was constructed during covid-19. This global pandemic provided unique opportunities for studying differences in vulnerabilities between adolescents from different socioeconomic backgrounds. In **Chapter 2** specifically, we investigated socioeconomic differences in adolescent future orientations, parental support, and sense of control; and in particular, if these socioeconomic differences increased during the covid-19 lockdown. Using Latent Change Score models, we obtained insights into adolescent and parent psychosocial factors associated with projected social reproduction and social mobility.

Chapter 3 is central for understanding the role of parent and adolescent psychosocial competencies in social reproduction. More specifically, *RADAR* data was used to investigate if the intergenerational transmission of SES is mediated by the intergenerational transmission of conflict behaviors. Using structural equation modeling and serial mediation analyses, we tested if associations between parental SES and young adulthood SES at age 26 were mediated by associations between parental constructive and destructive conflict behaviors, and adolescent's constructive and destructive conflict behaviors, emotion regulation and empathy at age 16.

Chapters 4 and 5 (both utilizing *TRAILS* data) mainly serve to better understand the role of adolescent behavioral control and social competence in social mobility, while also providing insights into social reproduction. In **Chapter 4**, we investigated if parental SES and family support are predictors of educational level (at age 16 and age 26), and if these associations are buffered by adolescent effortful control and peer support (at ages 11 and 16). Two multinomial logistic regressions were performed, from early to mid-adolescence and from mid-adolescence to young adulthood, to also investigate potential differences between developmental periods. As a result of imputing missing data and running several sensitivity analyses, Chapter 4 offers robust insights regarding the role of adolescent and parent psychosocial factors in the process of social reproduction.

Chapter 5 aims to identify early adolescent predictors of social mobility in young adulthood. More specifically, categories of parental SES (Low/Mid/High) and educational attainment in young adulthood (Low/Mid/High) were combined to create a total of six social mobility groups (e.g., Low/High) and three social reproduction groups (e.g., Mid/Mid). Multinomial logistic regressions and post-hoc group comparisons were analyzed to contrast scores on effortful control, assertiveness, peer competence, and intelligence in early adolescence (age 11) between adolescents in mobility groups (e.g., Low/High) and their respective social reproduction group (i.e., Low/Low and High/High).

In **Chapter 6**, we analyzed all 6 CID cohorts to see if an undersampling of families with a low SES may overestimate what is considered normative behavioral control and social competence. A raking procedure was used to bring the SES distribution of the developmental cohorts in line with the Dutch population. Though estimates of normative behavioral control and social competence remained unchanged after raking, the analyses provide us with indispensable insights regarding the extent to which families with a low SES are undersampled and are likely to not be fully representative of the low SES population, and the limits of statistical procedures – such as raking – to compensate for non-inclusion and attrition. As such, Chapter 6 addresses a recurring concern in all previous chapters, and helps place our findings in the right context. For each empirical chapter, we have visualized their contribution to the interdisciplinary framework as a whole (Figures 1.2 to 1.6). For parsimony sake, the diagrams lack important details, which can be found in Tables 1.1, and the chapters themselves.

These high-quality datasets that were available for this dissertation also allow to follow up on some previous suggestions to improve future research. For example, the large number of adolescents that have been willing to partake in our studies allow for the inclusion of multiple psychosocial competencies from both adolescents and parents in our models – instead of testing single competencies, or having to cluster multiple competencies into a single construct, or limiting the number of control variables to prevent power issues (Durham et al., 2007; Schofield et al., 2011; Senia et al., 2016). Furthermore, all of our studies on social reproduction and social mobility go beyond cross-sectional analyses, resulting in a more accurate insight into the strength and sequence of associations (Scheeren et al., 2017). All of these advancements will help improve our understanding of the relevance of adolescent psychosocial competencies in social reproduction and social mobility.

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Table 1.1 *Sample Information per Chapter.*

Chapter	Title	Sample (Waves)	Sample Characteristics		Contribution to Dissertation
2	Decline in positive future orientations among adolescents during covid-19: The role of socioeconomic status, parental support, and sense of control	Youth Got Talent (T1 and T2)	$N = 698$, $Age_{T1} = 17.8$, 56.0% girls		To investigate if parental support and sense of control explain (projected) social reproduction (i.e., SES-related future orientations), during a crisis situation (i.e., covid-19 lockdown)
3	Parent-adolescent transmission of socioeconomic status: Testing serial mediation of conflict behaviors, emotion regulation, and empathy	RADAR (T1, T2, and T10)	$N = 320$, $Age_{T1} = 13.0$, 47.8% girls		To investigate if parental conflict behaviors and adolescent conflict behaviors, emotion regulation, and empathy explain social reproduction
4	Parental SES and family support as predictors of educational level: Testing the buffering effect of effortful control and peer support	TRAILS (T1, T3, and T6)	$N = 2175$, $Age_{T1} = 11.1$, 50.8% girls		To investigate if effortful control and peer support in explain social mobility in mid-adolescence and young adulthood
5	Intergenerational upward and downward social mobility: The role of intelligence, effortful control, assertiveness, and peer competence in early adolescence	TRAILS (T1 and T6)	$N = 2229$, $Age_{T1} = 11.1$, 50.8% girls		To investigate if intelligence, effortful control, assertiveness, and peer competence in early adolescence explain social mobility in young adulthood
6	Testing sampling bias in estimates of adolescent social competence and behavioral control	RADAR (T1) TRAILS (T2) Generation R (T4) L-CID (T3) NTR (T5) YOUth (T1)	$N = 441$, $N = 1535$, $N = 3895$, $N = 142$, $N = 6266$, $N = 595$,	$Age_{T1} = 13.0$, $Age_{T1} = 13.5$, $Age_{T1} = 9.7$, $Age_{T1} = 9.5$, $Age_{T1} = 9.9$, $Age_{T1} = 9.5$, 44.2% girls 50.4% girls 50.1% girls 52.8% girls 50.3% girls 54.5% girls	To investigate if an undersampling of families with a low SES potentially affects our understanding of the role of adolescent psychosocial competencies in social reproduction and social mobility
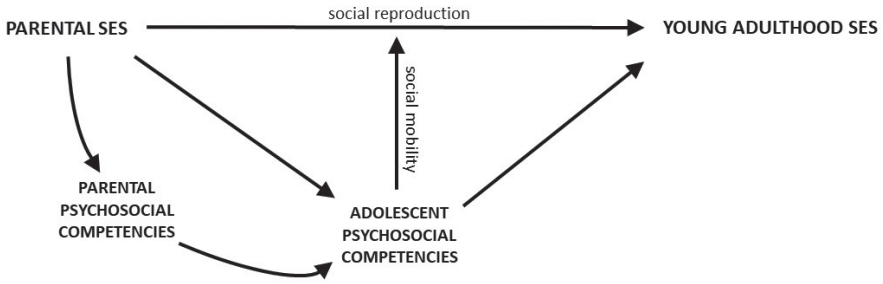
Figure 1.1 *Interdisciplinary framework for understanding the role of adolescent and parental psychosocial competencies in the intergenerational transmission of SES.*
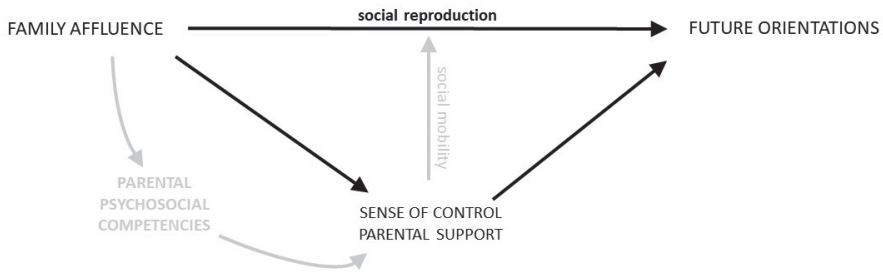
Figure 1.2 *Contribution of Chapter 2 to our interdisciplinary framework of intergenerational SES transmission.*
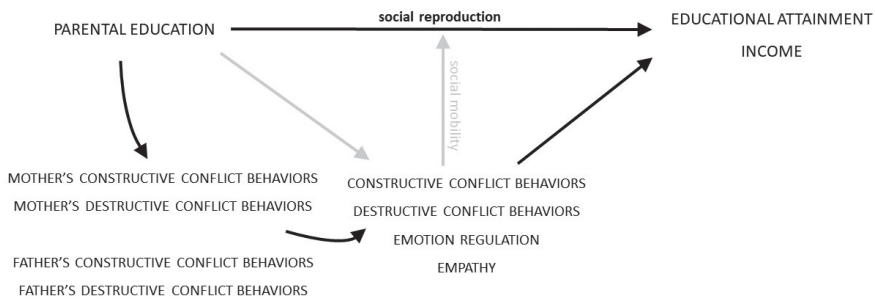
Figure 1.3 *Contribution of Chapter 3 to our interdisciplinary framework of intergenerational SES transmission.*
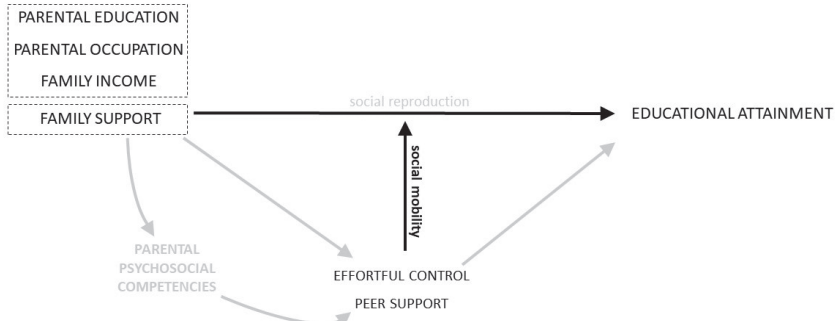
Figure 1.4 *Contribution of Chapter 4 to our interdisciplinary framework of intergenerational SES transmission.*
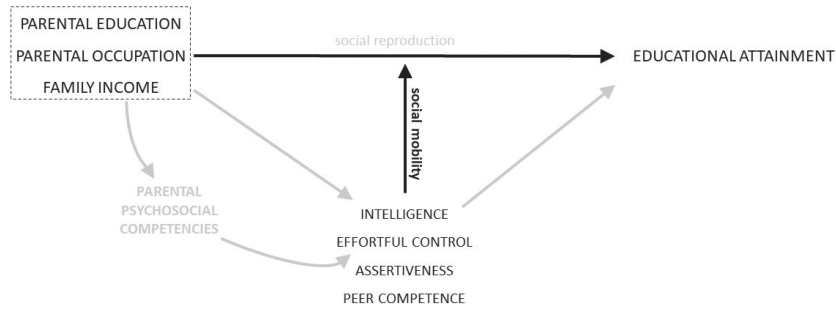
Figure 1.5 *Contribution of Chapter 5 to our interdisciplinary framework of intergenerational SES transmission.*
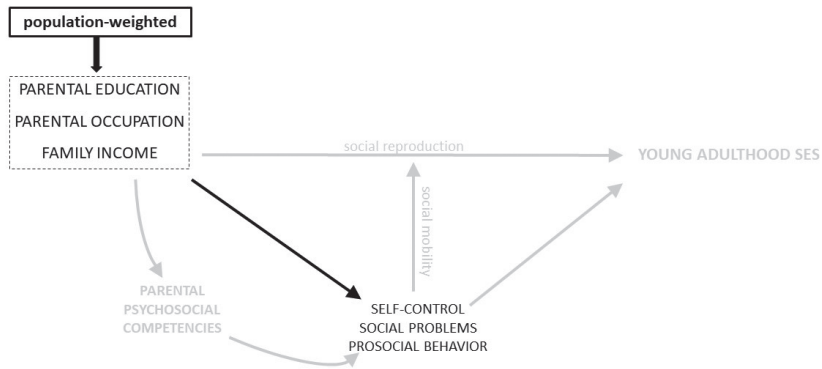
Figure 1.6 *Contribution of Chapter 6 to our interdisciplinary framework of intergenerational SES transmission.*

CHAPTER 2

DECLINE IN POSITIVE FUTURE ORIENTATIONS AMONG ADOLESCENTS DURING COVID-19:

THE ROLE OF SOCIOECONOMIC STATUS, PARENTAL SUPPORT, AND SENSE OF CONTROL

Author Contributions:

MF: Investigation, Conceptualization, Methodology, Formal analysis, Writing – original draft, Writing – review & editing, Visualization.

MP: Conceptualization, Methodology, Writing – original draft, Writing – review & editing.

SB: Conceptualization, Methodology, Writing – original draft, Writing – review & editing.

GWJMS: Project administration, Investigation, Conceptualization, Methodology, Supervision, Writing – original draft, Writing – review & editing.

WAMV: Conceptualization, Methodology, Writing – original draft, Writing – review & editing

ABSTRACT

Introduction: Before coronavirus disease (covid-19), adolescents from a lower socioeconomic status (SES) background tend to have less positive future orientations, receive less parental support, and have a weaker sense of control than adolescents from a higher SES background. The covid-19 pandemic has potentially increased the socioeconomic gaps in positive future orientations, parental support, and sense of control among adolescents who are currently in vocational education. As societies are aiming to return back to pre-covid norms, certain groups of adolescents might require more attention for ensuring a stable future than others.

Method: Two-wave questionnaire data of 689 Dutch adolescents (M_{age} = 17.8; 56% female) from the Youth Got Talent project was analyzed. Latent Change Score models are a relatively novel approach that allows two-wave data to estimate associations between pre-covid predictor variables and changes in outcome variables from before to during covid-19 (e.g., SES, positive future orientations, parental support, and sense of control). Analyses were preregistered.

Results: The pre-covid socioeconomic differences in adolescent's positive future orientations and sense of control remained stable during covid-19, whereas the socioeconomic difference in parental support decreased during covid-19. A decline in parental support, an increase in sense of control, and more covid-19 hardships were associated with an increase in future orientations.

Conclusion: The covid-19 situation has not substantially increased socioeconomic differences in positive future orientations and sense of control, but did decrease socioeconomic differences in parental support among adolescents. Short-term policies should aim to facilitate parental support and positive future orientations to all adolescents who experienced a decline, while also long-term focusing on the more consistent socioeconomic difference in sense of control among adolescents.

Keywords: socioeconomic status (SES); adolescent development; covid-19; future orientations; sense of control; parental support

INTRODUCTION

At the early stages of the coronavirus disease (covid-19) pandemic, initial economic predictions for the nearby future of the Netherlands and other Western countries indicated a potential shortage of jobs, a tight housing market, and fewer social securities overall; all of which are expected to hit young vocational workers first and foremost (CPB, 2020a; OECD, 2020). As such, the covid-19 pandemic can potentially delay or obstruct the realization of future orientations (such as a stable job or family planning) for this generation of adolescents currently in vocational education tracks. Future orientations reflect the expectations, aspirations, and behavioral plans that adolescents have regarding their future, for example, in terms of career, family planning, but also about the self and society (Seginer, 2003). Having positive future orientations helps adolescents to display more goal-directed behavior (Johnson et al., 2014), less risk behavior (Steinberg, 2008), and in the long term positively predicts educational attainment (Beal & Crockett, 2010) and occupational prestige (Dubow et al., 2009). Having positive future orientations can therefore help adolescents to realize future goals, and transition successfully into adulthood. In this study, we assessed if adolescents' future orientations were less positive during the covid-19 pandemic than before; and if this potential decline in future orientations is greater for adolescents from a lower compared to a higher socioeconomic status (SES). Furthermore, we assessed the extent to which adolescents' parental support, sense of control, and covid-19 related hardships can explain the relation between SES and changes in future orientations.

Socioeconomic differences in future orientations before covid-19

The socioeconomic background of adolescents is an important factor that shapes the psychosocial developmental context (Bourdieu, 1984; Howard et al., 2011). It reflects access to resources, information, and social connections, as well as power and prestige (Hoff et al., 2002; Oakes & Rossi, 2003). For example, parents with a higher SES background are more likely to have a permanent job, a stable and comfortable income, and be homeowners. In contrast, parents with a lower SES background are more likely to be on a temporary employment contract, with (a below) average income that might fluctuate, and be house tenants (Desmond & Gershenson, 2016). In a low-SES context, adolescents and their families are more likely to experience economic hardships, unpredictability, instability, and higher levels of family stress (Conger & Donnellan, 2007).

Such characteristics of a low-SES environment affect individuals' psychological outlook on life, with a predominant focus on resolving immediate threats, handling current demands, and less attention to long-term planning – also known as "contextualism" (Kraus et al., 2012). In contrast, a high-SES context tends to be characterized by financial

affluence, predictability, stability, and relatively low levels of family stress (R. D. Conger & Donnellan, 2007). Such characteristics of a high-SES context foster a psychological outlook in individuals that revolves around long-term personal goals and development – or "solipsism" (Kraus et al., 2012). Adolescents with a higher SES background are psychologically inclined to think about the future more often, in more detail, and with more optimism (Eshelman & Rottinghaus, 2015), whereas adolescents with a lower SES background facing precarity are more likely to restrain their time perspective to the present and leave out the future (Fieulaine & Apostolidis, 2015). Previous studies indeed suggest that adolescents from a higher SES background had a more positive future outlook (Nurmi, 1991), more future educational aspirations (Kao & Tienda, 1998), more future occupational aspirations (Howard et al., 2011), and less fatalistic future orientations (Guthrie et al., 2009) than adolescents from a lower SES background. Furthermore, parents with a higher SES themselves have more positive future orientations (Guthrie et al., 2009), and encourage their adolescents to hold similar positive future orientations (Kerpelman & Mosher, 2004). Family SES is therefore an important factor in developing positive future orientations during adolescence.

Previous studies suggest that the positive relationship between SES and adolescent's future orientations can in part be explained by experiences of parental support and sense of control. Adolescents from low-SES families tend to receive less parental support than those from high-SES families (Goosby, 2007). According to the *family stress model* (R. D. Conger & Donnellan, 2007), economic hardships cause chronic stress, tension, and arguments among parents. Experiences of economic hardships and scarcity – which are more common among lower SES than higher SES families – frequently demand attention, making parents less available to their adolescent (Mani et al., 2013; Shah et al., 2012). Ultimately, heightened levels of stress as a result of economic hardships push parents toward harsher child-rearing behaviors, a poorer appraisal of the adolescent's socioemotional needs, and less support (Cohen et al., 2008; Conger et al., 2010). Parental support can for example be experienced in the form of unconditional acceptance, empathic listening, and providing encouragement when adolescents are having a difficult time (Nurmi, 1991). Such experiences of parental support help adolescents to contemplate their future orientations with more optimism and motivation, and in more detail (McCabe & Barnett, 2000).

A high-SES context of affluence, stability, and predictability facilitates adolescents in consistently achieving social and educational goals through their own efforts, which nurtures a strong sense of control, referring to the perception that their own efforts result in desired future outcomes (Conger et al., 2009). In contrast, in a low-SES context – characterized by scarcity, instability, and unpredictability – adolescents may experience more difficulties in accomplishing social and educational goals despite considerable efforts, which nurtures a diminished sense of control and the feeling

that external factors such as fate, luck, or other people control the course of their life (Manstead, 2018). Adolescents with a stronger sense of control are optimistic about the availability of resources in the nearby future, and have a strong belief that those resources can effectively be accessed (Lachman & Weaver, 1998). As such, growing up in a lower SES background can foster a weaker sense of control in adolescents, who might subsequently set less positive future orientations compared to adolescents from a higher SES background.

Socioeconomic divergence in future orientations during covid-19

The covid-19 pandemic has strengthened and even increased social inequalities globally (Stiglitz, 2021), including in the Netherlands (CPB, 2020b; SCP, 2020). Families from lower socioeconomic backgrounds are more negatively affected by the pandemic and lockdown regulations than those from higher socioeconomic backgrounds (Brooks et al., 2020). Individuals with a lower SES typically are more exposed to the virus as essential vocational workers (e.g., in nursing, public transport, supermarkets) that are expected to come to their workplace whereas individuals with a higher SES are facilitated to perform their white-collar jobs from home. Individuals with a lower SES are also more likely to lose their job or see their income reduce, and have fewer buffers to maintain the same living standards over an extended period of time before incurring debt, compared to their higher SES counterparts (Matthews et al., 2010). While higher SES families will also be challenged to make adjustments during the lockdown, the contextual levels of affluence, stability, and predictability are fundamentally less affected.

As a consequence, the educational and social challenges during covid-19, and in particular during lockdown, are expected to be larger among adolescents from lower SES families than among adolescents from higher SES families. For example, adolescents from higher SES families quarantine in a larger house with the privacy of their own bedroom, laptop, and stable internet connection to stay in touch with teachers and peers, whereas adolescents from a lower SES background quarantine in a smaller house, share rooms and devices with siblings, and may have a poorer internet connection resulting in substandard educational and social interactions (Koenig et al., 2021). Consequently, adolescents from a higher SES family can more effectively adjust to novel requirements toward realizing their future orientations compared to adolescents from a lower SES family, for example, a smooth transition from offline to online education.

This anticipated stronger decline in positive future orientations among lower SES adolescents compared to higher SES adolescents is expected to be driven in part by a similar stronger decline in parental support and sense of control. The family environment will, due to covid-regulations, become the primary source of real-life social interactions for adolescents (Donker et al., 2021), instead of their peers, meaning that the (lack of)

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support that parents offer is relatively more impactful on adolescent's positive future orientations than before the lockdown. Furthermore, material constraints that prevent adolescents from lower SES families to transition from offline to online school and social life may negatively affect their sense of control (Low & Mounts, 2022), in addition to the decline in sense of control that adolescents may already experience as a result of lockdown regulations and uncertainties.

Present Study

Four research questions are central in this study: (RQ1) Do socioeconomic differences in adolescent's positive future orientations increase during covid-19 compared to before?; (RQ2) Do socioeconomic differences in parental support explain changes in positive future orientations?; (RQ3) Do socioeconomic differences in sense of control explain changes in positive future orientations?; and (RQ4) Do socioeconomic differences in covid-19 related hardships explain changes in positive future orientations? With regard to the first research question, we expected adolescents from a lower SES background to have less positive future orientations before covid-19 compared to adolescents from a higher SES background (H1.1); and a stronger decline in positive future orientations during covid-19 among adolescents from a lower SES compared background compared to adolescents from a higher SES background (H1.2). Similarly, we expect adolescents from a lower SES background to receive less parental support (H2.1) and have a lower sense of control (H3.1) before covid-19 compared to adolescents from a higher SES background; and a stronger decline in parental support (H2.2.) and sense of control (H3.2) during covid-19 among adolescents from a lower SES compared background compared to adolescents from a higher SES background. Furthermore, we expected adolescents from a lower SES background to report more covid-19 related hardships than adolescents from a higher SES background (H4).

METHOD

Participants and procedure

We used data from the Youth Got Talent project, an ongoing longitudinal study on late adolescent well-being. Adolescents in this study (aged 16+) attended classes (k = 72) in three vocational schools in the region of Utrecht in the Netherlands and participated in training in fields such as creative, technical, and health education. This type of tertiary education prepares adolescents for a specific, practical vocation. In the Dutch educational system, it is commonly referred to as "intermediate vocational education," ranking

higher than lower vocational education or special education, but ranking lower than higher vocational education or university education on the educational ladder (also see Schmengler et al., 2021). The adolescents in our study are the vocational workers of the future, who are essential to society and economy, but who may also be found in a precarious situation (Standing, 2015) – particularly during a pandemic and its aftermath. Our sample, therefore, aims to be specifically representative of Dutch adolescents in intermediate vocational education.

A total of $N = 1372$ adolescents participated in the two waves of data collection. Between October 2019–January 2020 (T1), $n = 1231$ adolescents participated and roughly 6 months later in May–June 2020 (T2), $n = 830$ adolescents participated. Most adolescents ($n = 689$) participated at both time points, but some adolescents only participated in either the first wave ($n = 542$) or the second wave ($n = 141$). Data from all $N = 1372$ adolescents were used in the main analyses.

Of the $n = 1231$ participating adolescents at T1, 47 adolescents did not fill out the future orientations questionnaire (3.8%), 52 adolescents did not fill out the parental support questionnaire (4.2%), and 45 adolescents did not fill out the sense of control questionnaire (3.6%). Of the $n = 830$ participating adolescents at T2, 29 adolescents did not fill out the future orientations questionnaire (3.5%), 31 adolescents did not fill out the parental support questionnaire (3.7%), and 27 adolescents did not fill out the sense of control questionnaire (3.2%). Furthermore, 19 adolescents did not fill out the covid-19 hardships questionnaire at T2 (2.3%).

We compared demographic characteristics of adolescents who participated at both time points ($n = 689$) to adolescents who participated only at T1 ($n = 542$). Adolescents who dropped out were older ($M_{diff} = 0.35$, $t(1225) = 3.36$, $p < .01$), were more likely to be male ($\chi^2(2) = 17.54$, $p < .001$), and more likely to have a lower SES background ($\chi^2(2) = 16.87$, $p < .001$). Adolescents who dropped out reported similar scores on positive future orientations, parental support, and sense of control before covid-19 as adolescents who participated in both waves. The missing data in our data set was not missing completely at random (Little's MCAR test; $\chi^2(511) = 824.9$, $p < .001$). Considering the attrition pattern in our sample, missing data were assumed to be at least partially missing at random. Missing data were handled using full information maximum likelihood estimations in our structural equation model.

At both time points, adolescents were registered in the same class with the same mentor. Roughly a quarter of the classes that participated before covid-19 did not participate during covid-19, and within participating classes, the adolescent response rate was over 65% (with about 15% of the nonresponding adolescents dropping out of school before T2). Researchers administrated self-report questionnaires in the classroom (T1) or during online lessons (T2) and these took about 20–30 min to complete. Adolescents gave active consent and were informed that data would be anonymized. Ethical approval

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was gained from the Ethics Assessment Committee of the Faculty of Social Sciences at Utrecht University (FETC18070) in 2018 and updated in 2020. Most adolescents had an age between 16 and 21 years old before covid-19 (M_{age} = 17.8, SD = 1.82); and 56% were female.

MEASURES

Socioeconomic status

A participant's SES was measured using the Family Affluence Scale (FAS) (Currie et al., 1997; Torsheim et al., 2016). The FAS consists of six items (e.g., "Does your family own a car/van?"), with answer categories indicating quantity (e.g., "Yes/No"; "One/Two/Three"). A rankit transformation was performed on the sum scores to obtain standardized SES scores between 0 and 1, with a higher score indicating a higher SES. FAS is a composite indicator, constructed of separate independent items indicating family material assets, so internal consistency between items is not necessary (Boyce et al., 2006).

Positive future orientations

A participant's positive future orientations were measured using eight statements on adulthood goals (e.g., "How big do you think is the chance that you get a well-paying job?") and eight statements on feelings about the future (e.g., "Enthusiasm"; "Doubts"). All these statements are answered on a 5-point Likert scale (1—"Very small/Not at all" to 5—"Very large/Very much"). A factor score was calculated for each participant, where a higher score indicates more positive future orientations. The internal consistency of the future orientations questionnaire can be considered as good, both at T1 (α = .87) as well as at T2 (α = .88), in line with previous validation research (Jessor et al., 1996; Liebenberg et al., 2015).

Parental support

The parental support that a participant perceives to receive is measured using four statements (e.g., "At home, I get the emotional support and help that I need") (Zimet et al., 1988). Participants answer on a 7-point Likert scale (1—"Totally disagree" to 7—"Totally agree"), with higher scores indicating more parental support. A factor score was calculated for each participant, where a higher score indicates more parental support. The internal consistency of the parental support measure is good at both time points (α = .92).

Sense of control

A participant's sense of control is measured using 11 statements (Lachman & Weaver, 1998); 7 items regarding sense of mastery (e.g., "I can pretty much do everything that I go for") and 4 items regarding sense of constraint (e.g., "I have little control over what is happening to me"). All items can be answered on a 5-point Likert scale (1 – "Totally disagree" to 5 – "Totally agree"), and all items were coded as such that higher scores indicate a higher sense of control. A factor score was calculated for each participant, where a higher score indicates a stronger sense of control. The internal consistency of the sense of control questionnaire can be considered as acceptable ($\alpha = .63$ at T1; $\alpha = .78$ at T2).

Covid-19 hardships

The extent to which a participant has experienced hardships during the covid-19 crisis was measured using nine statements (e.g., "I am afraid that my family will contract the Corona virus") that are scored on a 5-point Likert scale (1 – "Totally disagree" to 5 – "Totally agree"). This covid-19 hardships questionnaire is cohort-specific, and has been found to have an adequate internal consistency ($\alpha = .71$). For our study, we excluded 7 from an initial 16 items due to theoretical overlap with our measures of future orientations or parental support. The remaining nine items were used to obtain a latent factor score for each participant, where a higher score indicates more covid-19 related hardships. An overview of all covid-19 hardships items can be found on Open Science Framework (OSF; https://osf.io/vxb9y).

Strategy of analysis

First, a number of descriptive statistics (mean item scores, standard deviations, Pearson correlations) were obtained on the pre-covid (T1) variables of SES, positive future orientations, parental support, sense of control, and the peri-covid-19 (T2) variables positive future orientations, parental support, sense of control, and covid-19 hardships (Table 2.1). Second, a comprehensive measurement model was estimated to obtain latent variables for positive future orientations, parental support, and sense of control (T1 and T2), and covid-19 hardships for use in the structural model. Third, a series of univariate latent change score (LCS) models were analyzed separately, for positive future orientations, parental support, and sense of control. An LCS factor estimates change in a latent variable of interest between two time points, and provides information about (1) the average change between T1 and T2 (i.e., intercept of the LCS), (2) the extent to which individuals differ in the change they manifest overtime (i.e., variance of the LCS), and (3) the extent to which change is dependent on scores at T1 (i.e., regression coefficient from

T1 to LCS) (Kievit et al., 2018). To answer our research questions, we used LCS modeling in R (Klopack & Wickrama, 2020; McArdle, 2009). LCS is a specific subtype of longitudinal SEM that combines autoregressive and growth curve modeling (Clark et al., 2018). Regarding our research questions, LCS models are particularly helpful in estimating individual differences in growth at the construct level, with the use of 2 waves of data available to us during covid19 – though more measurement waves are preferred when possible (Kievit et al., 2018). Each participant's resulting LCS on positive future orientations, parental support, and sense of control were saved for use in the structural model. Fourth, a structural equation model was tested which includes the standardized score of SES, latent variables of positive future orientations, parental support, and sense of control at T1; LCS variables of positive future orientations, parental support, and sense of control at T2; and covid-19 hardships at T2 (Figure 2.1). To understand if socioeconomic differences in adolescent's positive future orientations increased during covid-19 compared to before (RQ1), we assessed the significance of the regression coefficients of SES on positive future orientations before covid-19 and of SES on change in positive future orientations during covid-19. To understand if socioeconomic differences in parental support explain changes in positive future orientations (RQ2), we looked at the regression coefficients of SES on parental support at T1, and of SES on change in parental support. To understand if socioeconomic differences in sense of control explain changes in positive future orientations (RQ3), we looked at the regression coefficients of SES on sense of control at T1, of SES on change in sense of control, of sense of control at T1 on change in positive future orientations, and the covariance between change in sense of control and change in positive future orientations. To understand if socioeconomic differences in covid-19 related hardships explain changes in positive future orientations (RQ4), we looked at the regression coefficient of SES on covid-19 hardships, and the covariance between covid-19 hardships and change in positive future orientations. Access to anonymized data and syntax can be obtained through the OSF (https://osf.io/juafk/).

Confirmatory factor analyses

Confirmatory factor analyses for the separate factors were pooled to estimate a single measurement model as this tends to yield more reliable estimates of factor loadings and prevents issues related to multiple testing and inflated Type 1 error rates (false positives) (Anderson & Gerbing, 1988; Kenny, 2016). In our initial measurement model, questionnaire items were loaded on their corresponding latent variables. Items were restrained from cross-loading onto other latent variables, and residual covariances between items were also restrained. After obtaining poor model fit, a number of modification indices (ΔMI > 30) were implemented that made our model fit the data good (CFI = 0.92; TLI = 0.91; RMSEA = 0.03). These MI were primarily residual covariances between items on the same

latent construct across time points; cross-loadings remained constrained. The estimated latent variables for positive future orientations, parental support, and sense of control at both T1 and T2 were saved for later use in our univariate LCS models and in our structural model. For positive future orientations and parental support, residual measurement invariance was achieved between T1 and T2; for sense of control, configural measurement invariance was achieved between T1 and T2. More details on the measurement model can be found in Supporting Information: S1; more details on measurement invariance can be found in Supporting Information: S2 (https://osf.io/juafk/).

Measurement invariance

For future orientations, metric measurement invariance was achieved between T1 and T2 (RMSEA = 0.04; CFI = 0.94; $\Delta\chi^2$ = 14.96, p = .38), but scalar measurement invariance was not achieved (RMSEA = 0.04; CFI = 0.94; $\Delta\chi^2$ = 39.49, p < .001). Similarly, for parental support metric measurement invariance was achieved between T1 and T2 (RMSEA = 0.05; CFI = 0.99; $\Delta\chi^2$ (2) = 1.51, p = .47), but scalar measurement invariance was not achieved (RMSEA = 0.05; CFI = 0.99; $\Delta\chi^2$ (3) = 9.12, p < .05). For sense of control, metric measurement invariance was not achieved between T1 and T2 (RMSEA = 0.08; CFI = 0.65; $\Delta\chi^2$ = 1513.9, p < .001). Hence, adolescents may have interpreted questionnaire items on sense of control differently during covid-19 as compared to before (e.g., because of the lockdown).

Univariate LCS models

We estimated three separate univariate LCS models; for positive future orientations, parental support, and sense of control. The resulting LCS variables were subsequently used in our structural model.

RESULTS

Descriptive statistics

Means and correlations can be found in Table 2.1. SES correlated positively with our measures of positive future orientations, sense of control, and parental support; and negatively with covid-19 hardships. The autocorrelations between T1 and T2 measures of positive future orientations, sense of control, and parental support were among the strongest correlations found.

Structural equation model

We estimated a structural equation model to answer our research questions (Figure 2.1). After implementing a number of MI, our model fit the data good (CFI = 0.99; TLI = 0.99; RMSEA = 0.03). All model output can be found in Table 2.2. As expected (H1.1), SES positively predicts positive future orientations at T1 (β = .17, p < .001). The intercept of the LCS variable for positive future orientations was −0.01 (z = −3.37, p < .01), indicating a decline in positive future orientations from before to during covid-19 in the sample as a whole. However, contrary to our expectations (H1.2), SES did not predict changes in positive future orientations, β = .00, p = .32. As expected (H2.1), SES positively predicted parental support at T1 (β = .07, p < .01). The intercept of the LCS variable of parental support was −0.03 (z = −5.36, p < .001), indicating a decline in parental support from before to during covid-19 in the sample as a whole. SES also positively predicted a change in parental support (β = .04, p <.05), in line with our expectations (H2.2). Furthermore, parental support at T1 negatively predicts change in positive future orientations (β = −.01, p < .001). The change in parental support was positively correlated with change in positive future orientations, r = .001, p < .001. As expected (H3.1), SES positively predicted adolescents' sense of control before covid-19, β = .24, p < .01. The intercept of the LCS variable of sense of control was 0.00 (z = −1.30, p = .19), indicating no change in sense of control from before to during covid-19 in the sample as a whole. Contrary to our expectations (H3.2), SES did not predict change in sense of control during covid-19, β = −.04, p = .16. Furthermore, sense of control at T1 does not predict change in positive future orientations (β = .01, p = .19). However, the change in sense of control was negatively correlated with change in positive future orientations, as expected (r = −.02, p < .001). As expected (H4), SES negatively predicted covid-19 hardships, β = −.18, p < .01. Furthermore, covid-19 hardships were negatively correlated with changes in positive future orientations, r = −.01, p < .001. It must be noted that the majority of our significant regression coefficients are meager in size (βs < .20; Cohen, 1988), and may have a negligible effect in real-life.

Table 2.1 *Pearson's zero-order correlations between variables before (n_{T1} = 1231) and during (n_{T2} = 830) covid-19*

		M	SD	1.	2.	3.	4.	5.	6.	7.	8.
Before covid-19	1. Age	17.2	1.72								
	2. SES	0.53	0.27	-0.11**							
	3. Positive Future Orientations	3.73	0.52	-0.11**	0.17**						
	4. Parental Support	5.84	1.36	-0.11**	0.10**	0.41**					
	5. Sense of Control	3.62	0.42	-0.02	0.10**	0.58**	0.40**				
During covid-19	6. Positive Future Orientations	3.68	0.55	-0.12**	0.13**	0.69**	0.31**	0.42**			
	7. Parental Support	5.64	1.37	-0.06	0.14**	0.37**	0.72**	0.33**	0.41**		
	8. Sense of Control	3.62	0.42	-0.04	0.13**	0.46**	0.33**	0.41**	0.58**	0.40**	

*p < .05; **p < .01; ***p < .001

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Figure 2.1 *Structural model of change in adolescent's positive future orientations. All tested associations are included in the figure, except for the covariates age and gender.*
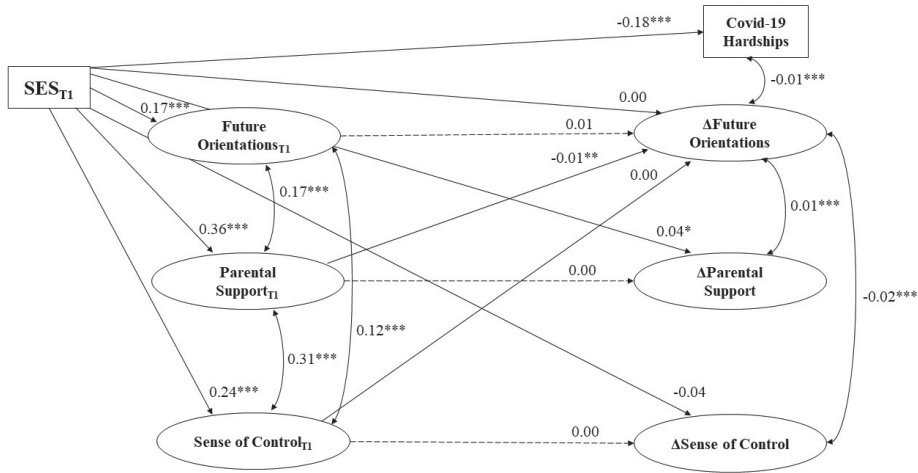
*p <.05; **p <.01; ***p <.001.

Table 2.2 *Regression coefficients and covariances of structural equation model, controlled for age and gender*

	Estimate	SE	z-value	
ΔFuture Orientations ← SES$_{T1}$	0.00	0.01	-0.01	
ΔFuture Orientations ← Sense of Control$_{T1}$	0.00	0.00	0.20	
ΔFuture Orientations ← Parental Support$_{T1}$	-0.01	0.00	-3.12	**
ΔFuture Orientations ← Future Orientations$_{T1}$	0.01	0.01	0.85	
Future Orientations$_{T1}$ ← SES$_{T1}$	0.17	0.03	5.43	***
Sense of Control$_{T1}$ ← SES$_{T1}$	0.24	0.05	5.13	***
Parental Support$_{T1}$ ← SES$_{T1}$	0.38	0.11	3.38	***
ΔSense of Control ← SES$_{T1}$	-0.04	0.03	-1.37	
ΔSense of Control ← Sense of Control$_{T1}$	0.00	0.02	0.08	
ΔParental Support ← SES$_{T1}$	0.04	0.02	2.17	***
ΔParental Support ← Parental Support$_{T1}$	0.00	0.01	-0.17	
Covid-19 Hardships$_{T2}$ ← SES$_{T1}$	-0.18	0.06	-2.78	***
ΔFuture Orientations ←→ ΔSense of Control	-0.02	0.00	-11.92	***
ΔFuture Orientations ←→ ΔParental Support	0.01	0.00	7.31	***
ΔFuture Orientations←→ Covid-19 Hardships$_{T2}$	-0.01	0.00	-4.48	***

* p < .05; ** p < .01; *** p < .001

DISCUSSION

In this study, we investigated if socioeconomic differences in positive future orientations, parental support, and sense of control before covid-19 increased during covid-19. As expected, adolescents from a lower SES background reported less positive future orientations, less parental support, and a weaker sense of control before covid-19. Contrary to expectations, socioeconomic differences in positive future orientations and sense of control did not increase during covid-19. Moreover, adolescents from a higher SES background reported a stronger decline in parental support during covid-19 than adolescents from a lower SES background. Adolescents who reported more parental support before covid-19 reported a smaller decline in positive future orientations, but having a stronger sense of control before covid-19 did not affect change in positive future orientations during covid-19. During covid-19, adolescents who reported a stronger decline in parental support and sense of control also reported a stronger decline in future orientations. Furthermore, adolescents from a lower SES background reported more covid-19 related hardships, but adolescents who reported more hardships also reported a smaller decline in positive future orientations. Overall, socioeconomic differences in future orientations did not increase from before to during covid-19. Our findings have several theoretical and practical implications.

Theoretical implications

Despite a similar decline in positive future orientations, it could be argued that the positive future orientations from adolescents from a lower SES background are more resilient than the positive future orientations of adolescents from a higher SES background (Ellis et al., 2017; Frankenhuis & de Weerth, 2013). Adolescents from a lower SES background experienced less parental support and a weaker sense of control before covid-19, as well as more covid-19-related hardships than adolescents from a higher SES background, yet despite these considerable disadvantages showed a similar decline in positive future orientations as adolescents from a higher SES background. Potentially, exposure to instability and unpredictability before covid-19 gives adolescents from a lower SES background an adaptive advantage during covid-19. For adolescents from a higher SES background, the sudden drop in parental support, and other relatively heightened levels of instability and unpredictability as a result of covid-19, maybe a novel challenge. This finding would be in line with how the development of stress reactivity in childhood environments is understood (Boyce & Ellis, 2005; Del Giudice et al., 2011): adolescents who grow up in a more protected environment (e.g., high SES) experience a similar stress reaction to adversity as adolescents from an unpredictable, perhaps dangerous environment (e.g., low SES), despite being less at risk objectively. If the decline in positive

future orientations among adolescents from a higher SES background is indeed partly an overreaction, future research might find that the positive future orientations of these adolescents recover back to precovid-19 levels faster than the positive future orientations of adolescents from a lower SES background.

Alternatively, the decline in positive future orientations among adolescents from a high-SES background may be the result of unmeasured factors, such as the cancellation of more co-curricular or extracurricular activities, or a regression to the mean considering the relatively high positive future orientations before covid-19. It must also be noted that though the decline in positive future orientations is similar for adolescents from a higher and a lower SES background, its real-life consequences may be more problematic among adolescents from a lower SES background (e.g., from positive to negative future orientations) than among adolescents from a higher SES background (e.g., from very positive to positive future orientations).

Our finding that adolescents who reported more covid-19 hardships also reported a smaller decline in positive future orientations was contrary to our expectations, but may be interpreted in light of adolescent's time-perspective in times of crisis (Fieulaine & Apostolidis, 2015). Adolescents who experienced many hardships during the covid-19 pandemic may shift toward a more present-oriented, threat-focused psychological outlook—also known as contextualism (Kraus et al., 2012) with less capacity to worry about future orientations (see also Guthrie et al., 2009). In contrast, adolescents who had a relatively trouble-free lockdown may have had more idle time to worry excessively about their future. Alternatively, adolescents who experience many covid-19 related hardships may cope with the current situation by actively developing positive future orientations ("things will get better"). Hence, the smaller decline in positive future orientations among adolescents who experience many covid-19 related hardships may merely be a relative comparison to their present situation.

Limitations

A number of factors may limit the reliability and validity of our research findings. First, the covid-19 pandemic has resulted in a relatively large attrition over time. Though adolescents that dropped-out after the first wave scored similarly on future orientations, parental support, and sense of control as adolescents that participated in both waves, we did find that adolescents from a lower SES background were more likely to drop-out. Considering our theoretical assumptions, it could be expected that these adolescents experienced a strong decline in positive future orientations, parental support and sense of control during covid-19 – perhaps even contributing to their drop-out (Fakkel et al., 2020). If drop-outs could have been retained, we might find that adolescents from a lower

SES background experienced a stronger decline in future orientations than adolescents from a higher SES background – more in line with our expectations.

Second, it must be pointed out that our significant findings have small regression coefficients (βs < .20; Cohen, 1988). This suggests that real-life differences between adolescents from a higher or a lower SES background may be negligible. However, considering the large number of variables that have been controlled for in our models, and considering the standardization of all variables, these results are expected to be robust. The large between-person variation in terms of positive future orientations, parental support, and sense of control still indicates a need to be careful with making assumptions about individual adolescents, despite the associations that we have found.

Third, measuring SES in adolescents remains a challenge. Traditional indicators such as parental educational attainment and family income tend to be poorly estimated by adolescents. As such, the FAS is a helpful tool to circumvent this lack of knowledge in participants (Currie et al., 1997; Torsheim et al., 2016). However, considering that the Netherlands has relatively low socioeconomic inequality and relatively high living standards for lower socioeconomic classes, the discriminatory power of certain FAS-items is limited. For example, basically all adolescents reported having a washing machine in their home. On the other hand, measures of household characteristics as an indicator of SES may be particularly relevant during times of lockdown compared to traditional measures of SES. A more elaborate measure of SES could potentially improve the validity of our findings. However, given the rigid validation of the FAS and the socioeconomic differences that our research has revealed, the FAS could be considered an adequate measure of SES (Hobza et al., 2017).

CONCLUSION

Overall, the socioeconomic difference in positive future orientations from before covid-19 did not increase during covid-19 among adolescents. Adolescents who reported a stronger decline in parental support during covid-19 also reported a stronger decline in positive future orientations. In contrast, adolescents who reported more parental support before covid-19, an increase in sense of control during covid-19, or more covid-19-related hardships reported a smaller decline in positive future orientations during covid-19. In the aftermath of covid-19, assistance should be provided to any adolescent who reports a considerable decline in future orientations or parental support, regardless of their SES background. However, as the covid-19 pandemic starts to have less impact on adolescents, positive future orientations and parental support may (naturally) recover to pre-covid levels. In a post-covid-19 era, adolescents from a lower SES background

could be facilitated to hold more positive future orientations. Future orientations may for example be improved by actively planning for the nearby future (Nurmi, 1991), such as through career counseling (e.g., at school), but also depends on characteristics of the larger society, including job security, housing opportunities, and living wages (Sharp et al., 2020). More structural post-covid-19 measures may be necessary to improve the social support system and sense of control of adolescents from a lower SES background, up to the level of adolescents from a higher SES background. At the same time, adolescents from a higher SES background may learn from adolescents from a lower SES background how to minimize a decline in positive future orientations in the face of adversity.

ACKNOWLEDGMENTS

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

2

CHAPTER 3

PARENT-ADOLESCENT TRANSMISSION OF SOCIOECONOMIC STATUS:

TESTING SERIAL MEDIATION OF CONFLICT BEHAVIORS, EMOTION REGULATION, AND EMPATHY

ABSTRACT

In this study, we investigated whether the intergenerational transmission of SES is mediated by parental and adolescents' conflict behaviors, emotion regulation, and empathy. Longitudinal serial mediation analyses were performed on a subset of adolescents (M_{age} = 13.03) and their parents from the RADAR cohort study (N = 320, 52.2% boys) in the Netherlands. Results showed partial support for intergenerational transmission of SES, mostly between mothers and girls. However, no mediation effect was found, primarily because parental SES was mostly unrelated to parental conflict behaviors. Parental conflict behaviors did affect adolescent conflict behaviors, emotion regulation, and empathy, which in turn were associated with SES outcomes in young adulthood. This study nuances the proposition of the *family stress model* that parents from a lower SES background – as a result of economic stress – display less constructive and more destructive conflict behaviors.

Keywords: intergenerational transmission, socioeconomic status (SES), conflict behaviors, empathy, emotion regulation

INTRODUCTION

Adolescents are likely to achieve a similar socioeconomic status (SES) in adulthood as their parents. For example, adolescents who complete a higher level of education generally have higher educated parents (Hertz et al., 2008), and adolescents who receive a higher income tend to have parents with a higher income (Link-Gelles et al., 2016). The intergenerational transmission of SES is commonly studied from a sociological perspective (e.g., Burger, 2016), however, less is known about how family dynamics in the household, such as conflict resolution, may contribute to adolescents ending up with a similar SES as their parents (Heckman & Mosso, 2014).

Differences in how parents resolve conflicts within the nuclear family may over time contribute to the transmission of SES. Such a socialization process as mediating mechanism of SES transmission would be in line with the interactionist perspective (Conger & Donnellan, 2007). According to the interactionist perspective, structural factors such as parental SES positively affect the development of adolescents' psychosocial competencies (i.e., social causation), and adolescent psychosocial competencies positively affect young adulthood SES outcomes (i.e., social selection). Though several studies have assessed (parts of) the interactionist perspective (Martin et al., 2010), little is known about the potential role of specific family dynamics, such as conflict resolution, in SES transmission.

Socioeconomic Differences in Parental Conflict Behaviors

Conflicts in families become increasingly prevalent as children become adolescents (Laursen, 1998). The discrepancy between adolescents' desire for more independence and autonomy and the reservedness of parents to grant that provides ground for conflicts (Laird et al., 2003). During conflicts within the family, constructive and destructive behaviors may be displayed (McCoy et al., 2013; Van Lissa et al., 2016). Constructive conflict behaviors include for example being supportive and taking the other person's perspective, and are generally aimed to solve a problem. Destructive conflict behaviors include for example emotional outbursts and saying things that are regretted later, and generally result in further conflict engagement (Kurdek, 1994).

Parents from a lower SES background experience more economic stress than parents from a higher SES background (*family stress model*; Conger et al., 1994), potentially provoking more destructive conflict behaviors, which adolescents tend to imitate (Granic & Patterson, 2006). Draining economic hardships and financial stress may also make parents less emotionally available and less sensitive to the needs of their adolescents. Previous studies suggest that parents with a lower SES background display less constructive conflict behavior, such as being supportive, and more destructive

conflict behaviors, such as hostility, compared to parents from a higher SES background (Hosokawa & Katsura, 2017).

Adolescents of parents who display less constructive and more destructive conflict behaviors towards each other tend to display less constructive and more destructive conflict behaviors towards their parents (Van Doorn et al., 2007). Hence, it could be argued that adolescents from a lower SES background may be at a higher risk of developing more destructive and less constructive conflict behaviors than adolescents from a higher SES background.

Parental Conflict Behaviors shape Adolescent Emotion Regulation and Empathy

Besides shaping adolescents' conflict behaviors, parental conflict behaviors also impact the broader psychosocial development of adolescents, such as emotion regulation or empathy (Cummings & Davies, 2002; Van Lissa et al., 2017). Family conflicts are explicit, commonplace situations which provide opportunities to practice and refine broader psychosocial competencies (Steinberg & Silk, 2002), such as empathy – the ability to share and understand others' thoughts and feelings (Hoffman, 2001) – and emotion regulation – managing emotional arousal to promote adaptive behavior (Morris et al., 2007). In families with higher levels of destructive conflict behaviors, adolescents are more vulnerable to developing psychological and behavioral problems (Kader & Roman, 2018; Tucker et al., 2003). In contrast, higher levels of constructive conflict behaviors in the family help adolescents develop problem solving skills and effective communication (McCoy et al., 2013). Hence, families in which parents and adolescents respectfully explore differences in interests during family conflicts, patiently listen, and accept emotional reactions during conflicts provide circumstance that are likely to facilitate the broader development of adolescent empathy and emotion regulation (Stocker et al., 2007).

Adolescent Emotion Regulation and Empathy

Several psychosocial competencies – related to adolescents' conflict behaviors, emotion regulation and empathy – have been found to contribute to intergenerational SES transmission (Deming & Kahn, 2018). For example, adolescents of parents with a higher SES background are reported to have higher levels of emotional stability (Schofield et al., 2011), personal efficacy (Groves, 2005), and the capacity to delay gratification (Webley & Nyhus, 2006), all in turn contributing to better SES outcomes. Furthermore, more socially competent adolescents have been found to attain a higher level of education (Stepp et al., 2011), are more likely to be employed as adults (Clausen & Jones, 1998), and have a higher income (Martin et al., 2010). Similarly, adolescents with more self-control tend to have

more academic success (Razza & Raymond, 2013) and are more likely to find and keep a job (Daly et al., 2015). Hence, the intergenerational transmission of SES is potentially mediated by the effect of parental conflict behaviors on adolescent psychosocial competencies, such as empathy and emotion regulation, though comprehensive longitudinal research is scarce.

Gender Differences in Conflict Behavior

Which conflict behaviors are transmitted within the family may differ between genders. For example, gender role expectations elicit more compromising behavior in women and more competitive behavior in men during conflicts (Brahnam et al., 2005). However, while women are typically more caring and considerate towards others than men during conflicts, men are more likely than women to reconcile after a conflict (Benenson & Wrangham, 2016). As adolescents mature, both their understanding of such gender-role expectations as well as socialization pressures increase (Hill & Lynch, 1983; Van der Graaff et al., 2014). Within families, girls express more negativity towards parents than boys, but also withdraw from conflicts with parents more than boys (Branje et al., 2009, 2013). Possibly, girls express more emotional variability than boys during conflicts with parents (Branje, 2018), with higher levels (and stronger transmission) of both constructive as well as destructive conflict behaviors.

Furthermore, adolescents have a more intense relationship with their mother than their father in terms of receiving support and sharing activities, but also in terms of conflicts and expressed negativity (Branje et al., 2013; De Goede et al., 2009). If the majority of conflicts between parents and adolescents are resolved by the mother, it could be expected that mothers' conflict behaviors have more impact on adolescents' conflict behaviors than fathers' conflict behaviors (Chung et al., 2009). However, other studies find no gender differences in conflict behaviors (Mastrotheodoros et al., 2019; Staats et al., 2018), suggesting that conflict behaviors are transmitted similarly between mothers and fathers, and adolescent girls and boys.

Present Study

In this study, we investigated if the intergenerational transmission of SES is mediated by the intergenerational transmission of conflict behaviors, emotion regulation, and empathy. To answer this research question, we focused on five subquestions: RQ1) Does parental SES affect parents' constructive and destructive conflict behaviors?; RQ2) Do parents' constructive and destructive conflict behaviors affect adolescent's constructive and destructive conflict behaviors, emotion regulation, and empathy?; RQ3) Do adolescent's constructive and destructive conflict behaviors, emotion regulation, and

empathy affect SES outcomes in young adulthood?; RQ4) Is the effect of parental SES on young adulthood SES mediated by the effect of parental constructive and destructive conflict behaviors on adolescent constructive and destructive conflict behaviors, emotion regulation, and empathy?; RQ5) Are there gender differences in the intergenerational transmissions of SES and of conflict behaviors?

We hypothesize H1) that parents with a higher SES display more constructive and less destructive conflict behaviors; H2) that parents' constructive conflict behaviors positively affect adolescents' constructive conflict behaviors, emotion regulation, and empathy; and parents' destructive conflict behaviors positively affect adolescents' destructive conflict behaviors, but negatively affect adolescents' emotion regulation and empathy; H3) that adolescents' constructive conflict behaviors, emotion regulation, and empathy positively predict SES outcomes in young adulthood, and adolescents' destructive conflict behaviors negatively predict SES outcomes in young adulthood; H4) that the effect of parental SES on young adulthood SES is mediated by the effect of parental conflict behaviors on adolescent conflict behaviors, emotion regulation, and empathy (i.e., serial mediation); and H5) that the transmission of SES and conflict behaviors is more prominent for mothers (than fathers) and for girls (than boys).

METHOD

Participants and Procedure

Data from the ongoing longitudinal RADAR study was used (Branje & Meeus, 2018). At baseline, 497 adolescents from secondary schools across the province of Utrecht and four main cities in the Netherlands were enrolled as focal participants (56.7% boys; M_{age} = 13.03, SD = 0.46). A total of 1081 families were contacted, of which 470 refused and 114 did not provide informed consent. Six annual measurement waves were conducted from 2006 to 2012, during which data was also collected from mothers, father, siblings, and best friend. From the seventh wave onwards, measurements were collected biannually, primarily from focal participants and their partners.

For participants to be part of the final sample, data on parental SES (T1) and data on young adulthood educational attainment and income (T10) had to be available. At T1, parental SES was reported for 436 participants. At T10, 365 participants were still enrolled, of which 321 participants had indicated their highest level of educational attainment. One participant provided data on their educational attainment in young adulthood, but neither parent's SES was reported, and was therefore excluded from all analyses. The final sample consisted of 320 participants (M_{age} = 25.7 years old; SD = 0.44; 52.2% male). Contrasting the baseline sample (N = 497) to the final sample (N = 320),

attrition analyses showed that participants who dropped out – or did not provide data on measures relevant to this study – were more often boys ($\chi^2(1) = 8.28$, $p < 0.01$) who were relatively older (t (495) = 5.20, $p <$ .001), with relatively lower educated mothers (t (432) = 5.96, $p <$ .001) and fathers (t (387) = 4.05, $p <$ .001). Furthermore, adolescents who dropped out self-reported having less constructive conflict behaviors than those who were retained in the study (t (394) = 2.57, $p <$ .01), but no other attrition biases were observed in our mediators.

MEASURES

Parental SES

Parental SES was assessed at baseline (T1) with both mother's and father's highest level of completed education. Educational attainment was measured on a 6-point scale, reflecting the following ordinal categories: (1) primary school or less, (2) lower secondary school, (3) higher secondary school, (4) vocational education, (5) higher vocational education, and (6) university. Parental SES was calculated as the mean score of father's educational attainment and mother's educational attainment. Parental SES, mother's educational attainment, and father's educational attainment all ranged from 2 to 6. For 19 participants (5.9%), educational attainment of either one of the parents was missing: in these cases, the educational attainment of the other parent was used as singular measure of parental SES.

Educational attainment

Educational attainment at age 26 (T10) was assessed on a 6-point scale, reflecting the ordinal categories of (1) primary school or less, (2) lower secondary school, (3) higher secondary school, (4) vocational education, (5) higher vocational education, and (6) university. Educational attainment ranged from 1 to 6.

Income

Income at age 26 (T10) was measured on a scale from 1 (<€300 net per month) to 11 (>€3.000), with incremental steps of €300.

Constructive conflict behaviors

Constructive conflict behaviors were self-reported by mothers and fathers at T1 and by adolescents at T2, using the Problem Solving subscale (5 items; e.g., "Negotiating and compromising"; '1 – never' to '5 – always') of the Conflict Resolution Style Questionnaire

(CRSQ; Kurdek, 1994). Mothers reported on their conflict behaviors towards father and adolescent, fathers towards mother and adolescent, and adolescent towards mother and father. Constructive conflict behaviors of mothers ranged from 2.30 to 5.00, of fathers from 2.20 to 5.00, of girls from 1 to 4.50, and of boys from 1 to 5. Reliability of constructive conflict behaviors was good for all raters (ranging from α = 0.77 to α = 0.86). Items were used to estimate separate latent factors of constructive conflict behaviors for mothers, fathers, and adolescents, and separate latent factors of destructive conflict behaviors for mothers, fathers, and adolescents. A higher score indicates more constructive behaviors during conflicts.

Destructive conflict behaviors

Destructive conflict behaviors were self-reported by mothers and fathers at T1 and by adolescents at T2, using the Conflict Engagement subscale (5 items; e.g., "Personally attack him/her"; '1 – never' to '5 – always') of the Conflict Resolution Style Questionnaire (CRSQ; Kurdek, 1994). Destructive conflict behaviors of mothers ranged from 1 to 3.60, of fathers from 1 to 3.40, of girls from 1 to 3.80, and of boys from 1 to 3.40. The reliability of destructive conflict behaviors was good for all raters (ranging from α = 0.72 to α = 0.85), and was estimated similarly as constructive conflict behaviors.

Emotion Regulation

Adolescents' emotion regulation was measured at age 14 (T2) with the Impulse Control Difficulties subscale (5 items; e.g., "When I'm upset, I become out of control") and the Difficulties Engaging in Goal-directed Behavior subscale (4 items; e.g., "When I'm upset, I have difficulty focusing on other things"), both from the Difficulties in Emotion Regulation Scale(DERS; Gratz & Roemer, 2004). Adolescents rated themselves on a scale from '1 – almost never' to '5 – almost always'. The DERS has an adequate external validity among adolescents (Neumann et al., 2010). The reliability of the two subscales combined was good (α = 0.80), with mean item scores ranging from 1 to 4.22 for girls and from 1 to 4.78 for boys. The 9 items of the two subscales were used to estimate a single latent factor of emotion regulation, with a higher score indicating that the adolescent is better at regulating emotions.

Empathy

Adolescents' empathy was measured at age 14 (T2) with the Empathic Concern subscale (7 items; e.g., "I am often quite touched by things that I see happen") and the Perspective Taking subscale (7 items; e.g., "Before criticizing somebody, I try to imagine how I would feel if I were in their place"), both from the Interpersonal Reactivity Index (IRI; Davis, 1983;

Sam et al., 1994). Adolescents rated themselves on a scale from '0 – does not describe me well' to '4 – describes me very well', with a higher score indicating that an adolescent is more empathic. The external validity of the IRI was previously found to be adequate among adolescents (Hawk et al., 2013). The reliability of the two subscales combined was good ($\alpha = 0.78$), with mean item scores ranging from 1.57 to 3.64 for girls and from 0.79 to 3.36 for boys. The 14 items of the two subscales were used to estimate a single latent factor of empathy, with a higher score indicating that the adolescent has more empathy.

Strategy of analysis

Research questions, hypotheses, and main analysis were pre-registered at the Open Science Framework: osf.io/9356c . All further materials for this study (including extensive model output, codebook, anonymized data and analysis syntax) are available at the same repository: osf.io/g23yj. First, latent factors of parental constructive conflict behaviors, parental destructive conflict behaviors, adolescent constructive conflict behaviors, adolescent destructive conflict behaviors, adolescent emotion regulation, and adolescent empathy were estimated in a measurement model. Manifest variables were loaded onto their corresponding latent factor, and constrained from cross-loading onto other latent factors. Residual covariances between manifest variables were also initially constrained, but unconstrained if modification indices suggest significant improvements in model fit. Some minor deviations from our pre-registration were made to ensure appropriate factor loadings and model fit.

Next, we estimated two separate structural models – for constructive conflict behavior (Model 1; Figure 3.1) and for destructive conflict behavior (Model 2; Figure 3.2) in order to answer our research questions. The models were identical in structure, except for the type of parental and adolescent conflict behavior. To understand if parental SES positively affects parents' constructive conflict behaviors (RQ1), we assessed the significance of the regression coefficient from parental SES to mothers' conflict behaviors and fathers' conflict behaviors in Model 1 and Model 2. To understand if parents' conflict behaviors positively affect adolescents' constructive conflict behaviors, emotion regulation, and empathy (RQ2), we assessed the significance of the respective regression coefficients in Model 1 and Model 2. And to understand if adolescent constructive conflict behavior (Model 1), destructive conflict behavior (Model 2), emotion regulation and empathy (both models) affect SES outcomes (RQ3), we assessed the significance of the respective regression coefficients.

Next, we investigated if the intergenerational transmission of conflict behaviors mediates the intergenerational transmission of SES (RQ4). We performed a number of serial mediation analyses along significant pathways. The mediating variables were not corrected for prior measures, as we aimed to investigate sequential associations across

developmental timespans and not behavioral changes (as for example intended by Neppl and colleagues (2016)).

We also tested for gender differences (RQ5) in both Model 1 and Model 2 (see Tables 3.3 – 3.6). Conflict behaviors of mothers and fathers were included in our models as separate variables. Potential gender differences between boys and girls in associations between conflict behaviors, empathy, emotion regulation, educational attainment and income were tested by constraining regression pathways step-by-step and assessing model fit improvements.

RESULTS

Preliminary Analyses

Descriptive statistics and baseline gender comparisons can be found in Table 3.1. Correlations between variables of interest can be found in Table 3.2. A confirmatory factor analysis was performed to assess measurement model fit of the proposed factor structure (see Strategy of analysis). Modification indices suggested to unconstrain several residual covariances between manifest variables. After implementation of modification indices (ΔMI > 10.83) our model fit was reasonably good; CFI = 0.90, TLI = 0.90, RMSEA = 0.03 (Shi et al., 2019). Structural model fit indices suggest good fit of the destructive conflict behaviors model to the data (CFI = .98; TLI = 0.93; RMSEA = 0.02), and decent fit of the constructive conflict behaviors model (RMSEA = 0.07; CFI/TLI < 0.84, suggesting a relatively well-fitting baseline model and relatively low correlations among model variables (West et al., 2012)).

RQ1: Parental SES and Parents' Conflict Behaviors

Parental SES was positively related with mothers' constructive conflict behaviors (β = 0.10, p < .05), but not with fathers' constructive conflict behaviors, nor with mothers' and fathers' destructive conflict behaviors. Hence, contrary to our expectations (H1), parental SES is mostly not associated with parental conflict behaviors.

RQ2: Parental Conflict Behaviors and Adolescent Conflict Behaviors

In line with expectations (H2), mothers' constructive conflict behaviors were positively related to adolescents' constructive conflict behaviors at age 14 (β = 0.42, p < .001). Mothers who display more constructive conflict behaviors have adolescents who display more constructive conflict behaviors. Similarly, mothers' destructive conflict behaviors were also

positively related to adolescents' destructive conflict behaviors at age 14, but more so for girls ($\beta = 0.32$, $p < .01$) than for boys ($\beta = 0.20$, $p < .05$). Mothers who display more destructive conflict behaviors have adolescents who display more destructive conflict behaviors. Contrary to expectations (H2), fathers' constructive and destructive conflict behaviors were not related with adolescents' constructive and destructive conflict behaviors.

Table 3.1 *Mean scores (SD) on variables of interest, including gender comparisons*

	Parents	**Mothers**	**Fathers**	*t*-**value**
Parental SES	4.27 (1.23)	4.12 (1.42)	4.45 (1.43)	-3.51**
Constructive Conflict Behaviors	3.80 (0.36)	3.88 (0.45)	3.72 (0.49)	4.54***
Destructive Conflict Behaviors	1.79 (0.37)	1.89 (0.52)	1.68 (0.46)	5.71***
	Adolescents	**Girls**	**Boys**	
Educational Attainment	4.35 (1.50)	4.45 (1.36)	4.26 (1.61)	-1.12
Income	5.82 (2.62)	5.61 (2.32)	6.02 (2.86)	1.39
Constructive Conflict Behaviors	3.05 (0.78)	2.96 (0.76)	3.13 (0.79)	1.95
Destructive Conflict Behaviors	1.52 (0.57)	1.63 (0.68)	1.42 (0.44)	-3.17**
Empathy	2.31 (0.51)	2.50 (0.50)	2.13 (0.46)	-6.68***
Emotion Regulation	2.89 (0.71)	2.83 (0.72)	2.95 (0.69)	1.00

*$p < .05$; **$p < .01$; ***$p < .001$

RQ2: Parental Conflict Behaviors and Adolescent Emotion Regulation and Empathy

In line with expectations (H2), mothers' constructive conflict behaviors were positively related with adolescents' emotion regulation at age 14 ($\beta = 0.38$, $p < .001$). Mothers who display more constructive conflict behaviors have adolescents who can better regulate their emotions. Partially in line with expectations, mothers' destructive conflict behaviors negatively affected emotion regulation at age 14 of girls ($\beta = -0.35$, $p < .05$), but not of boys. Mothers who displayed more destructive conflict behaviors have girls who were worse at regulating their emotions. Contrary to our expectations, fathers' destructive conflict behaviors positively affected emotion regulation at age 14 of boys ($\beta = 0.28$, $p < .05$), but not of girls. Fathers who displayed more destructive conflict behaviors have boys who better regulated their emotions. Mothers' constructive conflict behaviors were also positively related with girls' empathy at age 14 ($\beta = 0.19$, $p < .05$), but not boys' empathy. Mothers who display more constructive conflict behaviors have girls who are more empathic. In contrast to our expectations, fathers' constructive conflict behaviors did not affect adolescents' emotion regulation nor empathy. Similarly, neither mothers' nor fathers' destructive conflict behaviors were related with adolescents' empathy.

RQ3: Adolescent Conflict Behaviors, Emotion Regulation, and Empathy, and Young Adulthood SES

In contrast to our expectations (H3), adolescent constructive and destructive conflict behaviors at age 14 were mostly unrelated with SES outcomes at age 26, except for the positive association between girls' constructive conflict behaviors and educational attainment ($\beta = 0.26$, $p < .001$). Girls who displayed more constructive conflict behaviors attained a higher level of educational attainment.

As expected (H3), adolescent emotion regulation at age 14 was positively related with educational attainment at age 26 ($\beta = 0.12$, $p < .05$; Figure 1), but more so for girls than for boys ($\beta = 0.21$, $p < .05$; Figure 2). Adolescents who better regulated their emotions attained a higher level of education in young adulthood. We found some evidence that girls with better emotion regulation at age 14 attain a higher income at age 26 ($\beta = 0.14$, $p < .05$), but overall, emotion regulation is mostly not related to income.

Opposite to our expectations (H3), adolescent empathy was negatively related with SES outcomes. Empathy at age 14 was negatively related with educational attainment at age 26 for girls ($\beta = -0.28$, $p < .05$), but not boys when controlled for constructive conflict behaviors. Girls who were less empathic attained a higher level of education. However, when controlling for destructive instead of constructive conflict behaviors, empathy at age 14 was unrelated to educational attainment and income at age 26. Empathy at age 14 was negatively related with income at age 26 ($\beta = -0.29$, $p < .01$), when controlling for constructive conflict behaviors. Adolescents who were less empathic attained a higher income. When controlling for destructive instead of constructive conflict behaviors, empathy at age 14 was only negatively associated with income at age 26 for girls ($\beta = -0.27$, $p < .05$) but not for boys. Girls who were less empathic attained a higher income. Hence, empathy at age 14 was mostly unrelated with educational attainment at age 26, but mostly negatively related with income at age 26.

RQ4: Intergenerational conflict transmission as mediating mechanism of intergenerational SES transmission

Comprehensive serial mediation analyses were performed to assess if the intergenerational transmission of SES was mediated by the intergenerational transmission of parents' conflict behaviors to adolescent's conflict behaviors, emotion regulation, and empathy. Serial mediation indicates that all effects are transmitted by way of an intervening effect, thus requiring significant individual pathways (Agler & De Boeck, 2017). Following this requirement, three serial mediation analyses were performed (Table 3.7): i) from parental SES to mothers' constructive conflict behaviors to girls' constructive conflict behaviors to girls' educational attainment; ii) from parental SES to mothers' constructive conflict behaviors to girls' constructive conflict behaviors to girls' emotion regulation to

girls' educational attainment; and iii) from parental SES to mothers' constructive conflict behaviors to girls' empathy to girls' educational attainment. For all indirect pathways in the serial mediation analyses, we estimated bias-corrected bootstrapped confidence intervals with 1000 samples. None of the serial mediation analyses yielded a significant indirect pathway. Neither did the singular mediation analyses – as part of the serial mediation analyses – yield a significant indirect pathway.

In our destructive conflict model (Figure 3.2), no associations were found between parents' educational attainment and parents' destructive conflict behaviors. Consequently, no serial mediation analyses were performed. From these consistent null findings we conclude that the transmission of educational attainment is not mediated by the transmission of parental conflict behaviors to adolescent conflict behaviors, emotion regulation, and empathy.

3

Table 3.2 *Correlations between variables of interest split out by adolescents' gender; for girls above the diagonal and for boys below the diagonal*

Girls Boys	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Parental SES		0.31***	0.10	0.18*	0.05	0.14	-0.11	0.03	-0.12	0.16	0.09
2. Educational Attainment	0.11		0.28***	0.08	-0.06	0.23**	-0.09	0.01	-0.15	-0.05	0.24**
3. Income	-0.10	0.31***		0.11	0.04	0.10	-0.13	-0.16*	-0.14	-0.16	0.19
4. Mother Constructive Conflict	-0.05	-0.15*	0.04		0.19*	0.30***	-0.33***	-0.10	-0.13	0.19*	0.21**
5. Father Constructive Conflict	0.09	0.01	-0.03	0.26***		0.12	-0.17*	-0.46***	-0.11	0.02	0.02
6. Adolescent Constructive Conflict	0.06	0.02	-0.01	0.26***	0.06		-0.19*	-0.16*	-0.24**	0.38***	0.06
7. Mother Destructive Conflict	-0.01	0.06	-0.06	-0.37***	-0.12	-0.06		0.13	0.29***	0.08	-0.24**
8. Father Destructive Conflict	-0.05	-0.01	-0.06	-0.08	-0.42***	0.00	0.13		0.17*	0.11	-0.01
9. Adolescent Destructive Conflict	-0.08	0.02	0.17*	-0.11	-0.11	-0.22**	0.21**	0.06		-0.08	-0.69***
10. Adolescent Empathy	0.01	0.07	-0.08	-0.05	-0.07	0.42***	0.05	0.08	-0.03		-0.04
11. Adolescent Emotion Regulation	0.01	0.01	-0.10	0.20**	-0.04	0.20**	-0.15*	0.14	-0.58***	-0.08	

*$p < .05$; **$p < .01$; ***$p < .001$
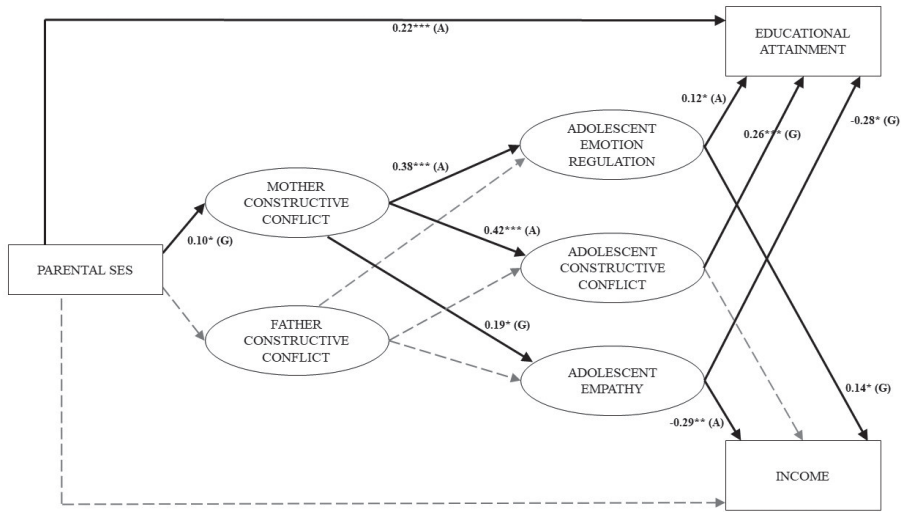
Figure 3.1 *Constructive Conflict model. All regression coefficients of the Constructive Conflict model can be found in Table 3.3*
N.B. (A) = significant for all adolescents with no gender differences; (G) = significant for girls only; (B) = significant for boys only. Dashed lines indicate non-significant associations.
*p < .05; **p < .01; ***p < .001
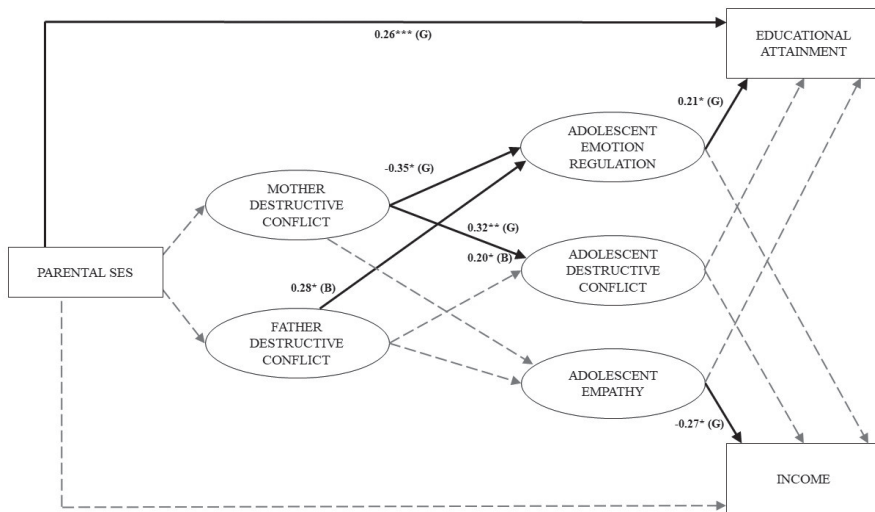
Figure 3.2 *Destructive Conflict model. All regression coefficients of the Destructive Conflict model can be found in Table 3.4*
N.B. (A) = significant for all adolescents with no gender differences; (G) = significant for girls only; (B) = significant for boys only; dashed line = non-significant regardless of adolescent gender.
*p < .05; **p < .01; ***p < .001

Table 3.3 *Regression coefficients (and standard errors) of associations in Constructive Conflict model for total sample, for boys, and for girls.*

	Total	Girls	Boys
Parental SES -> Educational Attainment	0.180** (0.05)	0.247*** (0.06)	0.132 (0.09)
Parental SES -> Income	0.006 (0.06)	0.087 (0.07)	-0.120 (0.09)
Parental SES -> Mother Constructive Conflict	0.050 (0.03)	0.097* (0.04)	-0.032 (0.05)
Parental SES -> Father Constructive Conflict	0.034 (0.03)	0.022 (0.03)	0.048 (0.04)
Mother Constructive Conflict -> Constructive Conflict	0.434*** (0.08)	0.420*** (0.11)	0.421*** (0.11)
Mother Constructive Conflict -> Emotion Regulation	0.394*** (0.10)	0.377* (0.16)	0.389** (0.12)
Mother Constructive Conflict -> Empathy	0.034 (0.06)	0.191* (0.09)	-0.032 (0.07)
Father Constructive Conflict -> Constructive Conflict	0.043 (0.10)	0.131 (0.16)	-0.019 (0.13)
Father Constructive Conflict -> Emotion Regulation	-0.133 (0.12)	-0.055 (0.22)	-0.190 (0.12)
Father Constructive Conflict -> Empathy	-0.056 (0.08)	-0.026 (0.11)	-0.071 (0.10)
Constructive Conflict -> Educational Attainment	0.075 (0.06)	0.260*** (0.08)	-0.028 (0.10)
Constructive Conflict -> Income	-0.070 (0.06)	0.167 (0.09)	0.077 (0.11)
Emotion Regulation -> Educational Attainment	0.090 (0.06)	0.168** (0.06)	0.027 (0.09)
Emotion Regulation -> Income	-0.078 (0.06)	0.135* (0.06)	-0.132 (0.08)
Empathy -> Educational Attainment	0.029 (0.08)	-0.282* (0.12)	0.155 (0.13)
Empathy -> Income	0.006 (0.06)	-0.353** (0.11)	-0.221 (0.15)

*$p < .05$; **$p < .01$; ***$p < .001$

Table 3.4 *Regression coefficients (and standard errors) of associations in Destructive Conflict model for total sample, for boys, and for girls*

	Total	Girls	Boys
Parental SES -> Educational Attainment	0.190*** (0.05)	0.264*** (0.06)	0.136 (0.09)
Parental SES -> Income	0.005 (0.06)	0.096 (0.07)	-0.103 (0.09)
Parental SES -> Mother Destructive Conflict	-0.058 (0.04)	-0.072 (0.06)	-0.008 (0.06)
Parental SES -> Father Destructive Conflict	-0.006 (0.03)	0.016 (0.05)	-0.031 (0.05)
Mother Destructive Conflict -> Destructive Conflict	0.290*** (0.07)	0.323** (0.11)	0.203* (0.09)
Mother Destructive Conflict -> Emotion Regulation	-0.329** (0.10)	-0.349** (0.13)	-0.278 (0.15)
Mother Destructive Conflict -> Empathy	0.094 (0.05)	0.054 (0.06)	0.041 (0.08)
Father Destructive Conflict -> Destructive Conflict	0.113 (0.06)	0.191 (0.10)	0.031 (0.07)
Father Destructive Conflict -> Emotion Regulation	0.152 (0.08)	0.036 (0.11)	0.278* (0.12)
Father Destructive Conflict -> Empathy	0.084 (0.05)	0.097 (0.06)	0.073 (0.08)
Destructive Conflict -> Educational Attainment	0.078 (0.09)	0.054 (0.10)	0.119 (0.15)
Destructive Conflict -> Income	0.082 (0.16)	-0.045 (0.12)	0.282 (0.16)
Emotion Regulation -> Educational Attainment	0.138 (0.07)	0.213* (0.08)	0.064 (0.11)
Emotion Regulation -> Income	-0.049 (0.08)	0.121 (0.10)	-0.009 (0.11)
Empathy -> Educational Attainment	0.073 (0.08)	-0.128 (0.13)	0.146 (0.12)
Empathy -> Income	-0.024 (0.08)	-0.267* (0.10)	-0.144 (0.13)

$*p < .05; **p < .01; ***p < .001$

3

Table 3.5 *Testing gender differences in pathways of the Constructive Conflict model*

		AIC	BIC	Δχ²
1	**Reference model: Gender fully unconstrained**	5863.4	6127.2	
2	Parental SES -> Educational Attainment	5862.5	6122.5	1.18
3	Parental SES -> Income	5864.7	6124.7	3.48
4	Parental SES -> Mother Constructive Conflict	5865.4	6125.4	4.15*
5	Parental SES -> Father Constructive Conflict	5861.6	6121.6	0.25
6	Mother Constructive Conflict -> Adolescent Constructive Conflict	5861.4	6121.4	0.00
7	Father Constructive Conflict -> Adolescent Constructive Conflict	5861.9	6121.9	0.50
8	Mothers Constructive Conflict -> Emotion Regulation	5861.4	6121.4	0.00
9	Father Constructive Conflict -> Emotion Regulation	5861.7	6121.7	0.29
10	Mothers Constructive Conflict -> Empathy	5865.0	6125.0	4.28*
11	Fathers Constructive Conflict -> Empathy	5861.5	6121.5	0.10
12	Adolescent Constructive Conflict -> Educational Attainment	5865.9	6125.9	5.83*
13	Adolescent Constructive Conflict -> Income	5861.8	6121.8	0.43
14	Emotion Regulation -> Educational Attainment	5863.0	6123.0	1.42
15	Emotion Regulation -> Income	5866.9	6126.9	5.68*
16	Empathy -> Educational Attainment	5866.0	6126.0	6.74**
17	Empathy -> Income	5861.8	6121.8	0.50

*$p < .05$; **$p < .01$; ***$p < .001$

Table 3.6 *Testing gender differences in pathways of the Destructive Conflict model*

		AIC	BIC	Δχ²
1	**Reference model: Gender fully unconstrained**	5859.7	6123.5	
2	Parental SES -> Educational Attainment	6019.4	6279.4	45.13***
3	Parental SES -> Income	6021.1	6281.1	44.80***
4	Parental SES -> Mother Destructive Conflict	6018.8	6278.8	40.87***
5	Parental SES -> Father Destructive Conflict	6018.6	6278.6	42.23***
6	Mother Destructive Conflict -> Adolescent Destructive Conflict	6019.1	6279.1	39.78***
7	Father Destructive Conflict -> Adolescent Destructive Conflict	6019.5	6279.5	46.05***
8	Mothers Destructive Conflict -> Emotion Regulation	6018.3	6278.3	38.73***
9	Father Destructive Conflict -> Emotion Regulation	6019.7	6279.7	46.19***
10	Mothers Destructive Conflict -> Empathy	6018.1	6278.1	42.33***
11	Fathers Destructive Conflict -> Empathy	6018.1	6278.1	44.90***
12	Adolescent Destructive Conflict -> Educational Attainment	6018.2	6278.2	45.49***
13	Adolescent Destructive Conflict -> Income	6020.5	6280.5	44.33***
14	Emotion Regulation -> Educational Attainment	6019.2	6279.2	42.42***
15	Emotion Regulation -> Income	6018.9	6278.9	43.12***
16	Empathy -> Educational Attainment	6020.2	6280.3	45.60***
17	Empathy -> Income	6018.5	6278.5	45.79***

*p < .05; **p < .01; ***p < .001

Table 3.7 *Serial mediation analyses to test if psychosocial transmission from mothers to girls mediates SES transmission*

	Indirect effect	SE	Bootstrapped CI	
	β		Lower	Upper
Parental SES -> Mother Constructive Conflict -> Girls Constructive Conflict -> Educational Attainment	0.01	0.01	0.00	0.02
Parental SES -> Mother Constructive Conflict -> Girls Emotion Regulation -> Educational Attainment	0.01	0.00	0.00	0.01
Parental SES -> Mother Constructive Conflict -> Girls Empathy -> Educational Attainment	-0.01	0.00	-0.01	0.00

*p < .05; **p < .01; ***p < .001

DISCUSSION

The aim of the present study was to examine if the intergenerational transmission of socioeconomic status is mediated by the intergenerational transmission of parental conflict behaviors and adolescent conflict behaviors, emotion regulation, and empathy. Contrary to our expectations, the intergenerational transmission of SES was not mediated by the intergenerational transmission of conflict behaviors, emotion regulation, or empathy. More specifically, parents' SES was mostly unrelated to parents' conflict behaviors. Parents' conflict behaviors were mostly positively associated with adolescents' conflict behaviors, emotion regulation and empathy, though considerable gender differences were observed.

Both intergenerational transmission of SES and of conflict behaviors was stronger for mothers and girls than for fathers and boys. Adolescent emotion regulation was mostly positively related with young adulthood SES outcomes, and adolescent empathy was mostly negatively related with young adulthood SES outcomes. Adolescent constructive and destructive conflict behaviors were mostly unrelated with young adulthood SES outcomes. These findings have several theoretical and practical implications.

Our findings offer little to no support for the *family stress model* and the *social causation hypothesis* (Conger & Donnellan, 2007). Previous studies have suggested that parents with a higher educational attainment have more knowledge and resources to display positive parenting behaviors (Bornstein & Bradley, 2003), and specifically, constructive conflict behaviors (Hoff et al., 2002), but we mostly found no differences in conflict behaviors between lower and higher educated parents. Conflict behaviors of parents remained mostly unaffected by economic hardships and financial stress associated with their socioeconomic status, except that mothers with a higher SES displayed more constructive conflict behaviors than mothers with a lower SES. The positive associations between parental SES and mothers' constructive conflict behaviors, and mother's constructive conflict behaviors and adolescent's psychosocial outcomes does support the notions of the *family stress model*, however, effects are small and outnumbered by null associations. In light of these findings, it is important to further identify how parents – and adolescents – from a low SES background manage to resolve conflicts effectively despite stress and strain, and at what potential cost (Chen et al., 2011).

Our findings offer more support for the *social selection hypothesis* (Conger & Donnellan, 2007), indicating that parents' conflict behaviors affect adolescent's conflict behaviors, emotion regulation, and empathy, which in turn are associated with young adulthood SES outcomes. Hence, parents may shape adolescent's emotion regulation and empathy through day-to-day interactions (e.g., conflicts) and these psychosocial competencies (e.g., emotion regulation) select adolescents into a particular educational level and into a job with a particular income in young adulthood. Though these findings

appear to have possible practical implications, it must be noted that the process of intergenerational SES transmission is longitudinal and complex, involving several factors beyond the influence of family interactions (such as genetic predispositions, social policies, or even luck; see for example Mackenbach, 2017). The practical implications of our findings must therefore not be overstated or misinterpreted.

The extent to which SES was transmitted in our sample was smaller than we expected based on previous research. We found a moderate positive association between parental educational attainment and adolescent educational attainment, though several previous studies found a stronger positive association (Hertz et al., 2008). Contrary to our hypotheses, we observed no association between parental educational attainment and adolescents' income: this is likely due to the age at which we measured income (Black & Devereux, 2011). Education-driven income differences start to manifest from age 30 to 40, when individuals with a university education may start to seize better paid (career) opportunities, whereas most vocational educated individuals have then achieved a (relatively lower paid) career ceiling.

Alternatively, the null association between parents' SES and parents' conflict behaviors may be the result of a sampling bias and survivorship bias yielding a relatively 'high functioning' low SES subsample (Fakkel et al., 2020; Green et al., 2022). Families with a low SES background experience (or perceive) more thresholds to research participation – for example, due to financial stress – which could result in the inclusion and retention of relatively well-functioning low SES families. Similarly, higher levels of destructive conflict behaviors in low (or high) SES families can in itself be a reason for non-participation or attrition. When researching socioeconomic differences in development, it is important to consider how socioeconomically representative the sample is of the population as a whole, but also how representative participants with a low SES background are of their respective low SES population. Attrition analyses suggest no skewed drop-out regarding parental conflict behaviors, or adolescent emotion regulation and empathy, but a higher drop-out among adolescents with less constructive conflict behaviors. Hence, while attrition appears to not result in a particularly high functioning low SES subsample, the initial baseline inclusion may have already done so. In the absence of relevant non-inclusion data this remains somewhat speculative.

It must be noted that the main aim of the RADAR study as a cohort is to investigate family dynamics in two-parent families with Dutch nationality/ethnicity, and as such provides detailed data on conflict behaviors, emotion regulation, and empathy. This study specifically examined effects of variation in SES, not necessarily involving families from the lowest part of the SES spectrum. Considering all, it could be argued that reusing high quality secondary data outweighs the burden placed on (more socioeconomically diverse) participants for new longitudinal data collections.

3

Our finding that mothers' – but not fathers' – conflict behaviors were positively related with adolescents' conflict behaviors is in line with previous research that suggests a predominant role of mothers and girls in conflict transmission (Branje et al., 2013; De Goede et al., 2009). It has been argued that in the less intense father-adolescent relationship, conflict transmission is lagged (Van Doorn et al., 2011). At a later stage in adolescence, fathers' conflict behaviors could be as impactful on adolescents' conflict behaviors, empathy, and emotion regulation as mothers' conflict behaviors. However, we found that mothers' and fathers' destructive conflict behaviors had gender-specific opposite effects on adolescents' psychosocial development, which seems to indicate that fathers' impact is qualitatively different from mothers' impact.

In partial support of hypotheses, we found that several adolescents' psychosocial competencies were positively related with SES outcomes, particularly for girls. For example, emotion regulation was positively related with educational attainment and income, but more so for girls than boys. Constructive conflict behaviors were positively related with educational attainment for girls but not boys. However, contrary to hypotheses, we also found that some psychosocial competencies were negatively related with SES outcomes, and that these associations differed considerably between boys and girls. For example, the association between empathy and income is negative for both girls and boys. Gender differences were observed in the extremes of this association: the majority of high empathy, low-income adolescents are girls, whereas the majority of low empathy, high income adolescents are boys. Previous research suggests that individuals with higher levels of empathy prefer a people-oriented career over a technology-oriented career, with a corresponding lower and higher income (Pantovic-Stefanovic et al., 2015). Within the same sector, less empathic individuals may negotiate a higher income than more empathic individuals (Amanatullah & Morris, 2010). Gender role expectations may also reinforce lower levels of empathy in boys, whereas lower levels of empathy in girls (for example during negotiations) could result in considerable backlash (Judge et al., 2012). Future research could further disentangle gender differences, direction of causality, or potential confounding variables in the negative association between empathy and income (Piff et al., 2010).

Educational attainment and income were similar for girls and for boys, but the associations between psychosocial competencies and SES outcomes differed considerably between girls and boys. This suggests that SES outcomes are achieved through different processes for girls than for boys. Possibly, the educational and occupational performance of boys is measured primarily by objective standards, whereas the performance of girls is additionally judged by psychosocial (or stereotypical) standards. Future research on SES transmission and social mobility should aim to further identify gender differences in processes relevant for SES attainment (Martin et al., 2010; Schofield et al., 2011), while simultaneously scrutinizing systemic factors upholding such (unfair) gender expectations.

It must be noted, however, that the gender differences we observed may in part be influenced by our sample composition. Despite considerable retention efforts over 10 waves and 15 years of data collection, attrition has been skewed towards boys with lower educated parents. This attrition may obscure our understanding of psychosocial transmission and SES transmission from parents to boys in the population. Possibly, gender differences in psychosocial transmission and SES transmission are smaller or even absent in the population. For example, we found that mothers' destructive conflict behaviors are negatively related with girls' but not boys' emotion regulation, and that fathers' destructive conflict behaviors are positively related with boys' but not girls' emotion regulation. Among boys who dropped out, however, emotion regulation could be negatively affected by mothers' and fathers' destructive conflict behavior (i.e., similar to mothers and girls). In fact, higher levels of destructive conflict behaviors and poorer emotion regulation resemble characteristics of family dysfunction that are known to contribute to research attrition (Kazdin et al., 1993). If these boys had been retained, fathers' destructive conflict behaviors would likely be more similarly (un)associated to boys' and girls' emotion regulation. Future cross-sectional research could attempt to replicate our study in a sample with more participants from a lower SES background and more boys. Future longitudinal research projects should consider oversampling boys from a lower SES background at baseline (Fakkel et al., 2020).

Furthermore, maximum scores on destructive conflict behaviors and minimum scores on constructive conflict behaviors were rare if not almost entirely absent in our sample. Though small differences in conflict behaviors can nonetheless be meaningfully interpreted, most parents with relatively higher scores on destructive conflict behaviors or relatively lower scores on constructive conflict behaviors are still predominantly constructive during conflicts. However, self-reporting one's conflict behaviors may contribute to a more favorable appearance on paper compared to reality (Johnson & Hall, 2018). Future research could incorporate observational measures of conflict behaviors to reduce social desirability bias or recall bias, though other biases may occur instead. Alternatively, previous measures of conflict behavior could be controlled for (in a mediation framework) to understand how changes in conflict behavior are associated with parental SES and young adulthood SES.

3

CONCLUSION

These findings contribute to our understanding of how family dynamics influence SES transmission. Though the intergenerational transmission of conflict behaviors was not found to mediate the intergenerational transmission of SES, family dynamics have a considerable impact on adolescents' SES outcomes. In particular, mothers' constructive and destructive conflict behaviors shape adolescents' conflict behaviors as well as their emotion regulation and empathy. Adolescents' psychosocial competencies mostly have a positive contribution to SES outcomes, however, too much empathy can be counter-effective, particularly for girls' income. In contrast to the proposition of the *family stress model* (R. D. Conger et al., 1994), that parents with a low SES are more likely to engage in parenting practices that interfere with healthy psychosocial development of adolescents, the findings of this study do not reveal such differences in parenting, and more specifically in conflict behavior. Future research should consider other parenting practices than conflict behavior to identify processes in SES transmission between parents and children.

CHAPTER 4

PARENTAL SES AND FAMILY SUPPORT AS PREDICTORS OF EDUCATIONAL LEVEL: TESTING THE BUFFERING EFFECT OF EFFORTFUL CONTROL AND PEER SUPPORT

ABSTRACT

Some adolescents attain a high educational level despite growing up under adverse circumstances. Using data from the Dutch TRAILS cohort study (N = 2,175 adolescents; 50.8% female), we investigated if higher levels of effortful control and peer support can buffer against the negative effects of a lower parental SES and less family support on educational level. Two multinomial logistic regressions were performed (from early to mid-adolescence and from mid-adolescence to young adulthood) with post-hoc tests to contrast four ordinal educational levels: practical vocational, theoretical vocational, higher general, and (pre-)university. Adolescents with a higher parental SES consistently more likely ended up in a higher educational level, but family support was hardly associated with educational level. Neither effortful control or peer support buffered the associations of parental SES and family support with educational level. Effortful control had a positive direct effect on educational level, regardless of parental SES or family support. Overall, our findings indicate that individual characteristics, such as adolescent effortful control and peer support, are unlikely to fully compensate socioeconomic inequalities in educational attainment – for which more structural changes may be required.

Keywords: socioeconomic status (SES), family support, effortful control, peer support, educational attainment

INTRODUCTION

Adolescents whose parents have a higher socioeconomic status (parental SES) generally attain a higher level of education than adolescents whose parents have a lower socioeconomic status (Hertz et al., 2008). According to the *family investment model* (Conger & Donnellan, 2007), parents with a higher SES have more financial resources to invest into the academic development of their adolescent, such as basic school equipment, extracurricular activities, or private tutoring. For example, the annual expenses for additional private tutoring in the Netherlands have risen from approximately €30 million in 1995 to over €200 million in 2016, and are mostly spent by parents with a higher SES (Elffers, 2019). Furthermore, parents with a higher SES generally have a better understanding of the educational system and its requirements which can help adolescents at crucial moments in their educational trajectory, such as during school transitions (Dumont et al., 2019; Lareau & Cox, 2011).

Besides parental SES, the extent to which adolescents receive family support is also positively associated with educational level (Conger & Donnellan, 2007). A supportive family is characterized by positive communication habits, a positive handling of unexpected events, and acceptance and trust towards one another (Miller et al., 2000). Adolescents with more family support tend to have more constructive discussions with their parents, receive more encouragement, and receive help to overcome challenges in school, while also being held accountable for their actions and decisions (Kohl et al., 2000; Suizzo & Stapleton, 2007). Such family support fosters a sense of control, belonging, and security in adolescents (Surjadi et al., 2011). In contrast, adolescents who receive less family support are more likely to feel unmotivated, insecure, and have lower self-efficacy (Bradley et al., 2001; Fan & Williams, 2010). As such, a lower parental SES and less family support may be risk factors for adolescents to attain a lower educational level.

Effortful Control and Peer Support as buffers against low Parental SES and less Family Support

Some adolescents manage to attain a higher educational level despite risk factors in their home environment, such as a lower parental SES or less family support. These resilient adolescents may benefit from having high effortful control and high peer support for their academic development (Beauvais & Oetting, 1999). Effortful control refers to the capacity to deliberately and voluntarily suppress a dominant response and instead perform a subdominant response (Kochanska et al., 2000). Adolescents with more effortful control are better capable to resist temptation, overcome distractions, and work towards long-term goals (Maloney et al., 2012). Peer support refers to the behavioral

confirmation and affection that adolescents receive from classmates and friends, and serves as an important source of social well-being (Ormel et al., 1999).

In a low SES context, effortful control can enable adolescents to down-regulate distracting thoughts and feelings, and focus attention on positive long-term goals (Lengua et al., 2008). Similarly, adolescents with more effortful control may be able to mitigate negative effects of less family support by being flexible when an unexpected event or conflict occurs within the family (Loukas & Roalson, 2006; Thompson et al., 2020). Hence, having more effortful control may prevent adverse circumstances at home to negatively affect adolescents' educational endeavors.

Having more peer support may also be a protective buffer for the educational level of adolescents with a lower parental SES or less family support (Bradley et al., 2021; Winne & Nesbit, 2010). Adolescents with more peer support frequently experience kind words of encouragement, and feel connected and engaged, whereas adolescents with less peer support have fewer such experiences, and may even be subject to bullying (Hombrados-Mendieta et al., 2012; Wentzel et al., 2016). Peer support may boost adolescents' sense of self-efficacy and sense of belonging, thereby serving as a buffer against possible negative effects of a lower parental SES or less family support on educational level (Chen et al., 2017; Malecki & Demaray, 2006; Rodgers & Rose, 2002).

Present Study

In this study, we assessed effortful control and peer support as moderators in the associations of parental SES and family support with educational level (see Figure 4.1). Research questions and hypotheses were preregistered at OSF: osf.io/8z9p7. We first assessed if lower parental SES (RQ1.1) and less family support (RQ1.2) are risk factors for the educational level that adolescents attain. Next, we assessed if the association between parental SES and educational level was mitigated by effortful control (RQ2.1) and peer support (RQ2.2). Similarly, we assessed if the association between family support and educational level was mitigated by effortful control (RQ3.1) and peer support (RQ3.2).

We expected to find that adolescents with a lower parental SES (H1.1) and less family support (H1.2) attain a lower educational level. We also expected that effortful control (H2.1) and peer support (H2.2) buffer against (i.e., mitigate) the effect of parental SES on educational level. Similarly, effortful control (H3.1) and peer support (H3.2) were expected to buffer against the effect of family support on educational level.

All associations of interest were examined in two developmentally different age periods (i.e., early to mid-adolescence and mid-adolescence to young adulthood) coinciding with two different stages of education (i.e., secondary education and tertiary education): from age 11 to age 16 (Model 1) and from age 16 to age 26 (Model 2).
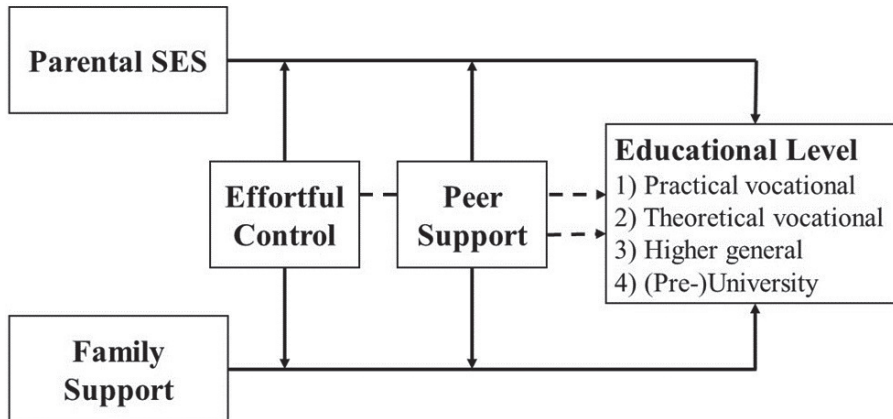
Figure 4.1 *Diagram of tested associations, from early to mid-adolescence (Model 1) and from mid-adolescence to young adulthood (Model 2).*

4

METHOD

Participants and procedure

Data from three waves (T1 – T3 – T6) of the TRacking Adolescents' Individual Lives Survey (TRAILS) were used. TRAILS is a population-based prospective cohort study focused on adolescents and their families from Groningen, the northern region of the Netherlands (Oldehinkel et al., 2015). Eligible adolescents were identified through municipality registers and registers of 122 participating schools (i.e., 90.4% of the schools accommodating 90.3% of eligible children in the selected municipalities). Adolescents and their families were first informed about (the purpose of) the TRAILS study through brochures and school visits, after which telephone calls were made to inquire about participation and answer any remaining questions. This recruitment approach resulted in the inclusion of 2229 out of an eligible 3134 adolescents and their families (71.1%). Written informed consent was obtained from both adolescents and their parents prior to inclusion in the study. Ethical approval for TRAILS was obtained from the Dutch national ethics committee Central Committee on Research Involving Human Subjects (#NL38237.042.11).

Adolescents in the baseline sample (N = 2229; M_{age} = 11.1, SD = 0.55; 50.8% girls) were followed between 2000 and 2017 with assessments roughly every 2.5 years, from age 11 (T1) to age 26 (T6). For this study, data from T1, T3 (age 16), and T6 were used. The majority of participants identified as having a Dutch ethnicity (89.4%) and the sample has a higher socioeconomic status than the Dutch average (Fakkel et al., 2020).

Measures

Educational level

Adolescents self-reported their educational level at age 16 (T3) and at age 26 (T6). Educational level was measured using a single item, and (ordinally) categorized as: 1) practical vocational education, 2) theoretical vocational education, 3) higher general education, and 4) (pre-)university education (Peeters et al., 2021). At age 16 (T3), the educational level in secondary school is established for most adolescents in the Dutch educational system (Schmengler et al., 2022). At age 26 (T6), most adolescents have completed their tertiary level of education, so this measure reflected educational attainment. If educational level was missing at T3, data from T2 (age 14) were used. Similarly, if educational level was missing at T6, data from T5 (age 22) were used.

Parental SES

Parental socioeconomic status was assessed at T1 using five indicators: mother's and father's educational attainment, mother's and father's occupational level based on the International Standard Classification of Occupations (ISCO-88), and family income. A single SES variable was created by averaging the items after standardization, with a higher score indicating a higher SES. This SES variable has previously been found to explain 61.2% of the variance in the five items with good internal consistency, α = 0.84 (Amone-P'Olak et al., 2009; Vollebergh et al., 2005).

Family support

Family support was assessed by combining (shortened versions of) the Family Assessment Device (FAD; Epstein et al., 1983) and the Parental Stress Index (PSI; Abidin, 1983; de Brock et al., 1992). Both the FAD and the PSI were filled out by the primary parent at T1 and T3. The FAD measures family functioning and patterns of interactions among family members. The FAD consists of 12 items (e.g., 'We avoid talking about our fears and worries'), that can be scored from 1 (Strongly disagree) to 4 (Strongly agree). A higher score on the FAD indicates poorer family functioning. The PSI measures the relative stress in the parent-adolescent relationship. The PSI consists of 23 items (e.g., 'My child seems more difficult to take care of than other children'), that can be scored from 1 (Strongly disagree) to 6 (Strongly agree). A higher score on the PSI indicates the parent commonly feels more stressed about raising their adolescent. Both the FAD (α = 0.85) and the PSI (α = 0.86) have good internal consistency. Standardized sum scores of the FAD and the PSI were combined and recoded into a single variable, with a higher score indicating more family support.

Effortful control

The primary parent reported on their adolescent's effortful control by filling out the effortful control-subscale of the Early Adolescent Temperament Questionnaire, at both T1 and T3 (EATQ-R; Hartman, 2000). This subscale consists of 11 items (e.g., "If my child has to do a difficult task, he/she starts immediately"), and can be answered from 1 ('Almost never true') to 5 ('Almost always true'). The items have good internal consistency ($\alpha =$ 0.86). A standardized sum score was calculated, with a higher score indicating better effortful control.

Peer support

Peer support was measured by adolescents' self-report on the Social Production Functions questionnaire (SPF; Lindenberg, 1996). Adolescents filled out 17 items at T1 and 11 items at T3 on behavioral confirmation and affection by classmates (e.g., "Many classmates are happy with me just the way I am"). Items were scored on a scale from 1 ('Never') to 5 ('Always'). Internal consistency among items was good at both T1 ($\alpha = 0.93$) and T3 ($\alpha = 0.84$). Items were combined into a sum score, with a higher score indicating receiving more peer support.

Statistical procedure

Assumption checks & data cleaning

As a result of left-skewed data, educational level was measured on an ordinal scale with 4 categories, and not as a continuous variable. Furthermore, the proportional odds assumption for educational level as an ordinal variable was found to be violated (after inspecting pooled Lipsitz tests, Brant-Wald tests and visual plots). Hence, a multinomial logistic regression was preferred over a polynomial logistic regression and over the pre-registered continuous structural equation model for answering our research questions (osf.io/8z9p7).

Peer support at age 11 and family support at age 16 were also non-normally distributed. After applying a power transformation and the removal of 54 outliers in total (2.4% of total participants), linearity was established between continuous predictor variables and the logit of the outcome variable for both Model 1 and Model 2 ($N = 2171$). Alternative attempts to retain outliers, such as winsorizing, did not resolve the above issues with non-normality. No multicollinearity was observed between our variables of interest (all VIF < 1.2).

Multiple imputation procedure

As a result of attrition and missing data across 15 years of data collection, observations on adolescents' educational level dropped from $N = 2229$ at T1 to $N = 2017$ at T3 (-9.5%) to $N = 1517$ at T6 (-24.8%). Similarly, observations on family support (-26.9%), effortful control (-24.3%), and peer support (-24.0%) dropped over time (from T1 to T3). Attrition was associated with being men ($\chi^2 (1) = 54.09$, $p < .001$), being older ($t (2226) = 2.24$, $p < .05$), being from a lower SES background ($t (1918) = -14.49$, $p < .001$), having less family support ($t (2036) = -2.11$, $p < .05$), and having less effortful control ($t(1981) = -5.88$, $p < .001$) at baseline.

The missing data in our dataset were not missing completely at random (Little's MCAR test; $\chi^2 = 1015.98 (490)$, $p < 0.001$). To minimize missing data bias we first performed multiple imputations on our dataset ($N = 2175$) before analyzing the multinomial logistic regressions. Variables included in the multiple imputation procedure were parental SES at T1, age at T1; family support, effortful control, and peer support at T1 and T3; and educational level at T3 and T6 (i.e., 10 variables). Predictive mean matching was the preferred imputation method of choice in order to minimize bias and yield small confidence intervals (CI) while still maintaining power (Peeters et al., 2015; Van Buuren, 2018). A total of 5 imputed datasets was obtained and split for separate analyses, after which the results were pooled (Buuren & Groothuis-Oudshoorn, 2011). Descriptive statistics (Table 4.1) and Pearson's correlations (Table 4.2) of standardized variables were obtained from the pooled imputed datasets.

Main Analyses

Two separate multinomial logistic regressions were performed as main analyses, for Model 1 and Model 2 (Figure 4.1). For both multinomial logistic regressions we performed 1) a model fitting procedure and 2) a model testing procedure. For the model fitting procedure, we used a nested model approach to assess the individual contribution of the two main predictors (i.e., parental SES and family support) and each of the four interaction terms (i.e., between parental SES and effortful control; family support and effortful control; parental SES and peer support; and family support and peer support) in Model 1 and Model 2. The model fit of the full model (4 main effects and 4 interaction effects) was compared to a nested model excluding the particular interaction effect of interest (4 main effects and 3 interaction effects). If the full model had a better fit to the data than the more parsimonious, nested model (based on the likelihood ratio test), the interaction term would be included in the final model for post-hoc group comparisons between educational levels (see Table 4.3). This *backward elimination* method is generally performed in multinomial logistic regressions before post-hoc group comparisons, to improve model fit, improve power and to reduce the number of significance tests (Tutz et al., 2015).

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Table 4.1 *Mean scores (SD) of standardized variables after multiple imputation, per educational level.*

Educational Level$_{T3}$	Practical vocational	Theoretical vocational	Higher general	Pre-University
N	673	589	428	485
Parental SES	-0.61 (0.87)	-0.17 (0.84)	0.32 (0.84)	0.75 (0.86)
Family Support$_{T1}$	-0.20 (1.07)	-0.04 (1.06)	0.05 (0.93)	0.19 (0.94)
Effortful Control$_{T1}$	-0.46 (0.92)	-0.18 (0.93)	0.18 (0.90)	0.62 (0.89)
Peer Support$_{T1}$	0.06 (1.08)	0.03 (1.06)	-0.05 (0.90)	-0.10 (0.88)
Educational Level$_{T6}$	**Practical vocational**	**Theoretical vocational**	**Higher general**	**University**
N	375	886	562	352
Parental SES	-0.67 (0.87)	-0.17 (0.92)	0.17 (0.90)	0.84 (0.83)
Family Support$_{T3}$	-0.27 (1.12)	-0.08 (1.02)	0.01 (1.01)	0.12 (0.93)
Effortful Control$_{T3}$	-0.57 (1.02)	-0.19 (0.94)	0.10 (0.95)	0.57 (0.93)
Peer Support$_{T3}$	-0.15 (1.11)	-0.02 (1.02)	0.02 (0.97)	0.10 (0.90)

Table 4.2 *Correlation matrix of main variables.*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age_{T1}										
2. Parental SES_{T1}	-0.03									
3. Family $Support_{T1}$	0.04	0.15***								
4. Family $Support_{T3}$	0.00	0.09***	0.55***							
5. Effortful $Control_{T1}$	0.04*	0.16***	0.34***	0.26***						
6. Effortful $Control_{T3}$	-0.02	0.05	0.30***	0.35***	0.54***					
7. Peer $Support_{T1}$	-0.05*	-0.05*	0.07**	0.04	0.09***	0.11***				
8. Peer $Support_{T3}$	0.01	0.07***	0.07*	0.09***	0.12***	0.13***	0.19***			
9. Educational $Level_{T3}$ [a]	0.00	0.52***	0.12***	0.07**	0.40***	0.26***	-0.06**	0.04*		
10. Educational $Level_{T6}$ [a]	0.01	0.45***	0.10***	0.07***	0.36***	0.33***	-0.05*	0.07*	0.69***	

[a] For exploratory purposes, education variables are inserted as continuous variables in this correlation matrix.

Table 4.3 *Model fitting procedure to test significance of individual model terms before testing post-hoc group comparisons.*

	df	Δχ²	
Model 1: Educational Level Age 16			
Full Model 1 versus	27		
Model without Parental SES	24	518.53	***
Model without Family Support$_{T1}$	24	12.69	**
Model without Parental SES * Effortful Control$_{T1}$	24	6.17	
Model without Family Support$_{T1}$ * Effortful Control$_{T1}$	24	3.51	
Model without Parental SES * Peer Support$_{T1}$	24	1.03	
Model without Family Support$_{T1}$ * Peer Support$_{T1}$	24	4.67	
Model 2: Educational Level Age 26			
Full Model 2 versus	27		
Model without Parental SES	24	450.27	***
Model without Family Support$_{T3}$	24	19.06	**
Model without Parental SES * Effortful Control$_{T3}$	24	2.48	
Model without Family Support$_{T3}$ * Effortful Control$_{T3}$	24	1.62	
Model without Parental SES * Peer Support$_{T3}$	24	6.09	
Model without Family Support$_{T3}$ * Peer Support$_{T3}$	24	1.09	

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; after applying the Holm-Bonferroni correction for multiple testing.

Results

Contrary to our expectations, the model fitting procedure indicated that none of the interaction effects improved the model fit (Table 4.3). Hence, none of the interaction effects were included in the final Model 1 and Model 2 for the model testing procedure (i.e., post-hoc group comparisons). In Model 1 (Table 4.4), educational level at age 16 was predicted by parental SES and family support at age 11, while controlling for main effects of effortful control and peer support at age 11. Based on the likelihood ratio test (χ^2 (9) = 937.19, $p < 0.001$), Model 1 had a good fit, and explained a considerable part of the variation in educational level at age 16 (Cox-Snell R^2 = 0.35; Nagelkerke R^2 = 0.37; McFadden R^2 = 0.15). Similarly, in Model 2 (Table 4.5), educational level at age 26 was predicted by parental SES and family support at age 16, while controlling for main effects of effortful control and peer support at age 16. Model 2 also had a good fit (LR: χ^2 (6) = 273.92, $p < 0.001$), and explained a modest part of the variation in educational level at age 26 (Cox-Snell R^2 = 0.17; Nagelkerke R^2 = 0.18; McFadden R^2 = 0.07).

In our model testing procedure, post-hoc group comparisons were made to assess if lower parental SES (RQ1.1) and less family support (RQ1.2) are risk factors for the educational level that adolescents attain. As expected (H1.1), parental SES was consistently positively associated with educational level at age 16 and age 26 (in 12 out

of 12 post-hoc comparisons). Contrary to our expectations (H1.2), family support at age 11 and age 16 was mostly not associated with educational level at age 16 and age 26 respectively (in 9 out of 12 comparisons). Moreover, family support at age 11 and age 16 was in part negatively associated with educational level at age 16 and age 26 (in 3 out of 12 comparisons) – opposite to our expectations. In particular, adolescents who reported higher levels of family support were more likely to end up in practical vocational education instead of in (pre-)university education

Though the main effects of effortful control and peer support were not part of our hypotheses, their inclusion and interpretation as control variables are relevant for understanding our (null) findings. Effortful control (at age 11 and 16) was consistently positively associated with educational level (at age 16 and age 26) (in 12 out of 12 comparisons). Peer support at age 11 and age 16 was mostly not associated with educational level at age 16 and age 26 (in 10 out of 12 comparisons), or negatively associated (2 out of 12). Those adolescents who reported higher levels of peer support at age 11 had increased odds to end up in practical or theoretical vocational education instead of pre-university education at age 16.

Table 4.4 *Post-hoc comparisons of parental SES, family support, effortful control, and peer support at age 11 between educational levels at age 16 (Model 1).*

	Estimate		SE	Wald z-value	df	OR
Practical vocational vs. Theoretical vocational						
Intercept	0.23	***	0.08	3.064	125.19	1.26
Parental SES	0.62	***	0.07	8.373	173.98	1.87
Family Support$_{T1}$	-0.06		0.07	-0.906	84.12	0.94
Effortful Control$_{T1}$	0.41	***	0.07	5.732	459.44	1.51
Peer Support$_{T1}$	-0.06		0.06	-1.004	304.23	0.94
Practical vocational vs. Higher general						
Intercept	-0.13		0.08	-1.551	163.59	0.88
Parental SES	1.29	***	0.10	11.898	24.68	3.62
Family Support$_{T1}$	-0.21		0.08	-2.636	251.73	0.81
Effortful Control$_{T1}$	0.95	***	0.09	10.876	457.79	2.58
Peer Support$_{T1}$	-0.20		0.07	-2.687	637.76	0.82
Practical vocational vs. Pre-university						
Intercept	-0.59	***	0.10	-5.844	131.27	0.56
Parental SES	1.92	***	0.12	16.560	41.35	6.85
Family Support$_{T1}$	-0.28	***	0.08	-3.383	1985.17	0.75
Effortful Control$_{T1}$	1.54	***	0.11	13.845	49.41	4.69
Peer Support$_{T1}$	-0.31	***	0.09	-3.675	180.19	0.73
Theoretical vocational vs. Higher general						
Intercept	-0.36	***	0.07	-5.152	803.85	0.70
Parental SES	0.66	***	0.09	7.439	58.20	1.94
Family Support$_{T1}$	-0.15		0.08	-1.940	424.79	0.86
Effortful Control$_{T1}$	0.54	***	0.09	6.184	100.81	1.71
Peer Support$_{T1}$	-0.14		0.07	-1.976	1976.70	0.87
Theoretical vocational vs. Pre-university						
Intercept	-0.82	***	0.10	-8.265	64.62	0.44
Parental SES	1.30	***	0.10	13.132	91.33	3.67
Family Support$_{T1}$	-0.22		0.09	-2.571	176.91	0.80
Effortful Control$_{T1}$	1.13	***	0.11	10.671	38.66	3.10
Peer Support$_{T1}$	-0.25	**	0.08	-3.237	561.57	0.78
Higher general vs. Pre-university						
Intercept	-0.46	***	0.10	-4.733	236.07	0.52
Parental SES	0.64	***	0.09	7.411	1447.76	1.60
Family Support$_{T1}$	-0.07		0.08	-0.895	320.53	0.79
Effortful Control$_{T1}$	0.60	***	0.10	6.010	47.04	1.49
Peer Support$_{T1}$	-0.12		0.08	-1.506	574.09	0.76

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; after applying the Holm-Bonferroni correction for multiple testing.

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Table 4.5 *Post-hoc comparisons of parental SES, family support, effortful control, and peer support at age 16 between educational levels at age 26 (Model 2).*

	Estimate		SE	Wald z-value	df	OR
Practical vocational vs. Theoretical vocational						
Intercept	1.31	***	0.09	14.271	113.234	3.70
Parental SES	0.68	***	0.11	6.142	13.154	1.98
Family Support$_{T3}$	-0.09		0.08	-1.118	46.602	0.92
Effortful Control$_{T3}$	0.48	***	0.11	4.552	16.012	1.62
Peer Support$_{T3}$	0.06		0.08	0.738	23.317	1.06
Practical vocational vs. Higher general						
Intercept	0.84	***	0.09	8.815	159.893	2.31
Parental SES	1.16	***	0.130	8.852	12.013	3.18
Family Support$_{T3}$	-0.22		0.08	-2.667	230.817	0.80
Effortful Control$_{T3}$	0.91	***	0.11	8.140	23.366	2.49
Peer Support$_{T3}$	0.05		0.11	0.414	12.127	1.05
Practical vocational vs. University						
Intercept	-0.29	*	0.13	-2.226	97.738	0.75
Parental SES	2.10	***	0.15	13.805	18.097	8.18
Family Support$_{T3}$	-0.37	**	0.10	-3.558	116.463	0.69
Effortful Control$_{T3}$	1.56	***	0.14	11.251	23.202	4.74
Peer Support$_{T3}$	0.02		0.10	0.167	53.792	1.02
Theoretical vocational vs. Higher general						
Intercept	-0.47	***	0.07	-6.787	31.797	0.62
Parental SES	0.47	***	0.07	7.164	30.408	1.61
Family Support$_{T3}$	-0.13		0.07	-1.809	41.574	0.88
Effortful Control$_{T3}$	0.43	***	0.07	6.240	197.019	1.54
Peer Support$_{T3}$	-0.01		0.07	-0.199	23.137	0.96
Theoretical vocational vs. University						
Intercept	-1.60	***	0.10	-15.751	325.863	0.20
Parental SES	1.42	***	0.10	14.684	328.023	4.13
Family Support$_{T3}$	-0.29	**	0.08	-3.403	395.377	0.75
Effortful Control$_{T3}$	1.08	***	0.09	11.422	159.776	2.93
Peer Support$_{T3}$	-0.04		0.07	-0.557	1793.650	0.96
Higher general vs. University						
Intercept	-1.13	***	0.11	-9.989	83.586	0.32
Parental SES	0.94	***	0.09	10.228	1226.192	2.57
Family Support$_{T3}$	-0.15		0.09	-1.731	109.937	0.86
Effortful Control$_{T3}$	0.64	***	0.09	7.353	964.593	1.90
Peer Support$_{T3}$	-0.03		0.09	-0.298	37.258	0.97

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; after applying the Holm–Bonferroni correction for multiple testing.

Sensitivity analyses

To test the robustness of our findings, we performed two sensitivity analyses (per model): a multinomial logistic regression on complete cases, and a multinomial logistic regression without influential cases. For the analysis on complete cases, the multinomial logistic regression was performed only on those participants with no missing data on all variables of interest. Model 1 was reanalyzed on $N = 1,712$ participants with complete data on parental SES, family support, effortful control, and peer support at age 11, and educational level at age 16. Model 2 was reanalyzed on $N = 1,145$ participants with complete data on parental SES, family support, effortful control, and peer support at age 16, and educational level at age 26. Though minor differences were observed, the overall conclusions of both the original analysis and the complete cases analysis are similar (see Supplementary Materials A for more details).

For the analysis without influential cases, participants were removed from the multiple imputed dataset if they had a Cook's $D > 4$. A Cook's D of > 4 indicates that the extraordinary combination of scores from a participant directly influences regression coefficients. For Model 1, influential cases ($n = 87$; 3.9%) were for example adolescents in higher general education, with a very high parental SES, low family support, low effortful control, and high peer support. Influential cases in Model 2 ($n = 97$; 4.4%) were similarly characterized, but also included young adults with a low parental SES but high effortful control that ended up in university education. After rerunning the multinomial logistic regression on Model 1 and Model 2 without influential cases, results were mostly similar to the original analysis, except that we found adolescents with more peer support at age 11 had increased odds of ending up in a lower educational level at age 16 (in 4 out of 6 comparisons). See Supplementary Materials B for more details.

DISCUSSION

According to the *family stress model* (Conger & Donnellan, 2007), adolescents with a lower parental SES and less family support are less likely to attain a higher educational level. In this study, we investigated if adolescents' effortful control and peer support mitigate the potential negative effect of low parental SES on educational level and mitigate the potential negative effect of low family support on educational level, in mid-adolescence and in young adulthood. Results indicated that adolescents with a lower parental SES were more likely to be in a lower educational level, but family support was mostly not associated with educational level. These findings did not vary with effortful control or peer support. Hence, effortful control and peer support did not buffer against the effect of parental SES or family support on educational level. However, adolescents with

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more effortful control were consistently more likely to end up in a higher educational level, whereas peer support was mostly not associated with educational level. Overall conclusions are consistent across developmental timespans, but with some more variation (inconsistencies) in findings in mid-adolescence than in young adulthood.

Theoretical implications

Our finding that adolescents with a lower parental SES were more likely to be in a lower educational level is in line with the *family investment model* (Conger & Donnellan, 2007). Adolescents with a lower parental SES may have access to fewer material resources, such as computer devices, learning materials, a personal workspace, or extracurricular activities, whereas such opportunities are more common for adolescents with a higher parental SES. Such investments are particularly helpful for adolescents during critical periods, such as when transitioning from primary to secondary education or from secondary to tertiary education. Moreover, during these critical periods, parents with a higher SES are generally better at advocating for their adolescents, which may result in admission to more favorable educational level in case of ambiguity. As such, adolescents with a lower parental SES may end up in a lower educational level than adolescents with a higher parental SES, even when competencies are somewhat similar. However, it has also been argued that parents have a higher SES as a result of having more competencies, and that these competencies are genetically transmitted to their adolescents, subsequently resulting in the attainment of higher educational levels (Krapohl & Plomin, 2016).

Contrary to theoretical and empirical claims of the *family stress model* (Conger & Donnellan, 2007; Martin et al., 2010), we found that the educational level that adolescents end up in is mostly unaffected by family support. Despite experiences of family conflicts, misunderstandings, and tension at home (i.e., less family support), adolescents have a similar chance to end up in a higher educational level as adolescents with more family support. Our findings suggest that financial resources and experience that parents can invest in their adolescent may be more beneficial towards attaining a higher educational level than social-emotional support.

Three characteristics of our data may nuance this conclusion. First, our measure of family support relies on parent report, whereas adolescents could report different experiences (Kevenaar et al., 2021). For example, parents might feel as if it is possible to openly discuss emotions at home, or family members to fully trust and accept each other, whereas adolescents might report otherwise. Second, a large majority of parents reported high levels of family support, and only a small minority of parents reported moderate to low family support. This null finding might not be extrapolated to adolescents with low family support, for which we missed representation. Third, for some comparisons in our multinomial logistic regressions adolescents with more family support had an

increased chance of ending up in a lower educational level (e.g., practical vocational versus university education) – opposite to the positive zero-order correlations between family support and educational level. Our finding that after controlling for parental SES, effortful control, and peer support, the unique association between family support and educational level is negative on two instances may be indicative of a suppressor effect (Ludlow & Klein, 2014; Pandey & Elliott, 2010). Alternatively, there may be an optimal level of family support, beyond which support may be indicative of overly involved parents that allow insufficient opportunities for their adolescents to struggle and learn on their own (Castro et al., 2017) or may be explained by confounding factors, such as health issues or learning issues. Future research should include adolescent reports on family support, and investigate samples with more variance in family support.

Our findings also underline effortful control to be a compensatory source of resilience more so than a protective source of resilience (Fergus & Zimmerman, 2005; Schmengler et al., 2021). Effortful control does not mitigate the negative effect of a low parental SES on educational level (i.e., protective effect), but does have a positive direct effect on educational level – regardless of SES (i.e., compensatory effect). Our findings thus nuance the idea that through the development of particular psychosocial competencies adolescents from disadvantaged backgrounds can have similar opportunities to attain a higher educational level as those adolescents from more privileged backgrounds (Duckworth & Schoon, 2012; Tough, 2012).

Similarly, peer support did not moderate the associations between parental SES and educational level or between family support and educational level, contradicting our expectations of peer support as a buffering mechanism against risk factors. Though strong peer support is generally considered as a positive factor for adolescent well-being (Buchanan & Bowen, 2008), it may in itself be an insufficient buffer against structural adversity, or be relatively unimportant for educational selection . Alternatively, strong peer support may in part be based on externalizing behaviors that promote popularity, such as skipping school (Martinot et al., 2022; Wang & Degol, 2014). Such types of peer support may explain why adolescents with more peer support had an increased chance of ending up in theoretical or practical vocational education instead of (pre-)university education, though the majority of our findings indicate no association between peer support and educational level.
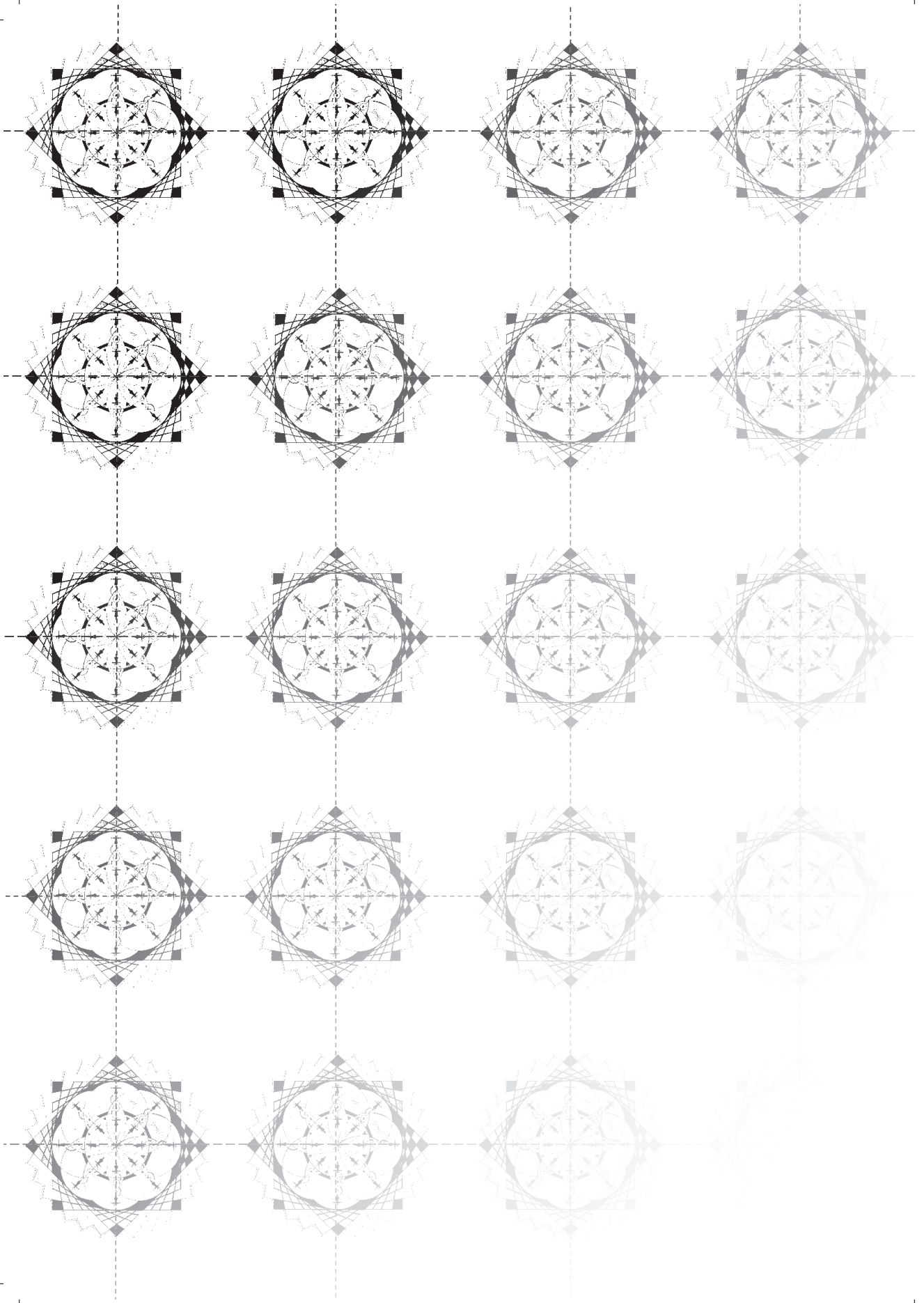
Strengths and limitations

The findings of our study must be interpreted in light of its inherent strengths and limitations. Strengths of our study include the longitudinal nature of the data, the large sample size, and the robustness of findings. An important limitation of our study is the attrition bias, which is mostly due to drop-out over time. The attrition bias in our sample

is reflected by a skewed drop-out of older, male participants with a lower parental SES and less family support. Though partly inevitable, we strived to keep this bias at a minimum by performing predictive mean matching. Furthermore, a number of outliers that prevented a normal distribution and a number of influential cases that individually affected model estimates were removed from analyses – adding to a skewed attrition. However, the number of excluded cases was a small proportion (2.4%) and considered essential to obtain reliable model estimates. Given the consistency of findings across main analyses and sensitivity analyses, we believe these exclusions did not considerably impact our findings.

Regarding the educational level in young adulthood (T6), initial missings were replaced by known educational level two years (T5). Remaining missings were resolved in the predictive mean matching procedure. Though this 'last observation carried forward' approach may potentially wrongly assume some individuals to still be in a certain educational level, we believe this approach is a better alternative than removing the participant all together or instant imputation, thereby ignoring available historic information. Overall, these limitations of our study have been kept at a minimum and have not considerably impacted our main findings and conclusions.

CONCLUSION

Our findings suggest that adolescents with a lower parental SES or less family support may benefit more from developing stronger effortful control than by increasing support from family or peers, in terms of attaining a higher educational level. Adolescents with a lower parental SES benefit from having strong effortful control, but not more so than adolescents with a higher parental SES and strong effortful control. Family support and peer support were occasionally negatively associated with educational level, suggesting that the type of support or reason for support may matter for its effect on educational level. Effortful control may be an important target for intervention, though it is important to emphasize that effortful control has a considerable genetic component (Willems et al., 2018) and that developing effortful control is particularly challenging in a low SES context or in the absence of sufficient family support (Ellis et al., 2017). Lastly, our findings emphasize that individual characteristics, such as effortful control and peer support, do not fully compensate socioeconomic inequalities in educational attainment – and that perhaps more structural changes are required.

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CHAPTER 5

INTERGENERATIONAL UPWARD AND DOWNWARD SOCIAL MOBILITY: THE ROLE OF INTELLIGENCE, EFFORTFUL CONTROL, ASSERTIVENESS, AND SOCIAL COMPETENCE IN EARLY ADOLESCENCE

Author Contributions:
MF: Investigation, Conceptualization, Methodology, Formal analysis, Writing – original draft, Writing – review & editing, Visualization.
SB: Investigation, Conceptualization, Methodology, Writing – original draft, Writing – review & editing.
WAMV: Conceptualization, Methodology, Writing – original draft, Writing – review & editing.
GWJMS: Investigation, Conceptualization, Supervision, Methodology, Writing – original draft, Writing – review & editing.
MP: Project administration, Conceptualization, Methodology, Writing – original draft, Writing – review & editing.

ABSTRACT

Relatively little is known about which competencies adolescents need to experience intergenerational social mobility. We investigated if intelligence, effortful control, assertiveness, and social competence at age 11 was associated with upward or downward mobility at age 26, utilizing data from the TRAILS study ($N = 2,229$; $age_{T1} = 11.1$ ($SD = 0.55$); 50.8% girls). Results from our multinomial logistic regressions indicate that intelligence and effortful control, but not social competence, are associated with upward mobility. Only intelligence was associated with downward mobility. Having dissimilar levels of competence than peers with the same parental SES was more important for social mobility than having similar competencies as peers with the same young adulthood SES. Social mobility thus happens primarily based on competence. However, given the importance of genetic predispositions and socioeconomic environment for intelligence and effortful control, and the limited appreciation of alternative competencies, social mobility remains to some extent unmeritocratic.

Keywords: social mobility, socioeconomic status (SES), adolescence, intelligence, effortful control, assertiveness, peer competence

INTRODUCTION

An important topic of debate is to which extent adolescents with similar competencies end up in a similar educational level, despite differences in parental socioeconomic status (SES), or if adolescents with a lower parental SES need more competencies than adolescents with a higher parental SES to end up in a similar educational level (Kay et al., 2017). According to the meritocracy hypothesis, adolescents with a lower parental socioeconomic status (SES) but with a high level of competencies – such as intelligence, effortful control, and social competence – should be as likely to attain university education as adolescents with a higher parental SES and similar competencies (e.g., Young, 2011). However, according to the glass ceiling/glass floor hypothesis, some adolescents with a lower parental SES experience difficulties moving into a higher educational level (upward social mobility) despite possessing adequate levels of intelligence, effortful control, and social competence (e.g., Reeves & Howard, 2013). Similarly, some adolescents with a high parental SES are prevented from moving into a lower educational level (downward social mobility) even if their competencies would require so (Bourne et al., 2018).

An important but relatively understudied question is therefore how adolescents who experience social mobility are different from peers who experience social reproduction (i.e., young adulthood SES being similar to parental SES). In this study, we investigate if early adolescent intelligence, effortful control, and social competence affect social mobility in young adulthood; and to what extent social mobility happens in line with meritocratic principles.

Intergenerational transmission of socioeconomic status

Early adolescence is an important developmental period with regard to intergenerational SES transmission, as adolescents gradually move away from their parents' SES and into their own young adulthood SES (Senia et al., 2016). The similarity between parental SES and young adulthood SES may be the result of material investments (*family investment model*) and economic stress (*family stress model*) that adolescents experience at home (Conger & Donnellan, 2007). Adolescents with a higher parental SES are generally provided with ample material investments and specific parental support which helps to eventually attain a high educational level in young adulthood, in contrast to adolescents with a lower parental SES who may grow up with fewer opportunities, and more economic hardships, financial stress, and conflicts at home.

Besides, socioeconomic differences in educational quality are commonly observed. For example, teachers may have certain expectations regarding adolescent's potential, in part based on their socioeconomic background (Auwarter & Aruguete, 2008). Especially when test scores are somewhat ambiguous, adolescents with a higher SES are more likely

to enroll in a higher educational level than adolescents from a lower SES (Zumbuehl et al., 2022). Furthermore, at schools with predominantly adolescents from a lower SES background, the quality of education tends to be lower, with more students per teacher, less opportunities for additional tutoring, and complicated (or absent) structures for moving up an educational level (Qin & Bowen, 2019; Visser et al., 2022). Hence, the socioeconomic context in which adolescents develop may broadly impact the trajectory towards young adulthood SES.

Nonetheless, some variation in competence is observed among adolescents with the same socioeconomic background. As a result, adolescents with a lower parental SES but high levels of competence may experience upward mobility, and adolescents with a higher parental SES but relatively low levels of competence may experience downward mobility.

Intelligence, Effortful Control and Social Competence as facilitators of Social Mobility

Approximately half of Dutch adolescents attain a similar educational level as their parents, in line with global averages (OECD, 2018; Weinberg et al., 2019). Approximately 1 in 3 Dutch adolescents eventually end up in the same income quintile as their parents, in line with European averages (Van den Brakel & Moonen, 2013). That means that a considerable portion of adolescents experience social mobility, potentially as a result of displaying certain individual competencies. Intelligence, effortful control, and social competence in adolescence are consistently linked to academic success, as well as overall increased chances of experiencing social mobility (Blair & Razza, 2007; Breen & Goldthorpe, 2001).

Intelligence – often measured as IQ – reflects one's cognitive abilities that facilitate learning and grasping abstract concepts (e.g., Hassler & Mora, 2000). Such cognitive abilities help adolescents perform well in an academic or school setting, and are also useful assets in a later occupational setting (Jencks et al., 1983). Besides intelligence, effortful control – or an individual's ability to remain focused on a particular task without getting distracted (Eisenberg et al., 2005) – is important for adolescents to experience success in academic endeavors (Stadler et al., 2016). Effortful control reflects an adolescent's capacity for prolonged attention (i.e., attentional control) as well as the ability to express a conscious thought or behavior over an impulsive one (i.e., inhibitory control) (Muris & Ollendick, 2005). Such competencies help adolescents prioritize (or balance) long-term goals, such as pending school assignments, over short-term leisure activities such as staying out late with friends (Andersson & Bergman, 2011).

Social competencies, such as assertiveness and peer competence, may also be relevant for facilitating social mobility (Bukodi et al., 2019). Assertiveness – or the extent to which adolescents can pro-actively communicate their needs, wants, and opinions

(Arrindell & Vanderende, 1985) – may be of importance for experiencing upward mobility. Assertive adolescents tend to ask for support or additional challenges related to school assignments, while also being able to effectively communicate disagreement about school rules, grading, or expectations (Elliott & Gresham, 2013). For example, assertive adolescents may tackle bureaucratic challenges or regulate their own learning and mobility structure in concordance with schools and teachers. As such, assertive adolescents increase their own efficacy, which facilitates academic performance (González Fragoso et al., 2018), and also extends into occupational success (Woods & Sofat, 2013).

Peer competence may be another aspect of social competence that promotes social mobility (Senia et al., 2016). Peer competence refers to the capacity to act in an effective and appropriate manner with peers, given the social context (Fabes et al., 2006; Rose-Krasnor, 1997). A high level of peer competence in early adolescence may indicate that one has sufficient social support as well as the skills to navigate social situations with people from various socioeconomic backgrounds, which is inherent to social mobility (Friedman, 2014).

Given the importance of these competencies for educational and occupational success, adolescents with similar levels of intelligence, effortful control, and social competence in early adolescence would be expected to attain a similar young adulthood SES – even if their parental SES may differ. Instead of such a meritocratic stratification, adolescents' parental SES may limit social mobility, urging adolescents to have more extraordinary levels of competence in order to experience social mobility (Breen & Goldthorpe, 1999). For example, adolescents with a lower parental SES may experience structural barriers ('glass ceiling'), such as lack of resources, tensions at home, poorer quality education, and possible teacher prejudice, that require much higher levels of intelligence, effortful control, and assertiveness than that of adolescents with a higher parental SES to end up in the same young adulthood SES (Conger & Donnellan, 2007). Similarly, adolescents with a higher parental SES may experience structural benefits ('glass floor'), such as plenty of resources, a stable and comfortable home situation with supportive, assertive parents, higher quality education including private tutoring, and positive teacher expectations, which may all help prevent downward mobility even if competencies are relatively low (Scherger & Savage, 2010).

Present Study

The aim of this study was to investigate if intelligence, effortful control, and social competence in early adolescence are associated with upward mobility and with downward mobility in young adulthood, and how much of these competencies adolescents need relative to peers in order to experience social mobility. For both

upward mobility and downward mobility, we will contrast two competing hypotheses: the meritocracy hypothesis versus the glass ceiling/glass floor hypothesis.

According to the *meritocracy hypothesis* (Blau & Duncan, 1967; Saunders, 1997), we would expect to find that adolescents are more likely to experience upward mobility if they have a higher level of intelligence, effortful control, and social competence than peers in their origin group (i.e., same parental SES), and a similar level of intelligence, effortful control, and social competence as peers in their destination group (i.e., same young adulthood SES). Similarly, adolescents are more likely to experience downward mobility if they have a lower level of intelligence, effortful control, and social competence than peers in their origin group, and a similar level of intelligence, effortful control, and social competence as peers in their destination group.

According to the *glass ceiling hypothesis* (e.g., Gugushvili et al., 2017), we would expect to find that adolescents are only more likely to experience upward mobility if their level of intelligence, effortful control, and social competence is higher than that of peers in their origin group and *also* higher than that of peers in their destination group. Similarly, according to the *glass floor hypothesis*, we expect to find that adolescents only experience downward mobility if they have a lower level of intelligence, effortful control, and social competence than peers in their origin group *and* than peers in their destination group. Alternatively, we may find that intelligence, effortful control, or social competence are mostly unrelated to upward or downward mobility – neither supporting the meritocracy hypothesis or the glass ceiling/glass floor hypothesis.

METHOD

Participants and Procedure

Data from two waves (T1 and T6) of the TRacking Adolescents' Individual Lives Survey (TRAILS) were used. TRAILS is a population-based prospective cohort study that follows the development of adolescents (and their families) in Groningen, the northern region of the Netherlands (Oldehinkel et al., 2015). A total of 3134 eligible adolescents were identified after combining municipality registers and school registers (i.e., 90.3% of all eligible adolescents in the selected municipalities). Adolescents and their families were first informed about (the purpose of) the TRAILS study through school visits and brochures, after which telephone calls were made to inquire about participation and answer any remaining questions. This recruitment approach resulted in the inclusion of 2229 adolescents and their families (71.1% of eligible adolescents). Written informed consent was obtained from both adolescents and their parents prior to inclusion in the

study. Ethical approval for TRAILS was obtained from the Dutch national ethics committee Central Committee on Research Involving Human Subjects (#NL38237.042.11).

Adolescents in the baseline sample (N = 2229; M_{age} = 11.1, SD = 0.55; 50.8% girls) were followed between 2000 and 2017 with assessments roughly every 3 years, from age 11 (T1) to age 26 (T6). The majority of participants identified as having a Dutch ethnicity (89.4%) and the sample has a higher socioeconomic status than the Dutch average (Fakkel et al., 2020).

Out of N = 2229 participants at T1, 43 participants did not provide information on parental SES (1.9%), 712 on educational level (at T6) (31.9%), 9 on IQ (0.4%), 178 on effortful control (8.0%), 34 on social competence (1.5%), and 302 on assertiveness (13.5%). Assertiveness scores were obtained through teacher reports, which explains the relatively high number of missing values. Compared to participants that were retained from T1 to T6, participants who dropped out (n = 712; 31.9%) were more likely to be boys (χ^2 (1) = 54.09, p < .001), older (t (2226) = 2.24, p = 0.03), from a lower SES background (t (2184) = -14.49, p < .001), with a lower IQ (t (2218) = -13.28, p < .001), lower effortful control (t (2049) = -3.31, p < .001), and lower assertiveness (t (1925) = -8.41, p < .001).

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Measures

Social mobility

Participants were categorized in 1 of 9 groups, depending on their parental SES at age 11 and their educational attainment at age 26. Parental SES was assessed at T1 using five indicators: family income, mother's and father's educational attainment, and mother's and father's occupational level (based on the ISCO-88). Previous use of this SES variable explained 61.2% of the variance in the five indicators with good internal consistency, α = 0.84 (Amone-P'Olak et al., 2009; Vollebergh et al., 2005). The factor score of parental SES was split into three ordinal categories of equal size, i.e., low, middle, and high parental SES.

Educational attainment was self-reported by adolescents at age 26 (T6). Educational level was measured using a single item, and (ordinally) categorized as lower (practical vocational education), middle (theoretical vocational education), and higher (college/university), representing adolescents' social destination group in young adulthood. If educational level was missing at T6, data on educational level from T5 (age 22) was used.

Combining the 3 categories of parental SES and 3 categories of educational attainment yielded 9 categories of social mobility: low/middle, low/high, middle/high, high/middle, high/low, and middle/low; and low/low, middle/middle, high/high (the latter three groups technically representing social reproduction and not mobility).

Intelligence

Intelligence was measured using two subtests from the Wechsler Intelligence Scale for Children (WISC-R; Silverstein, 1973), i.e., the subtests on verbal intelligence and spatial intelligence. Scores were combined into an intelligence quotient (IQ), to approximate adolescent intelligence.

Effortful control

The primary parent reported on their adolescent's effortful control by filling out the effortful control-subscale of the Early Adolescent Temperament Questionnaire, at both T1 and T3 (EATQ-R; Hartman, 2000). This subscale consists of 11 items (e.g., "If my child has to do a difficult task, he/she starts immediately"), and can be answered from 1 ('Almost never true') to 5 ('Almost always true'). The items have good internal consistency ($\alpha = 0.86$). A standardized sum score was calculated, with a higher score indicating better effortful control.

Assertiveness

Assertiveness was measured by using teacher report on the assertiveness subscale of the Social Skills Rating System (SSRS; Gresham & Elliot, 1990) questionnaire. The assertiveness subscale consists of 10 items (e.g., "This student tells you in an appropriate manner if he/she feels to have been treated unfairly") that are answered on a scale from 1 ('Never') to 3 ('Very often'). Items are combined into an average score, with a higher score indicating more assertiveness. The internal consistency of the subscale can be considered as good, $\alpha = 0.88$.

Peer Competence

Peer competence was measured by adolescents' self-report on the Social Problems subscale of the Youth Self-Report (YSR; Achenbach & Rescorla, 2001) questionnaire. This subscale consists of 11 items (e.g., "Can't get along with other boys/girls") that are rated on an answer scale from 0 ('Not at all') to 2 ('Clearly or Often'). After recoding all items, an average score of social competence was obtained, with a higher score indicating more peer competence. Internal consistency of the items is regarded as good, $\alpha = 0.71$.

Strategy of analysis

A multiple imputation procedure was performed to minimize biases resulting from attrition and missing data. Variables included in the multiple imputation procedure were parental SES, age, assertiveness, effortful control, social competence, and IQ at T1,

and educational level at T6 (i.e., 7 variables). A large number of high scores resulted in a left-skewed distribution for social competence, which was resolved (before multiple imputation) by applying a square root transformation (Mangiafico, 2016). Predictive mean matching was the preferred imputation method to minimize bias and yield small confidence intervals (CI) while still maintaining power (Peeters et al., 2015; Van Buuren, 2018). A total of 5 imputed datasets was obtained and split for separate analyses, after which the results were pooled (Buuren & Groothuis-Oudshoorn, 2011).

We performed two multinomial logistic regressions (i.e., for upward mobility and for downward mobility), each consisting of a model selection procedure and a model testing procedure (i.e., post-hoc group comparisons). For model selection, backward elimination was used to assess if each predictor contributes to the model (i.e., explains unique variance). A full model with all four predictors was sequentially tested against a nested, more parsimonious model excluding one of the predictors (see Table 5.3). If the likelihood ratio test indicated that the model fit of the full model was better than the model fit of the nested model, then the predictor was retained in the final model. For both the upward mobility and the downward mobility model, we found that IQ, effortful control, and assertiveness explained unique variance in social mobility, but social competence did not. Hence, IQ, effortful control, and assertiveness were selected into our final models to predict upward and downward mobility.

Based on the likelihood ratio test (χ^2 (15) = 504.87, p < 0.001), the upward mobility model (Table 5.3) had a good fit to the data, and explained a considerable part of the variation in upward mobility at age 26 (Cox-Snell R^2 = 0.24; Nagelkerke R^2 = 0.24; McFadden R^2 = 0.08). The downward mobility model also had a good fit to the data (LR: χ^2 (15) =111.06, p < 0.001), but explained less of the variation in downward mobility at age 26 (Cox-Snell R^2 = 0.08; Nagelkerke R^2 = 0.08; McFadden R^2 = 0.02).

For model testing, the effect of each predictor was then evaluated in post-hoc group comparisons, separately for upward mobility and downward mobility. We contrasted 3 groups of upward mobile adolescents (i.e., low/high, low/middle, middle/high) to their social origin group (i.e., low/low, middle/middle) and their social destination group (i.e., middle/middle, high/high), on IQ, effortful control, and assertiveness (see Table 5.4). Similarly, we contrasted 3 groups of downward mobile adolescents (i.e., high/low, high/middle, middle/low) to their social origin group (i.e., high/high, middle/middle) and their social destination group (i.e., middle/middle, low/low), on IQ, effortful control, and assertiveness (see Table 5.5).

RESULTS

Descriptive statistics (Table 5.1) and Pearson's correlations (Table 5.2) of standardized variables were obtained from the pooled imputed datasets. Approximately 47.5% of participants experienced social reproduction (i.e., educational attainment in line with parental SES), 36% experienced upward mobility (i.e., higher educational attainment in young adulthood than expected based on parental SES), and 16.5% experienced downward mobility (i.e., lower educational attainment in young adulthood compared to parental SES). At baseline, parental SES appeared to be positively associated with intelligence, effortful control, and assertiveness, but not with peer competence. During model selection, peer competence did not explain variation in social mobility, and was thus excluded from the final models and post-hoc comparisons of upward mobility and downward mobility (see Table 5.3).

Table 5.1 *Descriptive statistics of variables of interest after multiple imputation.*

Social Mobility	*N*	Parental SES	Intelligence	Effortful Control	Asser-tiveness	Peer Competence
Total	2229	1.89 (0.80)	97.2 (15.0)	3.58 (0.54)	2.23 (0.43)	1.08 (0.14)
Stable	*1056*	*2.08 (0.83)*	*97.6 (15.9)*	*3.60 (0.54)*	*2.25 (0.44)*	*1.08 (0.14)*
High/High	478	2.84 (0.33)	106.5 (13.0)	3.72 (0.52)	2.40 (0.40)	1.09 (0.14)
Middle/Middle	345	1.89 (0.22)	95.7 (12.5)	3.54 (0.51)	2.23 (0.41)	1.08 (0.13)
Low/Low	239	0.89 (0.36)	83.0 (13.3)	3.40 (0.52)	2.00 (0.42)	1.06 (0.15)
Upward	*804*	*1.36 (0.53)*	*97.1 (13.7)*	*3.62 (0.55)*	*2.22 (0.43)*	*1.08 (0.14)*
Low/Middle	329	1.00 (0.35)	92.3 (12.6)	3.54 (0.56)	2.11 (0.41)	1.07 (0.15)
Low/High	173	1.05 (0.32)	97.7 (14.4)	3.67 (0.57)	2.23 (0.42)	1.07 (0.14)
Middle/High	293	1.93 (0.22)	101.7 (12.9)	3.65 (0.51)	2.34 (0.42)	1.08 (0.12)
Downward	*369*	*2.47 (0.47)*	*96.0 (14.9)*	*3.48 (0.53)*	*2.20 (0.43)*	*1.08 (0.13)*
High/Low	39	2.65 (0.29)	92.5 (14.4)	3.40 (0.50)	2.03 (0.39)	1.07 (0.13)
High/Middle	]228	2.70 (0.31)	99.4 (14.3)	3.53 (0.55)	2.30 (0.40)	1.07 (0.14)
Middle/Low	105	1.86 (0.21)	89.9 (14.2)	3.43 (0.49)	2.03 (0.44)	1.09 (0.12)

Table 5.2 *Correlation matrix.*

	Age	Parental SES	Intelligence	Effortful Control	Asser-tiveness	Peer Competence
Age						
Parental SES	-0.03					
Intelligence	-0.08***	0.39***				
Effortful Control	-0.04	0.08***	0.06*			
Assertiveness	0.02	0.26***	0.25***	0.10***		
Peer Competence	0.02	0.03	-0.05*	0.34***	0.11***	

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table 5.3 *Testing intelligence, effortful control, assertiveness, and peer competence in the model selection process before model testing.*

	df	$Δχ^2$	*p*-value
Upward Mobility	20		
Model without Intelligence	15	415.63	< 0.001
Model without Effortful Control	15	42.94	< 0.001
Model without Assertiveness	15	69.42	< 0.001
Model without Peer Competence	15	5.21	0.412
Downward Mobility	16		
Model without Intelligence	12	357.47	<0.001
Model without Effortful Control	12	42.79	<0.001
Model without Assertiveness	12	60.68	<0.001
Model without Peer Competence	12	6.41	0.323

N.B. *p*-values have been corrected for multiple testing using the Holm-Bonferroni method. Age and gender were included as covariates.

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Table 5.4 *Multinomial logistic regression for upward mobility. Reference group is compared to both origin group and destination group.*

Upward Mobility	Estimate	SE	Wald z-value	df	OR
Reference group: Low/High					
Low/Low					
Intercept	-2.80	3.01	-0.93	17	0.06
Intelligence	-1.25 ***	0.15	-8.61	108	0.29
Effortful Control	-0.50 **	0.15	-3.33	18	0.61
Assertiveness	-0.43	0.19	-2.22	9	0.65
High/High					
Intercept	-1.77	2.13	-0.83	69	0.17
Intelligence	0.72 ***	0.11	6.39	370	2.06
Effortful Control	0.10	0.10	1.04	276	1.11
Assertiveness	0.28	0.13	2.13	18	1.33
Reference group: Low/Middle					
Low/Low					
Intercept	-1.25	3.01	-0.42	9	0.29
Intelligence	-0.79 ***	0.14	-5.69	26	0.45
Effortful Control	-0.28	0.15	-1.83	10	0.76
Assertiveness	-0.19	0.12	-1.59	29	0.83
Middle/Middle					
Intercept	4.45 *	2.12	2.09	22	85.28
Intelligence	0.25	0.11	2.30	45	1.29
Effortful Control	-0.02	0.10	-0.16	31	0.98
Assertiveness	0.24 **	0.09	2.62	135	1.27
Reference group: Middle/High					
Middle/Middle					
Intercept	3.58 *	1.81	1.98	152	36.05
Intelligence	-0.54 ***	0.10	-5.31	299	0.58
Effortful Control	-0.25 **	0.09	-2.81	123	0.78
Assertiveness	-0.21	0.11	-1.88	28	0.81
High/High					
Intercept	-1.09	1.55	-0.70	707	0.34
Intelligence	0.40 ***	0.09	4.34	358	1.48
Effortful Control	0.08	0.08	1.05	1538	1.08
Assertiveness	0.08	0.10	0.84	50	1.08

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$
N.B. *p*-values have been corrected for multiple testing using the Holm-Bonferroni method. Age and gender were included as covariates.

Table 5.5 *Multinomial logistic regression for downward mobility. Reference group is compared to both social destination group and social origin group.*

Downward Mobility	Estimate	SE	Wald z-value	df	OR
Reference group: High/Low					
High/High					
Intercept	-0.57	3.93	-0.15	82	0.56
Intelligence	1.15 ***	0.21	5.51	766	3.17
Effortful Control	0.64 †	0.22	2.96	52	1.90
Assertiveness	0.67 **	0.20	3.34	169	1.95
Low/Low					
Intercept	-0.87	4.19	-0.21	50	0.42
Intelligence	-0.77 ***	0.21	-3.64	1070	0.46
Effortful Control	0.03	0.24	0.11	26	1.03
Assertiveness	-0.02	0.21	-0.11	82	0.98
Reference group: High/Middle					
High/High					
Intercept	-1.60	1.69	-0.95	341	0.20
Intelligence	0.58 ***	0.10	5.79	886	1.78
Effortful Control	0.36 ***	0.09	3.87	149	1.44
Assertiveness	0.13	0.13	1.04	16	1.14
Middle/Middle					
Intercept	3.25	1.79	1.81	381	25.69
Intelligence	-0.36 ***	0.10	-3.41	525	0.70
Effortful Control	0.01	0.10	0.11	132	1.01
Assertiveness	-0.15	0.10	-1.47	97	0.86
Reference group: Middle/Low					
Middle/Middle					
Intercept	3.40	2.46	1.38	382	30.08
Intelligence	0.43 **	0.16	2.73	57	1.54
Effortful Control	0.21	0.12	1.70	1127	1.24
Assertiveness	0.37	0.17	2.12	16	1.45
Low/Low					
Intercept	-1.73	2.87	-0.60	51	0.18
Intelligence	-0.55 **	0.17	-3.34	56	0.58
Effortful Control	-0.05	0.15	-0.33	61	0.95
Assertiveness	-0.04	0.16	-0.24	33	0.96

$*p < 0.05$; $**p < 0.01$; $***p < 0.001$; $†p = 0.05$
N.B. *p*-values have been corrected for multiple testing using the Holm-Bonferroni method. Age and gender were included as covariates.

Post-hoc group comparisons

After model selection, final models were tested using post-hoc group comparisons to identify specific associations of intelligence, effortful control and assertiveness with upward mobility (Table 5.4) and downward mobility (Table 5.5). Intelligence was consistently associated with both upward mobility and downward mobility. Adolescents who experienced upward mobility by age 26 (e.g., Low/High) had higher intelligence at age 11 than peers in their origin group (Low/Low), but lower intelligence than peers in their destination group (High/High) in 5 out of 6 comparisons. Similarly, adolescents who experienced downward mobility (e.g., High/Low) had lower intelligence at age 11 than peers from their origin group (High/High), but higher intelligence than peers in their destination group (Low/Low) in 6 out of 6 comparisons. Thus, intelligence facilitates social mobility regardless of socioeconomic background, in line with the meritocracy hypothesis and contradicting the glass ceiling/glass floor hypothesis.

Effortful control was more often associated with upward mobility than with downward mobility. Adolescents who experienced upward mobility by age 26 (e.g., Middle/High) had more effortful control at age 11 than peers in their origin group, and similar effortful control as peers in their destination group (High/High) in 5 out of 6 comparisons. These findings are in line with the meritocracy hypothesis, and not in line with the glass ceiling/glass floor hypotheses In contrast, adolescents who experienced downward mobility by age 26 (e.g., Middle/Low) mostly had a similar level of effortful control as peers in both their origin group (Middle/Middle) and their destination group (Low/Low) in 5 out of 6 comparisons. These findings support neither the meritocracy hypothesis or the glass ceiling/glass floor hypothesis.

Just like peer competence, assertiveness was mostly not associated with upward or downward mobility. Adolescents who experienced upward mobility by age 26 (e.g., Low/High) had a similar level of assertiveness as peers in their origin group (Low/Low) and peers in their destination group (High/High) in 5 out of 6 comparisons. Adolescents who experienced downward mobility (e.g., High/Low) also had similar assertiveness at age 11 as peers in their origin group (High/High) and peers in their destination group (Low/Low) in 5 out of 6 comparisons. Hence, assertiveness – like peer competence – does not offer support for the meritocracy or the glass ceiling/floor hypothesis.

DISCUSSION

Our findings support the meritocracy hypothesis over the glass floor/glass ceiling hypothesis indicating that adolescent competencies are more important than socioeconomic background for experiencing social mobility. Adolescents with higher levels of intelligence and effortful control than peers with a similar parental SES (i.e., origin group) were more likely to experience upward social mobility, despite lower levels of intelligence and effortful control than peers with a similar young adulthood SES (i.e., destination group). Social competence – in terms of peer competence and assertiveness – were mostly not related to upward mobility. Adolescents with lower levels of intelligence than peers from their origin group were more likely to experience downward mobility, despite higher levels of intelligence than peers from their destination group. Effortful control and social competence were mostly not related to downward mobility.

Theoretical Implications

Our findings imply that adolescents with high levels of intelligence and effortful control are more likely to succeed in higher education, also when they grew up in lower SES families. Adolescents with a lower parental SES who display a similar level of intelligence and effortful control as adolescents with a higher parental SES end up in a similar young adulthood SES. This suggests that our educational system is sufficiently meritocratic to identify and stratify adolescents from different socioeconomic background into appropriate levels that match their competencies. It also suggests that risk factors associated with a lower parental SES, such as limited resources, tensions at home, and poorer educational quality or expectations, have a limited or negligible impact on adolescents opportunities to attain a higher young adulthood SES.

However, our findings that assertiveness and peer competence at age 11 are unrelated to social mobility in young adulthood contradict previous research that underlines the importance of adolescent social competence for educational and occupational success (González Fragoso et al., 2018; Woods & Sofat, 2013). Potentially, social competence may promote upward mobility *after* young adulthood. For example, more assertive adults may be able to negotiate a higher salary and adults who maintain professional relationships with colleagues may be more likely to obtain a management position. As such, we encourage future research to investigate the role of social competence in other contexts relevant for social mobility.

While these findings mostly support the meritocracy hypothesis over the glass ceiling/glass floor hypothesis, social mobility in our sample did not progress entirely in line with the meritocracy hypothesis. According to meritocratic principles, adolescents with the same competencies (e.g., level of intelligence and effortful control) end up in

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the same educational level. On the one hand, our findings support such a scenario: for example, adolescents with a low SES but a higher level of intelligence than their peers with a low SES are more likely to attain a higher educational level. On the other hand, however, our findings seem somewhat unmeritocratic: for example, adolescents with a low SES who attain university education had a lower level of intelligence than peers from their destination group (i.e., adolescents with a high parental SES who attained university). Similarly, adolescents with a high SES who attained practical vocational education had a higher level of intelligence than peer from their destination group (i.e., adolescents with a middle parental SES who attained practical vocational education). It thus seems that despite differences in intelligence, some adolescents with a low SES and some adolescents with a high SES end up in the same educational level. This finding suggests the opposite of previous research that suggests that adolescents with a lower parental SES are less likely to be enrolled in (pre-) university than adolescents with a higher parental SES, despite similar competence levels (Zumbuehl et al., 2022).Potentially, teachers interpret adolescents' level of competence in the context of their socioeconomic background (Auwarter & Aruguete, 2008).

Three observations may explain why these findings could still indicate a meritocracy. First, deviating levels of competence relative to peers in the destination group do not indicate underqualification or overqualification for an educational level. For example, adolescents with a low SES and a lower level of intelligence than peers in university nonetheless meet all official requirements for entry into higher education, and as our data shows, to successfully complete this education. Second, the average intelligence among adolescents with a high SES who attain university education (i.e., High/High) may be inflated by a number of extreme outliers from a few intellectually gifted adolescents. The same argument applies to the average intelligence among adolescents with a low SES who attain practical vocational education. As such, intelligence levels of adolescents who experienced social mobility may be similar to the modal or median intelligence level of peers in their destination group. And third, intelligence (at age 11) and educational attainment (at age 26) were measured 15 years apart. The initial gap in intelligence between socially mobile and socially stable adolescents could have easily been closed in the meantime, for example through peer and teacher association, or higher educational expectations and academic self-confidence (Mortimer et al., 2017). We therefore conclude that our findings are more likely to support the meritocracy hypothesis than the glass ceiling/glass floor hypothesis.

Strengths and Limitations

Our study is characterized by a number of strengths and limitations. Strengths include the large sample size, the elaborate measure of social mobility, simultaneous testing of multiple early adolescent characteristics, and extensive analyses and robustness checks (all pre-registered). However, a number of limitations must be taken into account when interpreting our findings.
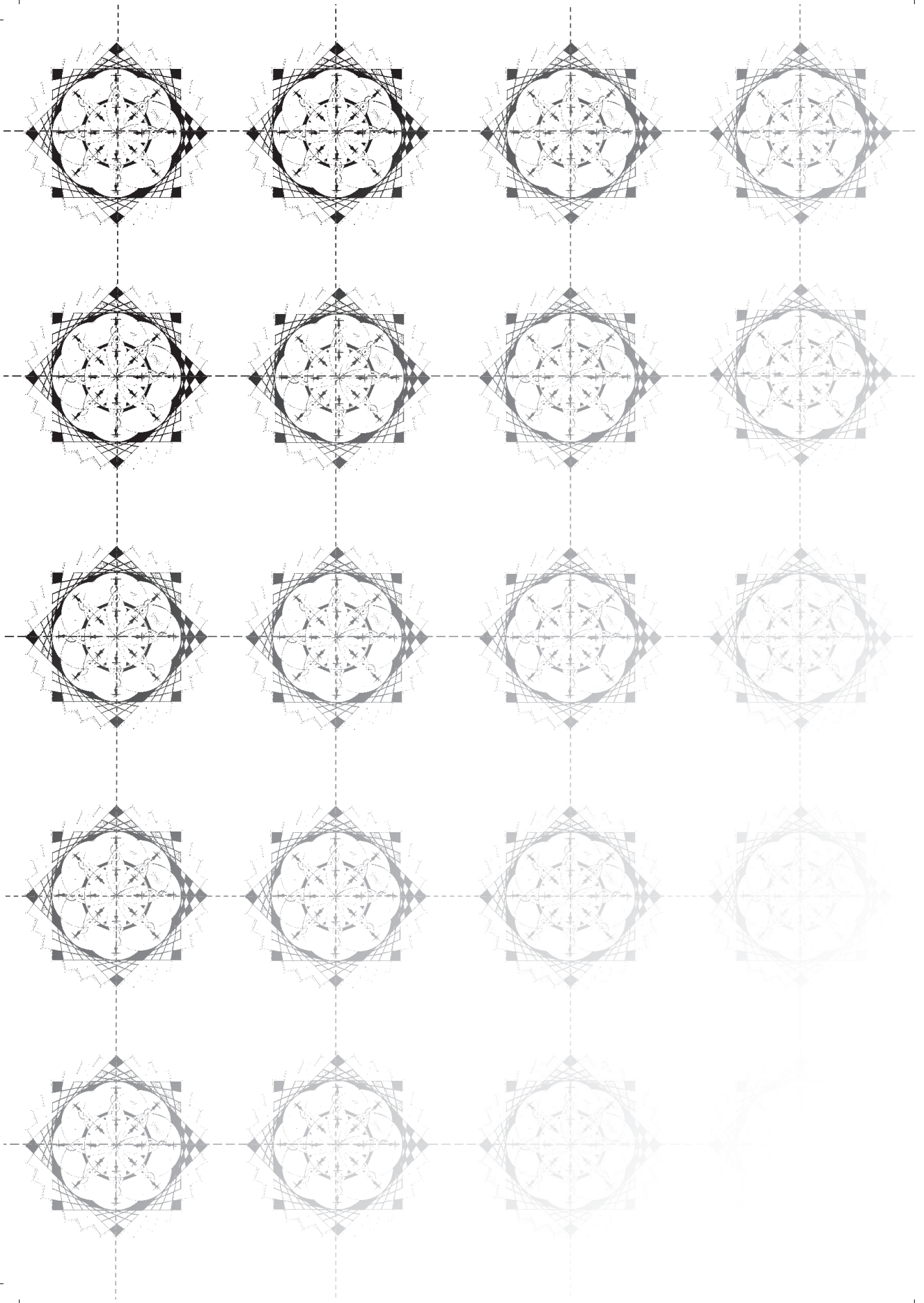
First, growing up in low SES circumstances may result in test scores that underestimate adolescents' potential. For example, adolescents from a low SES background are more likely to have received lower quality education and training, less tutoring, or even miss out on breakfast before school (Conger & Donnellan, 2007; Zumbuehl et al., 2022). If under such circumstances, adolescents from a low SES background obtain average scores on standardized tests, this may be indicative of 'untapped educational potential' – in contrast to average scores of adolescents from a high SES background. Furthermore, in circumstances characterized by scarcity and unpredictability, displaying more impulsiveness instead of more effortful control may be more adaptive (Ellis et al., 2017) – and thus indicate more competence in a specific low SES context. Future studies may opt to broaden their measure of effortful control by taking into account different (socioeconomic) circumstances that may require different expressions of behavioral control.

Second, our tertile split categorization of parental SES may deviate from the SES ratio in the population. Due to difficulties to include and retain participants from the lower socioeconomic strata (Fakkel et al., 2020), the lower SES group may represent a relatively higher subgroup of the low strata. However, considering that 1) we used 5 indicators to estimate parental SES, and that these 5 indicators tend to be positively correlated in the population; 2) our percentages of social reproduction and social mobility are in line with previous studies (e.g., OECD, 2018); and 3) alternative measures of parental SES, such as highest educated parent, may have similar shortcomings, we believe that our overall findings are likely to reflect the situation in the population.

Third, upward mobility was more common than downward mobility in our sample which is in line with previous research (e.g., OECD, 2018). This may, however, also in part be the result of incorporating educational attainment in young adulthood into our measure of social mobility. Though educational attainment in young adulthood is a strong stable indicator of later adulthood SES (Erola et al., 2016), there is an important limitation to this measure of social mobility. In most cases, higher education is available to all adolescents who meet the entry requirements (e.g., 45.0% of TRAILS participants attained higher education). On the labor market, however, high-status, high-paid jobs are limited, and many higher educated young adults may thus not end up in such jobs. Therefore, using educational attainment as measure of young adulthood SES may overestimate the rate of true social mobility in the population.

CONCLUSION

Our findings indicate that social mobility happens to a considerable extent, and is driven by competencies more than by socioeconomic background. However, the importance of intelligence and effortful control for social mobility may in itself be somewhat unmeritocratic in nature, because both are 1) genetically determined to a considerable extent (Willems et al., 2020); and 2) better developed under high SES circumstances than low SES circumstances (Cunha & Heckman, 2007). Furthermore, alternative competencies related to creativity, problem solving, or interpersonal service may be somewhat overlooked in our educational system – despite strong demand on the labor market (Suarta et al., 2017). As a result, adolescents with such alternative competencies may feel stigmatized or unworthy from a very young age onwards. Hence, while it could be argued that our current educational system is as meritocratic as it intends to be, we also argue for a broader appreciation of competencies which would better reflect the sociocultural diversity among adolescents as well as the diversity in employer demands (Sandel, 2021).

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CHAPTER 6

TESTING SAMPLING BIAS IN ESTIMATES OF ADOLESCENT SOCIAL COMPETENCE AND BEHAVIORAL CONTROL

ABSTRACT

In 5 of the 6 large Dutch developmental cohorts investigated here, lower SES adolescents are underrepresented and higher SES adolescents overrepresented. With former studies clearly revealing differences between SES strata in adolescent social competence and behavioral control, this misrepresentation may contribute to an overestimation of normative adolescent competence. Using a raking procedure, we used national census statistics to weigh the cohorts to be more representative of the Dutch population. Contrary to our expectations, in all cohorts, little to no differences between SES strata were found in the two outcomes. Accordingly, no differences between weighted and unweighted mean scores were observed across all cohorts. Furthermore, no clear change in correlations between social competence and behavioral control was found. These findings are most probably explained by the fact that measures of SES in the samples were quite limited, and the low SES participants in the cohorts could not be considered as representative of the low SES groups in the general population. Developmental outcomes associated with SES may be affected by a raking procedure in other cohorts that have a sufficient number and sufficient variation of low SES adolescents.

Keywords: socioeconomic status (SES), adolescence, social competence, behavioral control, selection bias

INTRODUCTION

Although cohort studies generally aim at selecting a sample that is representative for the whole population, vulnerable groups in our society are less often part of these cohort studies (Jang & Vorderstrasse, 2019; Svensson et al., 2012; Walter et al., 2013). Since participants from a lower socioeconomic background tend to be less inclined to participate in research, this can result in a sampling bias of participants with a higher socioeconomic status (SES; Bornstein, Jager, & Putnick, 2013; LeWinn, Sheridan, Keyes, Hamilton, & McLaughlin, 2017). An important question that follows is whether findings from such samples reflect the psychosocial development of the whole population or of a subsample of our society (Arnett, 2008; Boudewijns et al., 2019; Henrich et al., 2010; LeWinn et al., 2017). One way to answer this question is to estimate to what extent the unweighted results of such samples diverge from the results when samples are weighed with respect to SES. In the current study, we investigate whether estimates of social competence and behavioral control in adolescents from 6 Dutch developmental cohorts differs between the unweighted samples and their weighted samples that are more socioeconomically representative of the general Dutch population.

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SES, Social Competence and Behavioral Control

Several studies underline the positive association between family SES and an adolescent's social competence (e.g., de Laat et al., 2016; Hosokawa & Katsura, 2017) and behavioral control (e.g., Bradley & Corwyn, 2002; Farley & Kim-Spoon, 2017). A family's SES reflects the relative position of the household in the wealth distribution of a given society (De Neubourg et al., 2018). While no single definition of SES is universally accepted, it is generally measured through a combination of family income, parental education, and parental occupation (Krieger et al., 1997; Oakes & Rossi, 2003) to approximate an individual's resources, prestige, knowledge and power (Link-Gelles et al., 2016). Given that SES indicators may differ in stability across time and in predicting adolescent development (Duncan & Magnuson, 2003), SES is preferably estimated using multiple indicators instead of a single indicator (Green & Popham, 2019; Thaning & Hällsten, 2020). Social competence refers to an individual's ability to engage in meaningful interactions with peers and adults (Fabes et al., 2006; Rose-Krasnor, 1997). Behavioral control refers to the ability to control one's behaviors, cognitions, and emotions and to adapt to rules. It is often termed as self-regulation, effortful control, or self-control in the literature (Nigg, 2017; Zhou et al., 2012).

The interactionist model (Conger & Donnellan, 2007; Martin et al., 2010) postulates that high family SES positively impacts psychosocial development in children and adolescents. Economic hardships – often accompanying low SES families – cause

prolonged stress in parents which interferes with effective child rearing practices (i.e., *family stress model*); while material resources – more easily invested by high SES families – can stimulate psychosocial development (i.e., *family investment model*). Though distinct characteristics, social competence and behavioral control tend to develop interactively (Cunha & Heckman, 2007), with more socially competent adolescents generally also displaying better behavioral control, and vice versa. For example, adolescents with better self-regulatory capacities are less likely to engage in transgressive behaviors and more likely to engage in prosocial behaviors towards others (Farley & Kim-Spoon, 2014; Meldrum & Hay, 2012).

SES and Research Participation

In developmental cohort studies, low SES participants may be undersampled or underrepresented. Low SES participants are undersampled if the proportion of low SES participants in the sample is smaller than the proportion high SES participants in the sample. Low SES participants are underrepresented if the proportion of low SES participants in the sample is smaller than the proportion low SES participants in the target population (see Skiba et al., 2008). Though in both cases the sample has too few participants from a low SES background, undersampling and underrepresentation yield different research challenges.

 Undersampling of low SES participants has a direct, negative impact on a study's power to detect effect sizes (Bornstein et al., 2013; Button et al., 2013). The absolute number of low SES participants would limit the range and complexity of research questions in which developmental differences across socioeconomic strata can be investigated (given that higher SES participants are more likely to participate). Underrepresentation of low SES participants is problematic for understanding normative psychosocial development in a given target population (Brady et al., 2018; LeWinn et al., 2017). A fundamental goal of developmental research is to distinguish universal aspects of development from variable aspects of development, caused by – for example – socioeconomic status (Brady et al., 2018). This requires studying a representative sample of the population. Cohort studies have substantially contributed to our understanding of adolescent's psychosocial development, even though they encounter many challenges at the stages of participant recruitment. However, as a result of the common underrepresentation of low SES adolescents in cohort studies, normative psychosocial development may be overestimated when extrapolating research findings to the general population. The usual way to correct for these biases is by weighing the sample data to the population on variables for which the population distribution is known.

This challenge of selection bias is increasingly being recognized in other, related fields of research (e.g., Falk et al., 2013; Paus, 2010). For example, after a predominantly

high SES child and adolescent cohort was weighted to national SES statistics, an attenuation in normative neurological growth was observed (LeWinn et al., 2017). Given the strong association between brain development and psychosocial development, normative social competence and behavioral control may similarly be overestimated in adolescents if we rely primarily on high SES samples. In related genetics research, population heritability estimates of for example cognitive ability (Gottschling et al., 2019; Turkheimer et al., 2003) were attenuated after heritability estimates were found to be lower in samples of low SES children and adolescents compared to previously studied high SES samples. In recent years, participation rates in community research have been dropping steeply (Galea & Tracy, 2007; Nohr & Liew, 2018), especially among more vulnerable groups resulting in an even stronger reliance on predominantly higher SES research samples. However, it must also be noted that some normative estimates of development which are based on high SES samples are similar to estimates in the socioeconomically diverse population (see for example Pizzi et al., 2012). Though these examples are seemingly unrelated to adolescent social competence and behavioral control, it suggests that a similar attenuation of normative estimates may be observed when weighing our developmental cohorts to population SES statistics.

We aim to extend the existing progress in this field by investigating the possible influence of an underrepresentation of low SES adolescents on normative social competence and behavioral control. All 6 Dutch developmental cohorts studied here are part of the Consortium on Individual Development (CID). CID aims to examine how environmental (e.g., SES) and individual (e.g., genetic makeup) characteristics influence the development of social competence and behavioral control; skills that are essential for functioning in society and reducing risk of behavioral and emotional problems.

First, the cohorts were evaluated for socioeconomic representativeness; second, we assessed the impact of SES on social competence and behavioral control, and the effect of deviations in representativeness on estimates of adolescent social competence and behavioral control. By comparing weighted estimates of adolescent social competence and behavioral control to unweighted estimates, our aim was to quantify the effect of a possible sampling bias on normative adolescent psychosocial competence. Additionally, we explored the effect of sample weighing on the association between adolescent social competence and behavioral control.

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METHODS

Participants

Participants of 6 large cohort studies from The Netherlands were investigated: Generation R (GenR), Leiden Consortium on Individual Development (L-CID), Research on Adolescent Development And Relationships (RADAR), the Netherlands Twin Register (NTR), Tracking Adolescents' Individual Lives Survey (TRAILS), and YOUth (Youth of Utrecht) (Table I). *Generation R* is a birth cohort study from the Rotterdam municipality, an urban region in the west of the Netherlands (Kooijman et al., 2016). Measurements relevant for this study were collected from 9-12-year-old children, who have been participants since before birth. *L-CID* is a longitudinal experimental twin-study, which aims to study the effect of a video-intervention on parental sensitivity and sensitive discipline in two twin cohorts (early childhood and middle childhood) (Crone et al., 2019; Euser et al., 2016). Families with same sex twins were recruited from the western region of the Netherlands. The L-CID participants in our study were 9-10-year-old children of age from the middle childhood cohort, who had been allocated to the control group and did not receive an intervention. *NTR* is a longitudinal twin study that aims to identify genetic and environmental factors of behavioral and emotional problems in children and adolescents (Bartels et al., 2007). Participants are recruited across the entire country, and research assessments are attuned to individual age. For the current study, data collected between 2003 and 2017 of 10-year-olds was analyzed. Though earlier data is available in NTR (i.e., since 1987), high quality national census statistics were scarce before 2003. Also, this time period restriction matches well with the time periods of the other cohorts in this study. *RADAR* is a longitudinal cohort study that investigates interactions and conflicts of adolescents with parents and peers, emotional development, identity, and internalizing and externalizing problem behavior (Van Lier et al., 2008). Participants have been recruited through elementary schools in the Utrecht municipality (i.e., mid-Netherlands) and 4 large cities elsewhere. Baseline measurements were used in this study, at which adolescents were around age 13. *TRAILS* is a general population cohort study that aims to understand (the interaction between) determinants of mental health and social development during adolescence and young adulthood (Huisman et al., 2008; Oldehinkel et al., 2015). Participants are recruited from urban and rural areas in the northern region of the Netherlands. Baseline measurements were used in this study, at which adolescents were approximately age 13-14. *YOUth* is a longitudinal cohort study following two separate groups of participants from the Utrecht region (i.e., mid-Netherlands) either in their development from pregnancy into childhood or from childhood into adolescence (in this special issue: Onland-Moret, Kemner, & Hulshoff Pol, 2020 (under submission)). The 9-year old children whose data were analyzed for this

study were recruited through elementary schools, municipal health services, and local neighborhood centers.

We aimed to align the mean ages between cohorts, ranging from late childhood to early adolescence (9.5 – 13.5 years old). Participants from all cohorts were predominantly of Dutch or Western European origin (see Table 6.1). Multiple siblings participated in Generation R, NTR, RADAR, and L-CID. For Generation R and NTR, one adolescent per family was randomly selected to be retained for analyses. In RADAR, the targeted adolescent and not the consulted sibling was retained per family for analyses. In L-CID, the adolescent who had been randomly allocated to the control group and did not receive an intervention was retained for analyses.

Besides cohort specific inclusion and exclusion criteria, our analytical approach required participants to i) have observations on all SES variables used for weighing, and ii) have at least one observed score, for social competence or behavioral control.

Measures

All cohorts have collected data on adolescents' SES, social competence and behavioral control. Although none of the measuring instruments has been administered consistently across all cohorts, considerable overlap can be observed. Measures of social competence and behavioral control were selected to facilitate cross-validation across cohorts and age ranges (i.e., assessing the same measurement instrument in multiple cohorts when possible; see also Table 6.7).

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Table 6.1 *Demographics of participants from the 6 cohorts*

Cohort	Wave	*n*	Age *(SD)*	Female	Dutch [a]
GenR	T4	3895	9.7 (0.28)	50.1%	76.5%
L-CID	T3	142	9.5 (0.64)	52.8%	100.0%*
NTR	T5	6266	9.9 (0.54)	50.7%	94.5%
RADAR	T1	441	13.0 (0.44)	44.2%	93.3%*
TRAILS	T2	1535	13.5 (0.52)	50.4%	89.8%
YOUth	T1	595	9.5 (0.87)	54.5%	95.6%

[a] or Western European origin
*Dutch or Western European mother and father as inclusion criterion

Socioeconomic status

SES was measured with mother's educational attainment, father's educational attainment, and family income. Highest level of educational attainment of both mother and father was identified in all six cohorts. For our analyses, three ordinal levels of educational attainment were constructed in the cohorts and the census: lower education, middle education, and higher education. Lower education includes for example primary school as highest attained level of education; middle education includes for example tertiary vocational education; and higher education includes for example university education (see Appendix A for more detail about the Dutch education system and our classification approach).

Family income has been collected in Generation R, TRAILS, and YOUth; but not in L-CID, RADAR, and NTR. In Generation R and TRAILS, net family income per month was obtained from the primary participating parent. In YOUth, gross family income per month was obtained from both parents. In case of discrepancy (*n* = 145; 17.3%), the answer of the primary participating parent was leading. For these cohorts, income categories were matched to income deciles from the national census (for full procedure, see Appendix B). Across cohorts, Pearson's correlations of mother's education and father's education ranged between *r* = 0.31 to *r* = 0.54, of mother's education and income between *r* = 0.24 to *r* = 0.44, and of father's education and income between *r* = 0.29 to *r* = 0.52 (see Appendix C).

Per cohort, we used the census distributions of observed SES variables (Appendix D) corresponding to the starting year of data collection of men and women between age 35 and 55 (Tables 6.2-6.5, 6.8, 6.9). For NTR, in which inclusion is ongoing and data collection waves are individually based on participant's age, census statistics between 2003 and 2017 were averaged to indicate Dutch population SES.

Social competence

Social competence was operationalized in terms of social problems or prosocial behavior. In GenR, NTR, and TRAILS, parents reported on their adolescent's social problems using the Social Problems-subscale from the Child Behavior Checklist (CBCL-SP; Achenbach, 1991; Achenbach & Rescorla, 2001). The CBCL-SP consists of 11 items (e.g., "Doesn't get along with other boys and girls") which either mother or father rated as 0 (Not true), 1 (Somewhat or sometimes true), or 2 (Very true or often true). After recoding, higher scores on the CBCL-SP indicate better social competence. With Cronbach's alpha coefficients ranging from 0.72 to 0.76 across cohorts, the internal consistency of the CBCL-SP is adequate.

In L-CID and YOUth, prosocial behavior was measured with the Prosocial Behavior-subscale from the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997; Stone et al., 2010). The SDQ-PB consists of 5 items (e.g., "Often volunteers to help others"), rated as 0 (Not true), 1 (Somewhat true), or 2 (Certainly true), by either mother or father (YOUth) or both parents combined (L-CID). Higher scores on the SDQ-PB indicate better

social competence. The internal consistency of the SDQ-PB is adequate, with a Cronbach's alpha of 0.78 in L-CID and 0.72 in YOUth.

In RADAR, adolescents rated themselves on a cohort specific Prosocial Behavior questionnaire (R-PB), consisting of 11 items (e.g., "I'm normally kind to others") on a scale from 1 (Totally not true) to 7 (Totally true). Higher scores on the R-PB indicate better social competence. For all instruments, participants' mean item scores were calculated as measure of adolescent social competence. In YOUth, both the CBCL-SP and SDQ-PB were obtained: an interscale correlation of $r = 0.29$, $n = 373$, $p < .001$ indicated low convergent validity. For YOUth, the SDQ-PB was reported as measure of social competence to enable cross-validation of the SDQ-PB across two cohorts (i.e., L-CID). The Cronbach's alpha coefficient of the R-PB is 0.89, suggesting good internal consistency.

Behavioral control

Behavioral control was operationalized in terms of self-control or drive.

In Gen-R, NTR, and YOUth, self-control was measured with the parent-reported Achenbach Self-Control Scale based on CBCL items (ASCS; Willems et al., 2018). The ASCS consists of 8 items (e.g., "Impulsive or acts without thinking") which either mother or father rated as 0 (Not true), 1 (Somewhat or sometimes true), or 2 (Very true or often true). After recoding, higher scores on the ASCS indicate better behavioral control. Across cohorts, the Cronbach's alpha coefficients range between 0.81 and 0.83, suggesting good internal consistency.

In L-CID, RADAR, and TRAILS, we proposed to measure behavioral control using the BAS-Drive subscale from the Behavioral Inhibition System/Behavioral Activation System (BIS/BAS) questionnaire (BAS-D; Carver & White, 1994). Drive refers to stronger impulsivity or stronger positive affective reactions to signals of impending reward (e.g., Jiang & Zhao, 2017; Taubitz et al., 2015), and is associated with – but not synonymous to – poorer behavioral control. The BAS-D consists of 4 items (e.g., "When I want something, I usually go all-out to get it"), which adolescents self-report on a scale from 1 (Disagree strongly) to 4 (Agree strongly). After recoding, a higher score on the BAS-D indicates better behavioral control. Across cohorts, the Cronbach's alpha coefficients range between 0.57 and 0.65, which is on the lower bound of acceptable reliability.

Following serious concerns about the validity of the BAS-D as a measure of behavioral control (e.g., poor convergent validity between the ASCS and BAS-D in TRAILS; $r = .13$, $n = 1088$, $p < .001$) but after having already completed our preregistration, we present these specific findings separately in the Supplementary Materials section (Tables 6.8 – 6.10). In TRAILS, both the ASCS and BAS-D were obtained, but only the use of BAS-D scores was preregistered. Hence, our findings in TRAILS that were based on non-preregistered ASCS data (Table 6.4) may be interpreted as exploratory.

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Raking procedure

To understand how sample composition influences our understanding of adolescent social competence and behavioral control, we contrasted the unweighted versus the weighted sample of 6 large cohort studies from the Netherlands. The unweighted sample consisted of adolescents with complete observations on SES variables, and at least one observed score on social competence or behavioral control. The weighted sample was created using a raking procedure, and is representative of the Dutch population in terms of socioeconomic status. The unweighted sample and the weighted sample consisted of the exact same participants. National census data on parental education and income was retrieved from the open data portal of Statistics Netherlands (CBS Statline; see Appendix D).

Raking is a survey method through which weights are applied to individual participants based on census totals, so that the weighted sample better reflects the population distribution of SES variables that are included in the weighing procedure (Kalton & Flores-Cervantes, 2003; Kolenikov, 2014). With raking, the distribution of the sample is fitted to population values one variable at a time. Weights are fitted iteratively across all variables used in the weighting, and then re-weighted until the weight factors do not change much and 'coverage'. After this, each participant is then assigned a final weight that will balance the sample distribution to the population distribution as well as possible for all variables in the model.

Mean differences and correlation differences

After raking, estimates of adolescent social competence and behavioral control were compared between unweighted and weighted samples. The difference in mean social competence and mean behavioral control between unweighted and weighted samples is expressed as effect size Cohen's d. Standard interpretations of Cohen's d apply, with $d = 0.2$ indicating a small effect; $d = 0.5$ a medium effect; and $d = 0.8$ a large effect of sample composition on estimates of adolescent social competence and behavioral control (Rosnow & Rosenthal, 2003).

In both the unweighted and weighted samples, we calculated the Pearson's correlation coefficient r between social competence and behavioral control. This difference score can directly be interpreted as an effect size (Rosnow & Rosenthal, 2003).

Sensitivity analyses

Per cohort, we conducted a sensitivity analysis in which outliers were deleted. Differences between excluded and included adolescents per cohort are described in Appendix F. By excluding outliers on social competence or behavioral control, we aimed to control for the possibility of an overreliance on one or few observations in determining the weighted

estimates. Scores with ≥ (±) 2.58 standard deviations from the mean were considered as outliers. After consultation, this cut-off was considered more valid for rigid sensitivity testing than our preregistered cut-off of ≥ (±) 3 standard deviations. For our two non-normally distributed outcome variables this corresponded to the exclusion of between 2.0% to 4.1% of extreme scores across cohorts. If a participant's score on either social competence or on behavioral control was an outlier, the participant was excluded from the raking procedure. Besides this preregistered sensitivity analysis, in all cohorts, we also reran our raking procedure with only 1 or 2 SES variables instead of all available SES variables.

RESULTS

Cohort representativeness

As a first step, we compared the SES distribution of the 6 cohorts to Dutch population statistics in order to obtain weights for the raking procedure (Tables 6.2-6.5, 6.8, 6.9). For each cohort, we calculated the difference (i.e., Δ = cohort proportion – population proportion; expressed in percent points) in prevalence between Dutch population and cohort participants per SES variable category. Positive percentages indicate an overrepresentation of participants from this SES variable category, and negative percentages indicate an underrepresentation of participants from this SES variable category. We also calculated the ratio (: = cohort proportion ÷ population proportion) of underrepresentation (if : < 1) or overrepresentation (if : > 1) per SES variable category in each cohort. No rule of thumb is known for assessing representativeness, but sample deviations larger than 10% from the population proportion have previously been considered as a warning sign (Chinn & Hughes, 1987 in Skiba et al., 2008). This corresponds to ratios between 0.9 and 1.1 being considered reasonable (e.g., if 30% of mothers in the population are higher educated, 27-33% of the sample should consist of higher educated mothers).

        In 5 of the 6 cohorts, low SES participants are underrepresented and high SES participants are overrepresented (Tables 6.2-6.5, 6.8, 6.9). Over these 5 cohorts, the mean Δ = -13.7% and the mean : = 0.43 for all low SES indicators. This is equivalent to if 25% of Dutch adolescents would be of low SES, and the 5 cohorts on average consist of 11% low SES adolescents. Similarly, over these 5 cohorts, the mean Δ = 23.6% and the mean : = 1.78 for all high SES indicators. In other words, if 29% of Dutch adolescents would be of high SES, these 5 cohorts would on average consist of 52% high SES adolescents. The exception is NTR, with a modest overrepresentation of low SES and high SES adolescents, and slight underrepresentation of middle SES adolescents. These deviations in socioeconomic representativeness in all cohorts form an important first prerequisite for performing the raking procedure.

 As expected, *F*-tests indicated differences in social competence and behavioral control between adolescents from different SES variable categories in Generation R (Table 6.2), NTR (Table 6.3) and TRAILS (Table 6.4). Post-hoc analyses indicated that in most of these cases, adolescents with lower educated parents from lower income families scored lower on social competence or behavioral control than adolescents with higher educated parents from higher income families; but not consistently, with adolescents from the middle categories at times scoring higher than high SES adolescents or lower than low SES adolescents. Also, differences in social competences or behavioral control were not observed consistently across all SES indicators. Contrary to our expectations, no differences in social competence and behavioral control were observed between adolescents from different SES variable categories in YOUth (Table 6.5), L-CID (Table 6.8, see Supplementary Material), and RADAR (Table 6.9, see Supplementary Material). Hence, the observed differences in social competence and behavioral control between some SES variable categories in some cohorts fulfilled a second important prerequisite for performing the raking procedure.

 Adolescents that are in the lower category on a particular SES indicator (e.g., mother's education) are not necessarily also in the lower category on another SES indicator (e.g., income). Across all cohorts, the proportion adolescents that is considered to have a low SES background drops sharply if low SES is redefined from being in the lowest category for at least one SES indicator (e.g., having a lower educated mother *or* lower educated father) to being in the lowest category for all SES indicators (e.g., having a lower educated mother *and* lower educated father; see Table 6.6). Census statistics of the Dutch population have been obtained from different groups of citizens per SES indicator, and are therefore not combined in Table 6.6.

Table 6.2 *Generation R versus Dutch population (2008/2012)¹. Mean item scores (SD) and Pearson's correlations (r) on social competence and behavioral control per SES variable category in unweighted sample.*

	Dutch population	GenR	Δ	:	Social competence [2]	Behavioral control [3]	r
Mother education (%)							
Lower education	34.4	1.4	-33.0	0.04	1.78 (0.21)[a]	1.65 (0.41)[b]	0.65
Middle education	40.7	32.9	-7.8	0.81	1.84 (0.20)[a]	1.62 (0.36)[a]	0.61
Higher education	24.9	65.7	40.8	2.64	1.86 (0.19)[b]	1.66 (0.35)[b]	0.58
Father education (%)							
Lower education	26.8	3.9	-22.9	0.15	1.83 (0.22)[a]	1.65 (0.37)[b]	0.75
Middle education	41.1	33.8	-7.3	0.82	1.83 (0.21)[a]	1.60 (0.37)[a]	0.62
Higher education	32.1	62.2	30.1	1.94	1.86 (0.18)[b]	1.67 (0.34)[b]	0.56
Net family income (%)							
< €1.200	14.5	4.0	-10.5	0.28	1.78 (0.24)[a]	1.60 (0.39)[a]	0.72
€1.200 – 2.000	24.0	10.4	-13.6	0.43	1.83 (0.23)[ab]	1.58 (0.40)[a]	0.65
€2.000 – 3.200	29.0	14.9	-14.1	0.51	1.83 (0.20)[ab]	1.62 (0.37)[a]	0.62
€3.200 – 4.000	13.0	19.4	6.4	1.49	1.85 (0.18)[b]	1.63 (0.36)[a]	0.52
> €4.000	19.5	51.4	31.9	2.64	1.87 (0.18)[c]	1.68 (0.33)[b]	0.57

Parameters with different superscripts differ significantly from each other at the *p* < .05 level.

[1] Educational attainment from 2008 census; Family income from 2012 census.

Δ = difference in percent points between GenR and Dutch population = GenR – Dutch population.

: = ratio of GenR to Dutch population = GenR ÷ Dutch population.

[2] CBCL–SP; [3] ASCS

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Table 6.3 *NTR versus Dutch population (2003-2017). Mean item scores (SD) and Pearson's correlations (r) of social competence and behavioral control per SES variable category in unweighted sample.*

	Dutch population	NTR	Δ	:	Social competence [1]	Behavioral control [2]	r
Mother education (%)							
Lower education	26.7	30.8	4.1	1.15	1.82 (0.21)[a]	1.56 (0.38)[a]	0.65
Middle education	44.3	35.0	-9.3	0.79	1.83 (0.20)[a]	1.61 (0.35)[b]	0.63
Higher education	29.0	34.2	5.2	1.18	1.85 (0.18)[b]	1.67 (0.32)[c]	0.61
Father education (%)							
Lower education	23.6	31.8	8.2	1.35	1.82 (0.21)[a]	1.57 (0.38)[a]	0.65
Middle education	42.7	30.8	-11.9	0.72	1.83 (0.20)[a]	1.61 (0.35)[b]	0.63
Higher education	33.7	37.4	3.7	1.11	1.85 (0.19)[b]	1.66 (0.32)[c]	0.62

Parameters with different superscripts differ significantly from each other at the $p < .05$ level.

Δ = difference in percent points between NTR and Dutch population = NTR − Dutch population.

: = ratio of NTR to Dutch population = NTR ÷ Dutch population.

[1] CBCL-SP; [2] ASCS

Table 6.4 *TRAILS versus Dutch population (2001/2003)[1]. Mean item scores (SD) and Pearson's correlations (r) on social competence and behavioral control per SES variable category in unweighted sample.*

	Dutch population	TRAILS	Δ	:	Social competence [2]	Behavioral control [3]	r
Mother education (%)							
Lower education	37.2	34.1	-3.1	0.92	1.82 (0.22)[a]	1.52 (0.39)[a]	0.55
Middle education	40.3	36.2	-4.1	0.90	1.83 (0.23)[ab]	1.55 (0.38)[a]	0.58
Higher education	22.5	29.8	7.3	1.32	1.86 (0.18)[b]	1.62 (0.36)[b]	0.48
Father education (%)							
Lower education	29.3	30.8	-1.5	1.05	1.83 (0.20)[ab]	1.52 (0.39)[a]	0.59
Middle education	41.2	32.2	-9.0	0.78	1.82 (0.24)[a]	1.52 (0.40)[a]	0.52
Higher education	29.4	36.9	7.5	1.26	1.86 (0.19)[b]	1.63 (0.34)[b]	0.53
Net family income (%)							
< €1.135	22.2	7.0	-15.2	0.32	1.80 (0.23)[ab]	1.52 (0.39)[ab]	0.65
€1.135 – €1.590	15.7	16.9	1.2	1.08	1.79 (0.24)[a]	1.52 (0.37)[a]	0.46
€1.590 – €2.045	19.0	23.7	4.7	1.25	1.84 (0.20)[ab]	1.54 (0.36)[ab]	0.58
€2.045 – €2.955	23.2	35.1	11.9	1.51	1.84 (0.22)[b]	1.58 (0.40)[ab]	0.57
> €2.955	19.9	17.3	-2.6	0.87	1.88 (0.19)[b]	1.62 (0.35)[b]	0.49

Parameters with different superscripts differ significantly from each other at the *p* < .05 level.

[1] Family income from 2001 census; Educational attainment from 2003 census

Δ = difference in percent points between TRAILS and Dutch population = TRAILS – Dutch population.

: = ratio of TRAILS to Dutch population = TRAILS ÷ Dutch population.

[2] CBCL-SP; [3] ASCS

Table 6.5 *YOUth versus Dutch population (2015). Mean item scores (SD) and Pearson's correlations (r) on social competence and behavioral control per SES variable category in unweighted sample.*

	Dutch population	YOUth	Δ	:	Social competence [1]	Behavioral control [2]	r
Mother education (%)							
Lower education	22.3	3.0	-19.3	0.13	1.68 (0.37)	1.47 (0.30)	0.19
Middle education	43.4	22.0	-21.4	0.51	1.74 (0.34)	1.45 (0.42)	0.14
Higher education	34.3	75.0	40.7	2.19	1.69 (0.34)	1.53 (0.39)	0.32
Father education (%)							
Lower education	22.0	7.1	-14.9	0.32	1.75 (0.31)	1.45 (0.35)	0.21
Middle education	42.2	24.0	-18.2	0.57	1.71 (0.33)	1.52 (0.39)	0.26
Higher education	35.8	68.9	33.1	1.92	1.70 (0.35)	1.51 (0.40)	0.28
Net family income (%)							
< €1.250	9.0	1.5	-7.5	0.17	1.75 (0.49)	1.39 (0.29)	0.24
€1.250 – €2.000	13.8	4.0	-9.8	0.29	1.65 (0.39)	1.62 (0.32)	0.07
€2.000 – €3.000	16.6	6.4	-10.3	0.38	1.73 (0.28)	1.40 (0.47)	0.38
€3.000 – €4.000	13.0	15.8	2.9	1.22	1.65 (0.35)	1.42 (0.42)	0.34
> €4.000	47.6	72.3	24.9	1.52	1.72 (0.34)	1.53 (0.38)	0.26

Parameters with different superscripts differ significantly from each other at the *p* < .05 level.

Δ = difference in percent points between YOUth and Dutch population = YOUth – Dutch population.

: = ratio of YOUth to Dutch population = YOUth ÷ Dutch population.

[1] SDQ-PB; [2] ASCS

Table 6.6 *Proportions low SES in each cohort differs between definitions.*

Cohort	Partial low SES [a]	Full low SES [b]
GenR	7.9%	<1%
L-CID	10.1%	<1%
NTR	38.8%	13.1%
RADAR	35.8%	12.7%
TRAILS	46.5%	4.2%
YOUth	10.3%	<1%

[a] Having a lower educated mother *and/or* father (*and/or* low income).

[b] Having a lower educated mother *and* father (*and* low income).

Weighted versus unweighted estimates

Our raking procedure yielded no considerable changes, with effect sizes ranging from -0.12 to 0.03 (Table 6.7). In other words, mean estimates of social competence and behavioral control were mostly similar between the unweighted sample and the weighted counterpart. Similarly, the correlation between social competence and behavioral control was mostly equal in the unweighted sample and weighted sample, with effect sizes ranging from -0.06 to 0.05 (Table 6.7). Due to a lack of initial differences in adolescent social competence and behavioral control between SES strata, the raking procedure yielded no change in mean scores or correlations in L-CID, RADAR, and YOUth. Despite adolescents from the lower SES categories scoring lower on social competence or behavioral control than adolescents form the higher SES categories, our raking procedure also yielded no changes in normative estimates in Generation R, NTR, and TRAILS.

Sensitivity analyses

Sensitivity analyses showed minor but non-significant deviations from the original results after removing outliers (Appendix E). Hence, our raking results are not driven by extreme scores on social competence or behavioral control.

In addition to our preregistered sensitivity analyses, we assessed per cohort whether adolescents that were excluded from analyses due to missing data differed from the included adolescents in our final datasets (Appendix F). In most cohorts, excluded adolescents were from the lower categories on at least one SES indicator, but while in some cohorts the excluded adolescents scored lower on social competence and behavioral control (e.g., TRAILS), in other cohorts scores on social competence and behavioral control were similar between excluded and included adolescents (e.g., RADAR). It must be noted that excluded adolescents per definition had missing data, hence, comparisons to included adolescents are based on a subset of excluded adolescents (i.e., those with available data on the variable of interest).

Furthermore, we reran our raking procedure using all possible combinations of SES variables for weighing (e.g., only using mother's education; using father's education and income, etc.) and compared outcomes to our original raking analysis which included all available SES variables. Changes in effect sizes were negligible, suggesting that differences in number of observed SES variables between cohorts does not affect results.

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Table 6.7 *Mean item scores (SD), Pearson's correlations [95% CI], and effect sizes of social competence and behavioral control in unweighted versus weighted sample. 1*

	Measure	Unweighted	Weighted		Effect size
Social competence *Mean item scores (SD)*					
GenR	CBCL-SP	1.85 (0.19)	1.83 (0.20)		-0.12
L-CID	SDQ-PB	1.68 (0.27)	1.68 (0.26)		0.03
NTR	CBCL-SP	1.83 (0.20)	1.83 (0.20)		0.00
RADAR	R-PB	5.56 (0.89)	5.53 (0.90)		-0.03
TRAILS	CBCL-SP	1.84 (0.21)	1.83 (0.22)		-0.04
YOUth	SDQ-PB	1.70 (0.35)	1.67 (0.40)		-0.10
Behavioral control *Mean item scores (SD)*					
GenR	ASCS	1.65 (0.35)	1.65 (0.36)		0.02
L-CID	BAS-D	1.58 (0.62)	1.55 (0.61)		-0.04
NTR	ASCS	1.62 (0.36)	1.61 (0.35)		-0.01
RADAR	BAS-D	0.87 (0.49)	0.87 (0.50)		0.00
TRAILS	ASCS	1.26 (0.59)	1.25 (0.59)		-0.01
YOUth	ASCS	1.50 (0.39)	1.46 (0.39)		-0.11
Correlation *Social competence, Behavioral control*					
GenR	CBCL-SP, ASCS	0.59	[0.57, 0.61]***	0.64	0.05
L-CID	SDQ-PB, BAS-D	0.11	[-0.07, 0.28]	0.05	-0.06
NTR	CBCL-SP, ASCS	0.63	[0.62, 0.65]**	0.63	0.00
RADAR	R-PB, BAS-D	-0.19	[-0.10, -0.28]**	-0.18	0.01
TRAILS	CBCL-SP, ASCS	0.55	[0.51, 0.58]**	0.56	0.01
YOUth	SDQ-PB, ASCS	0.27	[0.18, 0.35]***	0.25	-0.02

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

DISCUSSION

Despite the fact that in 5 of 6 Dutch cohorts participants from lower SES were severely underrepresented and in 3 of the 6 cohorts differences in social competence and behavioral control were observed between SES variable categories, weighting the scores for SES did not produce different normative estimates. In one cohort (i.e., NTR), lower and higher SES adolescents were relatively well-represented, and while differing in social competence and behavioral control, the small sample weights that were applied yielded no difference in normative estimates. Contrary to our expectations, these findings suggest that normative adolescent social competence and behavioral control is not overestimated as a result of predominantly high SES adolescents in Dutch developmental research cohorts.

By testing our research question in 6 different developmental cohorts; with various measures of SES, social competence and behavioral control; on various test statistics; across a broad age range of late childhood and adolescence; and verified through several sensitivity analyses, our findings can be considered robust. However, a number of factors need to be taken into account.

First, it can be questioned how representative the low SES participants in the cohorts are for the low SES population. In the YOUth cohort, for example, only one family was analyzed that is considered 'low SES' on all categories (i.e., lower educated mother, lower educated father, and lowest income category). Of the other YOUth families where one of the parents is lower educated, 38.3% are in the top income category. A similar trend seems to exist in the other cohorts. This suggests that the macro-level sampling bias (i.e., underrepresentation of low SES and overrepresentation of high SES participants) reoccurs on a micro-level (i.e., underrepresentation of lower low SES and overrepresentation of higher low SES participants). When applying a stricter, perhaps more valid definition of 'low SES' – requiring being low SES on all SES indicators – some of the cohorts studied here might suffer from underrepresentation and undersampling more than our initial estimates suggest (Table 6.6). More important, a combination of multiple low SES factors – contrary to the presence of only one low SES factor – has previously been found to hamper psychosocial development (Evans et al., 2013). A considerable proportion of 'low SES' adolescents in the 6 cohorts have a single low SES risk factor for development (e.g., low educated mother) which might be compensated or outweighed by high SES protective factors (e.g., high educated father and high income). Hence, it should be questioned whether adolescents that are considered low SES in some cohorts are actually exposed to the developmental adversities that are typically associated with socioeconomic deprivation.

Second, the number of weighing variables was lower than planned. Besides mother's educational attainment, father's educational attainment, and family income, we intended

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to include mother's occupational level, father's occupational level, and neighborhood SES as weighing variables for raking. However, parental occupational level is measured differently across cohorts and national census (e.g., classification systems; number of categories; open vs. closed answers), and is currently incompatible. Neighborhood SES was a measure provided by The Netherlands Institute for Social Research (SCP) that got retracted halfway through our study (by SCP itself) due to validity concerns. Especially in the cohorts in which only mother's and father's educational attainment has been measured, our operationalization of SES leaves room for improvement. On the contrary, the raking procedure requires observed scores on all weighing variables, hence utilizing fewer SES variables would reduce the number of forced exclusions due to missing data. Furthermore, parental educational attainment is considered a strong indicator of family SES, and driving factor behind other SES indicators such as income and occupation (Erola et al., 2016). Indeed, Dutch census statistics indicate a strong positive association between educational attainment and income (CBS, 2011). However, it must be stressed here that in cohorts that measured both parental educational attainment and family income as SES indicators, a considerable number of adolescents from lower educated parents are still in the higher income categories. The association between educational attainment and income might therefore be different (i.e., weaker) in the cohorts compared to the population, suggesting an atypical low SES participant sample.

Representativeness is not a prerequisite for every research question; some researchers legitimately prioritize balanced sampling over representativeness for testing theories and models of development (Nohr & Olsen, 2013; Rothman et al., 2013). However, compared to smaller, individual studies, large population-based cohort studies may have the additional goal of extrapolating descriptive measures in the sample to the target population. To avoid both undersampling as well as underrepresentation, a sufficient number of lower SES participants in the sample is essential, especially when also considering attrition rates of low SES participants over time (i.e., measurement waves).

For studies on adolescent psychosocial development, we recommend to assess the socioeconomic validity of research samples: 1) by counting the number of SES indicators that are measured, 2) by checking for undersampling in any combination of SES indicators (e.g., lower educated parents and low income; also see Table 6.6), and 3) by contrasting the SES characteristics of excluded participants to those of included participants. Measuring SES through multiple indicators (e.g., mother's education, father's education, income) instead of a single indicator (e.g., mother's education) is more accurate in determining which range of the socioeconomic spectrum is – or is not – represented in the research sample (Thaning & Hällsten, 2020). While single SES indicators may have comparable proportions of participants per variable level (e.g., 33% lower educated mothers; 33% middle-educated mothers; 33% higher educated mothers), certain combinations of SES variable levels may still indicate underrepresentation of a socioeconomic group (e.g., 10%

lower educated mothers with low family income; see Table 6.6). Furthermore, identifying differences between excluded participants and included participants in socioeconomic status as well as in outcomes of interest (see for example Appendix F) is critical to the integrity of research conclusions and to reflect on recruitment and retention quality.

CONCLUSION

Estimates of normative social competence and behavioral control in adolescents remained unaffected after raking in 6 Dutch developmental cohorts, despite considerable deviations from the population in SES representativeness and small but significant differences in social competence and behavioral control between some SES strata in some cohorts. These findings are in line with earlier null results between high SES cohorts and population (e.g., Pizzi et al., 2012) and differ from studies that detect an overestimation in developmental outcomes after weighing (e.g., LeWinn et al., 2017). However, our raking procedure was severely limited by the small number of adolescents from the lower categories on all SES variables, high numbers of exclusions due to missing data, and the presumption of having assessed atypically developing low SES adolescents. The question of whether normative estimates of adolescent social competence and behavioral control is overestimated in the Dutch population is therefore not fully answered yet. Replication of our analyses in cohorts with a sufficient number of low SES adolescents, and sufficient variation in combinations of SES variable categories (e.g., equal number of adolescents with lower educated parents from low income families versus adolescents with lower educated parents from high income families) might reveal different estimates of normative social competence and behavioral control after raking. Adolescents with the lowest SES – whose development may in fact be hampered by a network of socioeconomic risk factors and who may potentially benefit most from research findings – largely remain outsiders to developmental research cohorts.

Preregistration

At the Open Science Framework (OSF), we preregistered the hypotheses and analyses for this study (osf.io/6kzys). The Appendices (A to F) and other supplementary materials, such as Table 8 (L-CID), Table 9 (RADAR), and Table 10 (TRAILS), are also made available here (osf.io/6jtgh). A few deviations from the preregistration must be acknowledged. Given the differences in sample size between cohorts, we redefined outliers on social competence or behavioral control as scores $\geq$ ($\pm$) 2.58 standard deviations from the mean, instead of 3 standard deviations. Contrary to our preregistration, no corrections

for multiple testing were applied, since a direct comparison of standardized scores was preferred over multiple significance tests. Significance testing between SES strata on social competence and behavioral control (Tables 6.2 – 6.7) was not preregistered nor corrected for multiple testing given the exploratory nature of the comparisons. These deviations from the preregistration are pragmatic in nature and are expected to have no considerable impact on the outcomes and conclusions of this study.
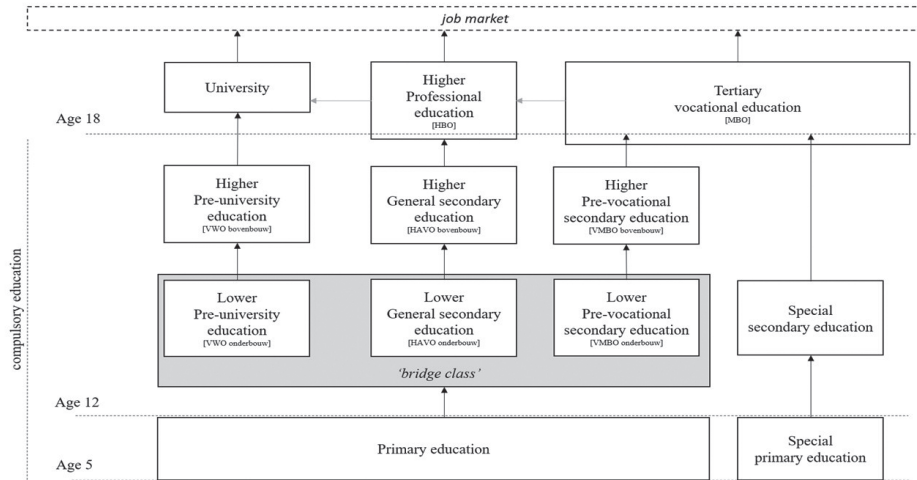
APPENDIX A

Table 6.A *Categorization of parental levels of educational attainment into lower, middle, and higher education per cohort and national census.*

	1 – Lower education	**2 – Middle education**	**3 – Higher education**
National census	1 = Primary education 2 = Vmbo-b/k, mbo1 3 = Vmbo-g/t, havo-, vwo-onderbouw	4 = Havo, vwo 5 = Mbo2 en mbo3 6 = Mbo4	7 = Hbo-, wo-bachelor 8 = Hbo-, wo-master, doctor
GenR	1 = No primary school completed 2 = Primary school, Special primary school, Special secondary school 3 = Pre-vocational and lower secondary education	4 = General secondary education (HAVO/VWO) 5 = Senior secondary vocational education (MBO)	6 = Higher professional (HBO); University
L-CID	1 = Elementary school/Primary education 2 = VMBO, MAVO, LBO, LTS, VSO, or equivalent	3 = HAVO, VWO, Gymnasium, MBO, MTS, MEAO, or equivalent	4 = HBO, HTS, propedeuse or bachelor University education 5 = Master University education, post-HBO education
NTR	1 = Elementary school 2 = Several years of lower general secondary school (mulo, mavo) 3 = Graduated from lower general secondary school 4 = Several years of lower vocational training (lts, domestic science school) 5 = Graduated from lower vocational training (lts, domestic science school) 6 = Several years of upper general secondary school (havo, vwo or hbs, athenaeum) 7 = Graduated from upper general secondary school (havo, vwo or hbs, athenaeum) 8 = Several years of intermediate vocational education	9 = Intermediate vocational education completed 10 = Several years of higher vocational education or university (hbo)	11 = Higher vocational education completed (hbo) 12 = University degree 13 = Post-graduate degree or PhD

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	1 – Lower education	2 – Middle education	3 – Higher education
RADAR	1 = None 2 = Kindergarten 3 = Primary education 4 = Special primary education (BLO, LOM) 5 = Special primary education (ZMOK, ZLK, ZMLK) 6 = School for physical, visual, or auditive impaired 7 = Higher special education (VSO-LOM, VSO-MLK) 8 = Lower secondary education (VBO) 9 = Lower secondary education (VMBO) 10 = Lower secondary education (MULO, MAVO, LAVO)	11=Higher secondary education (HAVO, VWO, HBS, MMS) 12 = Tertiary vocational education (MBO)	13 = Higher vocational education 14 = University or post-HBO education
TRAILS	1= No education 2= Primary (special) education 3= Lower secondary vocational education or equivalent (vglo, lavo, lbo, lts, lhno, huishoudschool, leao, ulo, mulo/mavo, at least 3 years havo/vwo (but not graduated), secondary special education)	4= Higher secondary education (hbs, mms, gymnasium, havo, vwo, mbo, mts, meao, leerlingwezen)	5= Higher education first degree (hbo, propedeuse or bachelor university education) 6= Higher education second degree (Master onderwijs, engineering degree, post-hbo education) 7= Hoger onderwijs derde trap (tweede fase opleiding, post-doctorale opleiding, promotie)
YOUth	1 = Primary education (BAO) 2 = Special primary education (SBAO) 3 = (Secondary) Special education ((V)SO) 4 = Practical education (PRO) 5 = Secondary vocational education 'basis/kader' (VMBO-BK) 6 = Secondary vocational education 'theoretische leergang' (VMBO-TL) 7 = Higher general secondary education (HAVO) 8= Higher secondary education (VWO)	9 = Tertiary vocational education (MBO)	10 = Higher vocational education (HBO) 11= University education (WO)

Figure 6.A *Simplified diagram of Dutch educational system corresponding to our educational classification approach.*

APPENDIX B

Income of the Dutch population was measured in the census as mean (gross or net) annual income of deciles (= equally sized 10% groups of households), corresponding to the year of data collection in the cohort. To create matching categories, we looked at census and cohort boundaries that fall closest to each other, and result in 5 categories with preferably more than 10% and less than 50% of the population (cohort proportions were fixed, though categories could be collapsed). None of the cohort income boundaries exactly matched census income boundaries, but given the mean income of the 10% groups in the population, we estimated the population percentage that is expected to be in each cohort category. According to the census statistics, the decile mean incomes are also the decile median incomes (i.e., normally distributed deciles). This is true for all deciles, expect for the lowest decile (i.e., median income higher than mean income) and highest decile (i.e., median income lower than mean income). The other 8 deciles could reliably be split into percentiles if necessary, to match census income boundaries to cohort income boundaries.

Table 6.B.1 *Original answer categories of net income in Generation R and percentage of adolescents (n = 3898) per category.*

Category	Income	%
I	< €1.200	4.0%
II	€1.200 – 2.000	10.4%
III	€2.000 – 3.200	14.9%
IV	€3.200 – 4.000	19.4%
V	> €4.000	51.4%

Table 6.B.2 *Mean net income per population decile of the Netherlands (2012).*

Deciles	Income	Deciles	Income
1e 10%	€ 569	6e 10%	€ 2623
2e 10%	€ 1231	7e 10%	€ 3077
3e 10%	€ 1554	8e 10%	€ 3600
4e 10%	€ 1869	9e 10%	€ 4354
5e 10%	€ 2223	10e 10%	€ 7185

Figure 6.B.1 *Mean net income per population decile of the Netherlands (2012).*
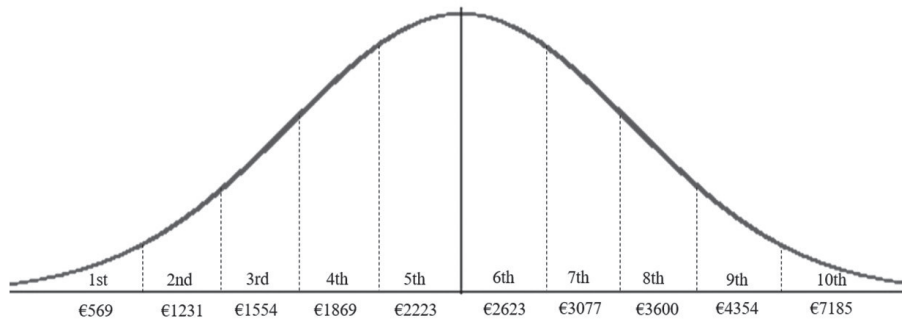
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
	€569	€1231	€1554	€1869	€2223	€2623	€3077	€3600	€4354	€7185

Next, the census data was matched to these cohort income categories to obtain population percentages (rounded off to 0.5).

I   The lowest cohort income boundary of €1200 falls between the mean incomes of the 1st and 2nd population deciles. If the mean income of the 1st decile is €569 and the mean income of the 2nd decile is €1231, and income is normally distributed in these two deciles, then the mean income is also the median income, meaning that €569 is also the mean income of the 5th percentile and €1231 the mean income of the 15th percentile: €1231 minus €569 = €662 divided by 10 (15 minus 5) = €66,20 increase per percentile.
€1231 minus €1200 = €31 / €66,20 ≈ 0.5% ◊ 15% - 0.5% = 14.5%
€1200 minus €569 = €631 / €66,20 ≈ 9.5%. ◊ 5% + 9.5% = 14.5%
So, 14.5% of the population has an income of < €1200.

II   The second cohort income boundary of €2000 falls between mean incomes of the 4th and 5th population deciles: €1869 is the mean income of the 35th percentile and €2223 is the mean income of the 45th percentile.
€2223 minus €1869= €354 / 10 = €35,40 per percentile.
€2223 minus €2000 = €223 / €35,40 ≈ 6.3% ◊ 45% - 6.3% ≈ 38%
€2000 minus €1869= €131 / €35,40 ≈ 3.7% ◊ 35% + 3.7% ≈ 38%
So, 38.7% minus 14.5% = 24.2% of the population has an income of €1200-€2000.

III   The third cohort income boundary of €3200 falls between mean incomes of the 7th and 8th population deciles: €3077 is the mean income of the 65th percentile and €3600 is the mean income of the 75th percentile.
€3600 minus €3077= €523 / 10 = €52,30 per percentile.
€3600 minus €3200 = €400 / €52,30 ≈ 7.7% ◊ 75% - 7.7% ≈ 67%
€3200 minus €3077= €123 / €52,30 ≈ 2.3% ◊ 65% + 2.3% ≈ 67%
So, 67% minus 38% = 29.0% of the population has an income of €2000-€3200.

IV   The fourth cohort income boundary of €4000 falls between mean incomes of the 8th and 9th population decile: €3600 is the mean income of the 75th percentile and €4354 is the mean income of the 85th percentile.
€4354 minus €3600 = €754 / 10 = €74,50 per percentile.
€4354 minus €4000 = €354 / €74,50 ≈ 4.8% ◊ 85% - 4.8% ≈ 80%
€4000 minus €3600 = €400 / €74,50 ≈ 5.4% ◊ 75% + 5.1% ≈ 80%
So, 80% minus 67% = 13.0% of the population has an income of €3200-€4000.•   Given the above calculations, 19.5% of the population is in the top income category of > €4000.

Figure 6.B.2 *Matching population boundaries to cohort boundaries of income. Percentages of Dutch population per category.*
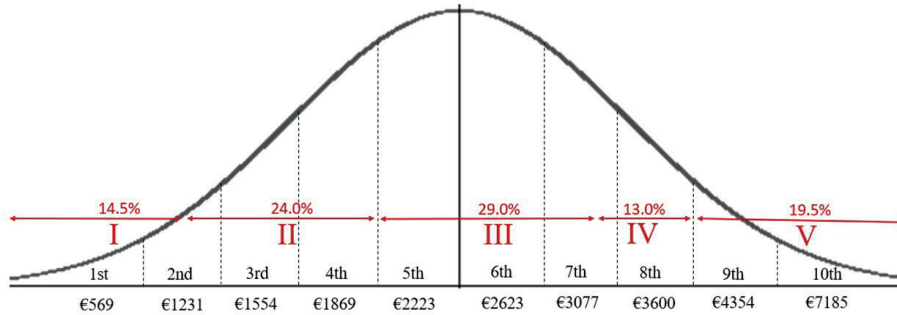
Given the above-mentioned considerations for creating matching categories, the original cohort categories were clustered as:

Table 6.B.4 *Percentage of Generation R adolescents and Dutch population per income category.*

Category	Income	% GenR	% Dutch population
I	<€1135	4.0%	14.5%
II	€1135 – €1590	10.4%	24.0%
III	€1590 – €2045	14.9%	29.0%
IV	€2045 – €2955	19.4%	13.0%
V	>€2955	51.4%	19.5%

Table 6.B.5 *Original answer categories of net income in TRAILS and percentage of adolescents (n = 1535) per category.*

Category	Income	%
1	<€680	0.9%
2	€680 – €1135	15.9%
3	€1135 – €1590	18.1%
4	€1590 – €2045	21.4%
5	€2045 – €2500	17.4%
6	€2500 – €2955	11.9%
7	€2955 – €3410	6.4%
8	€3410 – €3865	4.5%
9	>€3865	3.6%

Table 6.B.6 *Clustered income categories TRAILS.*

Category	Income	%
I	< €1135	7.0%
II	€1135 – €1590	16.9%
III	€1590 – €2045	23.7%
IV	€2045 – €2955	35.1%
V	> €2955	17.3%

Table 6.B.7 *Mean net income per population decile of the Netherlands (2001).*

Deciles	Income	Deciles	Income
1e 10%	€ 500	6e 10%	€ 1985
2e 10%	€ 970	7e 10%	€ 2300
3e 10%	€ 1200	8e 10%	€ 2675
4e 10%	€ 1550	9e 10%	€ 3225
5e 10%	€ 1690	10e 10%	€ 5185

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Figure 6.B.4 *Mean net income per population decile of the Netherlands (2001).*
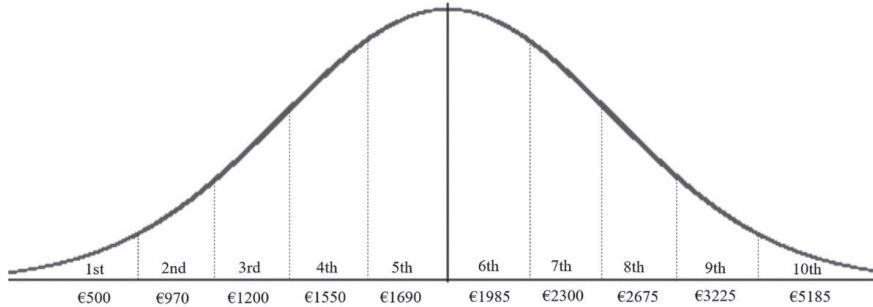
Next, the census data was matched to these cohort income categories to obtain population percentages.

VI The lowest cohort income boundary of €1135 falls between the mean incomes of the 2nd and 3rd population deciles. If the mean income of the 2nd decile is €970 and the mean income of the 3rd decile is €1200, and income is normally distributed in these two deciles, then the mean income is also the median income, meaning that €970 is also the mean income of the 15th percentile and €1200 the mean income of the 25th percentile: €1200 minus €970 = €230 divided by 10 (25 minus 15) = €23 increase per percentile.
€1200 minus €1135 = €65 / €23 ≈ 2.8% ◊ 25% - 2.8% = 22.2%
€1135 minus €970 = €165 / €23 ≈ 7.2%. ◊ 15% + 7.2% = 22.2%
So, 22.2% of the population has an income of < €1135.
VII The second cohort income boundary of €1590 falls between mean incomes of the 4th and 5th population deciles: €1550 is the mean income of the 35th percentile and €1690 is the mean income of the 45th percentile.
€1690 minus €1550 = €140 / 10 = €14 per percentile.
€1690 minus €1590 = €100 / €14 ≈ 7.1% ◊ 45% - 7.1% = 37.9%
€1590 minus €1550 = €40 / €14 ≈ 2.9% ◊ 35% + 2.9% = 37.9%
So, 37.9% minus 22.2% = 15.7% of the population has an income of €1135-€1590.
VIII The third cohort income boundary of €2045 falls between mean incomes of the 6th and 7th population deciles: €1985 is the mean income of the 55th percentile and €2300 is the mean income of the 65th percentile.
€2300 minus €1985 = €315 / 10 = €31,50 per percentile.
€2300 minus €2045 = €255 / €31,50 ≈ 8.1% ◊ 65% - 8.1% = 56.9%
€2045 minus €1985 = €60 / €31,50 ≈ 1.9% ◊ 55% + 1.9% = 56.9%
So, 56.9% minus 37.9% = 19.0% of the population has an income of €1590-€2045.
IX The fourth cohort income boundary of €2955 falls between mean incomes of the 8th and 9th population decile: €2675 is the mean income of the 75th percentile and €3225 is the mean income of the 85th percentile.
€3225 minus €2675 = €550 / 10 = €55 per percentile.
€3225 minus €2955 = €270 / €55 ≈ 4.9% ◊ 85% - 4.9% = 80.1%
€2955 minus €2675 = €280 / €55 ≈ 5.1% ◊ 75% + 5.1% = 80.1%
So, 80.1% minus 56.9% = 23.2% of the population has an income of €2045-€2955.
X Given the above calculations, 19.9% of the population is in the top income category of > €2955.

Figure 6.B.5 *Matching population boundaries to cohort boundaries of income. Percentages of Dutch population per category.*

Table 6.B.8 *Percentage of TRAILS adolescents and Dutch population per income category.*

Category	Income	% TRAILS	% Dutch population
I	<€1135	7.0%	22.2%
II	€1135 – €1590	16.9%	15.7%
III	€1590 – €2045	23.7%	19.0%
IV	€2045 – €2955	35.1%	23.2%
V	>€2955	17.3%	19.9%

Table 6.B.9 *Original answer categories of gross income in YOUth and percentage of adolescents (n = 595) per category.*

Category	Income	%
1	<€1250	1.5%
2	€1250 – €2000	4.0%
3	€2000 – €3000	6.4%
4	€3000 – €4000	15.8%
5	>€4000	72.3%

Table 6.B.10 *Median gross income per population decile of the Netherlands (2015).*

Deciles	Income	Deciles	Income
1e 10%	€ 1008	6e 10%	€ 4215
2e 10%	€ 1610	7e 10%	€ 5185
3e 10%	€ 2110	8e 10%	€ 6370
4e 10%	€ 2685	9e 10%	€ 8040
5e 10%	€ 3395	10e 10%	€ 11560

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
€1008	€1610	€2110	€2685	€3395	€4215	€5185	€6370	€8040	€11560

Figure 6.B.6 *Median gross income per population decile of the Netherlands (2015).*

Next, the census data was matched to these cohort income categories to obtain population percentages.

I The lowest cohort income boundary of €1250 falls between the median incomes of the 1st and 2nd population deciles: €1008 is also the mean income of the 5th percentile and €1610 the mean income of the 15th percentile:
€1610 minus €1008 = €602 divided by 10 (25 minus 15) = €60,20 increase per percentile.
€1610 minus €1250 = €360 / €60,20 ≈ 6.0% ◊ 15% - 6.0% = 9.0%
€1250 minus €1008 = €242 / €60,20 ≈ 4.0%. ◊ 5% + 4.0% = 9.0%
So, 9.0% of the population has an income of < €1250.

II The second cohort income boundary of €2000 falls between mean incomes of the 2nd and 3rd population deciles: €1610 is the mean income of the 15th percentile and €2110 is the mean income of the 25th percentile.
€2110 minus €1610 = €500 / 10 = €50 per percentile.
€2110 minus €2000 = €110 / €50 ≈ 2.2% ◊ 25% - 2.2% = 22.8%
€2000 minus €1610 = €390 / €50 ≈ 7.8% ◊ 15% + 7.8% = 22.8%
So, 22.8% minus 9.0% = 13.8% of the population has an income of €1250-€2000.

III The third cohort income boundary of €3000 falls between mean incomes of the 4th and 5th population deciles: €2685 is the mean income of the 35th percentile and €3395 is the mean income of the 45th percentile.
€3395 minus €2685 = €710 / 10 = €71 per percentile.
€3395 minus €3000 = €395 / €71 ≈ 5.6% ◊ 45% - 5.6% = 39.4%
€3000 minus €2685 = €315 / €71 ≈ 4.4% ◊ 35% + 4.4% = 39.4%
So, 39.4% minus 22.8% ≈ 16.6% of the population has an income of €2000-€3000.

IV The fourth cohort income boundary of €4000 falls between mean incomes of the 5th and 6th population decile: €3395 is the mean income of the 45th percentile and €4215 is the mean income of the 55th percentile.
€4215 minus €3395 = €820 / 10 = €82 per percentile.
€4215 minus €4000 = €215 / €82 ≈ 2.6% ◊ 55% - 2.6% = 52.4%
€4000 minus €3395 = €605 / €82 ≈ 7.4% ◊ 45% + 7.4% = 52.4%
So, 52.4% minus 39.4% = 13.0% of the population has an income of €3000-€4000.

V Given the above calculations, 47.6% of the population is in the top income category of > €4000.
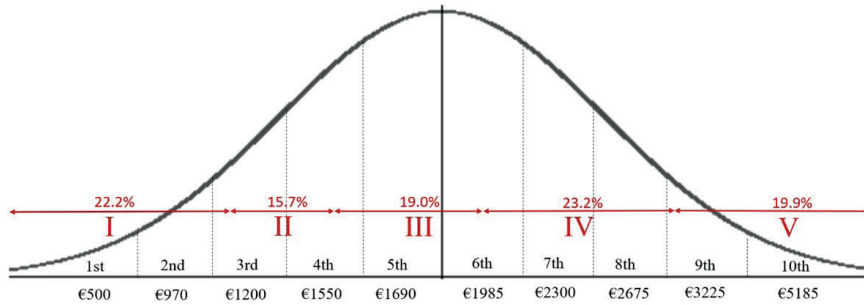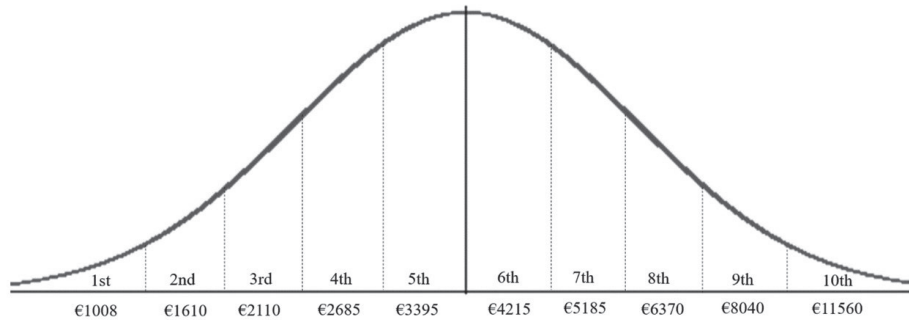
Figure 6.B.7 *Matching population boundaries to cohort boundaries of income. Percentages of Dutch population per category.*
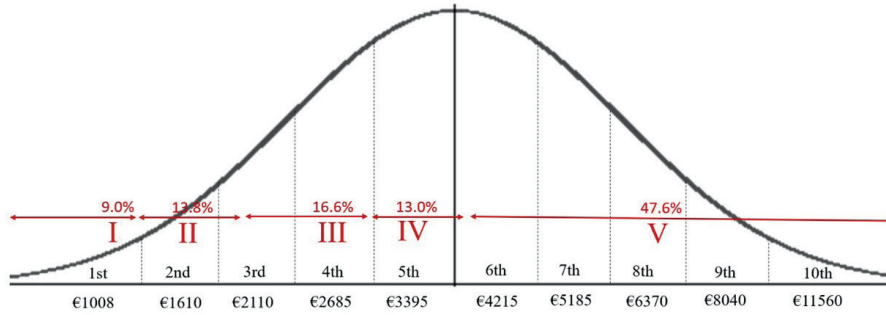
Table 6.B.11 *Percentage of YOUth adolescents and Dutch population per income category.*

Category	Income	% YOUth	% Dutch population
I	<€1250	1.5%	9.0%
II	€1250 – €2000	4.0%	13.8%
III	€2000 – €3000	6.4%	16.6%
IV	€3000 – €4000	15.8%	13.0%
V	>€4000	72.3%	47.6%

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APPENDIX C

Table 6.C *Correlations between SES indicators in all 6 cohorts.*

		1		2	3
Mother's education					
Father's education	GenR	0.48**			
	L-CID	0.31**			
	NTR	0.46**			
	RADAR	0.50**			
	TRAILS	0.54**			
	YOUth	0.35**			
Income	GenR	0.39**	GenR	0.41**	
	TRAILS	0.44**	TRAILS	0.52**	
	YOUth	0.24**	YOUth	0.29**	

**p < .01

APPENDIX D

Table 6.D *URL's to open source database from Statistics Netherlands. Last checked on January 24th, 2020.*

Cohort	URL's
GenR	Parental education Income
L-CID	Parental education
NTR	Parental education
RADAR	Parental education
TRAILS	Parental education Income
YOUth	Parental education Income

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APPENDIX E

Table 6.E *Mean item scores (SD), correlations [95% CIs], and effect sizes of social competence and behavioral control in unweighted versus weighted sample without outliers.*

	Measure	Unweighted		Weighted	Effect size
Social competence *Mean item scores (SD)*					
GenR	CBCL-SP	1.85 (0.19)		1.83 (0.20)	-0.12
L-CID	SDQ-PB	1.68 (0.27)		1.68 (0.26)	0.03
NTR	CBCL-SP	1.83 (0.20)		1.83 (0.20)	0.00
RADAR	R-PB	5.56 (0.89)		5.53 (0.90)	-0.03
TRAILS	CBCL-SP	1.84 (0.21)		1.83 (0.22)	-0.04
YOUth	SDQ-PB	1.70 (0.35)		1.67 (0.40)	-0.10
Behavioral control *Mean item scores (SD)*					
GenR	ASCS	1.65 (0.35)		1.65 (0.36)	0.02
L-CID	BAS-D	1.58 (0.62)		1.55 (0.61)	-0.04
NTR	ASCS	1.62 (0.36)		1.61 (0.35)	-0.01
RADAR	BAS-D	0.87 (0.49)		0.87 (0.50)	0.00
TRAILS	ASCS	1.58 (0.38)		1.57 (0.36)	-0.01
YOUth	ASCS	1.50 (0.39)		1.45 (0.39)	-0.14
Correlation *Social competence, Behavioral control*					
GenR	CBCL-SP, ASCS	0.52	[0.49, 0.54] ***	0.57	0.05
L-CID	SDQ-PB, BAS-D	0.10	[-0.08, 0.27]	0.06	-0.04
NTR	CBCL-SP, ASCS	0.57	[0.56, 0.60]	0.58	0.00
RADAR	R-PB, BAS-D	-0.23	[-0.32, -0.14]***	-0.23	0.00
TRAILS	CBCL-SP, ASCS	0.55	[0.49, 0.57]***	0.53	0.00
YOUth	SDQ-PB, ASCS	0.24	[0.15, 0.32]***	0.19	-0.05

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

APPENDIX F

For the raking procedure, it is essential that adolescents have observations on all weighting variables (i.e., SES variables), and on social competence *or* behavioral control. These inclusion criteria divided each original dataset into two: adolescents with full information that were to be 'included' versus adolescents with missing information that were to be 'excluded'. Per cohort, we checked whether excluded adolescents differed from included adolescents on the available SES indicators and measures of social competence and behavioral control. Note that the excluded adolescents per definition had missing information, and that each comparison with included adolescents is based on a *subset* of excluded adolescents (i.e., those with available data on the variable of interest).

GenR:
How many adolescents had to be excluded?
　　2875 of the 6770 adolescents (42.5%) were excluded for the raking procedure due to missing observations.

Do excluded adolescents differ in **mother's educational attainment** *from included adolescents?*
　　2360 of the 2875 excluded adolescents (82.1%) had reported mother's educational attainment. Excluded adolescents tend to have lower educated mothers than included adolescents.

Do excluded adolescents differ in **father's educational attainment** *from included adolescents?*
　　1799 of the 2875 excluded adolescents (62.6%) had reported father's educational attainment. Excluded adolescents tend to have lower father's education than included adolescents.

Do excluded adolescents differ in **income** *from included adolescents?*
　　875 of the 2875 excluded adolescents (30.4%) had reported income. These excluded adolescents were from lower income families than included adolescents.

Do excluded adolescents differ in **SocialCompetence_CBCL** *from included adolescents?*
　　1053 of the 2875 excluded adolescents (36.6%) had a score on SocialCompetence_CBCL. Excluded adolescents scored lower on SocialCompetence_CBCL than included adolescents.

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*Do excluded adolescents differ in **BehavioralControl_ASCS** from included adolescents?*

1041 of the 2875 excluded adolescents (36.2%) had a score on BehavioralControl_ASCS. These excluded adolescents scored lower on BehavioralControl_ASCS than included adolescents.

Conclusion: Excluded GenR adolescents have lower educated mothers and fathers and are from lower income families than included adolescents; and score lower on SocialCompetence_CBCL and BehavioralControl_ASCS.

L-CID:
How many adolescents had to be excluded?

14 of the 156 adolescents (9.0%) were excluded for the raking procedure due to missing observations.

*Do excluded adolescents differ in **mother's educational attainment** from included adolescents?*

All excluded adolescents had reported mother's educational attainment. Excluded adolescents tend to have lower educated mothers than included adolescents, though too few cases were available to draw strong conclusions.

*Do excluded adolescents differ in **father's educational attainment** from included adolescents?*

10 of the 14 excluded adolescents (71.4%) had reported father's educational attainment. Excluded adolescents tend to be similar in father's education to included adolescents, though too few cases were available to draw strong conclusions.

*Do excluded adolescents differ in **SocialCompetence_SDQ** from included adolescents?*

3 of the 14 excluded adolescents (21.4%) had a score on SocialCompetence_SDQ. Excluded adolescents scored similarly on SocialCompetence_SDQ than included adolescents, though too few cases were available to draw strong conclusions.

*Do excluded adolescents differ in **BehavioralControl_BASD** from included adolescents?*

Only 1 of the 14 excluded adolescents (7.1%) had a score on BehavioralControl_BASD. This excluded adolescent scored similarly on BehavioralControl_BASD as included adolescents, though no strong conclusions can be drawn from one single case.

Conclusion: Excluded L-CID adolescents have lower educated mothers but similarly educated fathers as included adolescents; and score similarly on SocialCompetence_SDQ and BehavioralControl_BASD, though note the small number of excluded cases.

NTR:

How many adolescents had to be excluded?

Of the 15270 adolescents in the original dataset of singletons, twins, or triplets; we randomly selected one adolescent per household = 7635. Of these 7635 adolescents, 1369 (17.9%) were excluded for the raking procedure due to missing observations.

*Do excluded adolescents differ in **mother's educational attainment** from included adolescents?*

1176 of the 1369 excluded adolescents (85.9%) had reported mother's educational attainment. Excluded adolescents tend to have lower educated mothers than included adolescents.

*Do excluded adolescents differ in **father's educational attainment** from included adolescents?*

724 of the 1369 excluded adolescents (52.9%) had reported father's educational attainment. Excluded adolescents tend to have lower educated fathers than included adolescents.

*Do excluded adolescents differ in **SocialCompetence_CBCL** from included adolescents?*

722 of the 1369 excluded adolescents (52.7%) had a score on SocialCompetence_CBCL. Excluded adolescents scored lower on SocialCompetence_CBCL than included adolescents.

*Do excluded adolescents differ in **BehavioralControl_ASCS** from included adolescents?*

716 of the 1369 excluded adolescents (52.3%) had a score on BehavioralControl_ASCS. Excluded adolescents scored lower on BehavioralControl_ASCS than included adolescents.

Conclusion: Excluded NTR adolescents have lower educated mothers and fathers than included adolescents; and score lower on SocialCompetence_CBCL and BehavioralControl_ASCS.

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RADAR:

How many adolescents had to be excluded?

    56 of 497 adolescents (11.3%) were excluded for the raking procedure due to missing observations.

*Do excluded adolescents differ in **mother's educational attainment** from included adolescents?*

    52 of the 56 excluded adolescents (94.6%) had reported mother's educational attainment. These excluded adolescents tend to have lower educated mothers than included adolescents.

*Do excluded adolescents differ in **father's educational attainment** from included adolescents?*

    Only 4 of the 56 excluded adolescents (7.1%) had reported father's educational attainment. Though father's educational attainment was similar between these excluded and included adolescents, the number of cases is too small to make meaningful comparisons.

*Do excluded adolescents differ in **SocialCompetence_RPB** from included adolescents?*

    52 of the 56 excluded adolescents (94.6%) had a score on SocialCompetence_RPB. These excluded adolescents scored similarly on SocialCompetence_RPB as included adolescents.

*Do excluded adolescents differ in **BehavioralControl_BASD** from included adolescents?*

    51 of the 56 excluded adolescents (91.1%) had a score on BehavioralControl_BASD. These excluded adolescents scored similarly on BehavioralControl_BASD as included adolescents.

Conclusion: Excluded RADAR adolescents have lower educated mothers but similarly educated fathers as included adolescents; and scored similarly on SocialCompetence_RPB and BehavioralControl_BASD.

TRAILS:

How many adolescents had to be excluded?

694 of 2229 adolescents (31.1%) were excluded for the raking procedure due to missing observations.

Do excluded adolescents differ in __mother's educational attainment__ from included adolescents?

478 of the 694 excluded adolescents (68.9%) had reported mother's educational attainment. These excluded adolescents tend to have lower educated mothers than included adolescents.

Do excluded adolescents differ in __father's educational attainment__ from included adolescents?

224 of the 694 excluded adolescents (32.3%) had reported father's educational attainment. These excluded adolescents tend to have similarly educated fathers as included adolescents.

Do excluded adolescents differ in __income__ from included adolescents?

472 of the 694 excluded adolescents (68.0%) had reported income. These excluded adolescents tend to be from lower income families than included adolescents.

Do excluded adolescents differ in __SocialCompetence_CBCL__ from included adolescents?

479 of the 694 excluded adolescents (69.0%) had a score on SocialCompetence_CBCL. These excluded adolescents scored lower on SocialCompetence_CBCL than included adolescents.

Do excluded adolescents differ in __BehavioralControl_BASD__ from included adolescents?

580 of the 694 excluded adolescents (83.6%) had a score on BehavioralControl_BASD. These excluded adolescents scored similarly on BehavioralControl_BASD as included adolescents.

Conclusion: Excluded TRAILS adolescents have lower educated mothers, similarly educated fathers, and are from lower income families than included adolescents; while also scoring lower on SocialCompetence_CBCL and on BehavioralControl_ASCS (but not on main measure BehavioralControl_BASD) than included adolescents.

YOUth:

How many adolescents had to be excluded?

235 of 830 adolescents (28.3%) were excluded for the raking procedure due to missing observations.

*Do excluded adolescents differ in **mother's educational attainment** from included adolescents?*

215 of the 235 excluded adolescents (91.5%) had reported mother's educational attainment. These excluded adolescents had similarly educated mothers as included adolescents.

*Do excluded adolescents differ in **father's educational attainment** from included adolescents?*

36 of the 235 excluded adolescents (15.3%) had reported father's educational attainment. These excluded adolescents had similarly educated fathers as included adolescents.

*Do excluded adolescents differ in **income** from included adolescents?*

207 of the 235 excluded adolescents (88.1%) had reported income. These excluded adolescents were from lower income families than included adolescents.

*Do excluded adolescents differ in **SocialCompetence_SDQ** from included adolescents?*

202 of the 235 excluded adolescents (86.0%) had reported father's educational attainment. These excluded adolescents scored similarly on SocialCompetence_SDQ as included adolescents.

*Do excluded adolescents differ in **BehavioralControl_ASCS** from included adolescents?*

225 of the 235 excluded adolescents (95.7%) had reported a score on BehavioralControl_ASCS. These excluded adolescents scored similarly on BehavioralControl_ASCS as included adolescents.

Conclusion: Excluded YOUth adolescents have similarly educated parents, but are from lower income families than included adolescents; while scoring similarly on SocialCompetence_CBCL and on BehavioralControl_ASCS.

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CHAPTER 7

SUMMARY AND GENERAL DISCUSSION

The purpose of this dissertation was to advance our understanding of the role of adolescent psychosocial competencies in the relationship between parental SES and young adulthood SES. To this end, we assessed the extent to which adolescents' behavioral control and social competence affect social reproduction and social mobility. Combining all findings, we conclude that socioeconomic differences in behavioral control were small to none, and therefore behavioral control appears to play no role in social reproduction. Behavioral control did however have a positive direct effect on young adulthood SES outcomes (educational attainment in particular), but not more so for adolescents with a low parental SES than for those with a high parental SES. Hence, adolescents with a lower parental SES and high levels of behavioral control are more likely to attain a higher SES in young adulthood than their parents – thus experiencing intergenerational social mobility – but are unlikely to catch up to adolescents with a high parental SES and high levels of behavioral control. Social competence was mostly unrelated to both parental SES and young adulthood SES, and therefore appears to play no role in social reproduction or social mobility. Our findings indicate that adolescent psychosocial competencies have a modest impact on the attainment of young adulthood SES, while the positive effect of parental SES on young adulthood SES remains prominent. Hence, more structural solutions that go beyond the individual adolescent's responsibility may be required to further attenuate the predominant effect of parental SES on young adulthood SES.

The findings in this dissertation are considerably affected by socioeconomic differences in participant inclusion and retention. In particular, families with a lower SES were less likely to participate in our studies and also more likely to drop out across waves. Considering that for example adolescents with low levels of behavioral control were also more likely to drop out, we may be missing crucial data which potentially has far-reaching consequences for research conclusions and their generalizability to the population. If more families and adolescents with a lower SES could have been included and retained, we may have found associations between parental SES, adolescent behavioral control and social competence, and young adulthood SES to be more in line with principles of social reproduction or social mobility. The inclusion and retention challenges experienced in our samples are not unique in the field of developmental psychology, though a critical reflection on its consequences sometimes is. Considering the impact of this pattern for the dissertation as a whole, it is mentioned here as a disclaimer and may again be referred to briefly or in more detail throughout the rest of the discussion. In this final chapter, we will aim to summarize our main findings per empirical chapter, reflect on theoretical and practical implications, and provide suggestions for future research.

SUMMARY OF MAIN FINDINGS PER CHAPTER

The covid-19 pandemic and lockdown situation offered a challenging but unique opportunity for Youth Got Talent to assess fundamental socioeconomic differences in precarity among late adolescents in vocational education (**Chapter 2**). Before covid-19, adolescents with a lower parental SES reported a weaker sense of control, less parental support, and ultimately, less positive (SES-related) future orientations than adolescents with a higher parental SES. Contrary to our expectations, these socioeconomic differences from before covid-19 did not increase but remained mostly stable during the early months of the covid-19 pandemic and lockdown. More specifically, a similar decline in positive future orientations was observed among adolescents with a lower and a higher SES, average levels of sense of control remained mostly stable from before to during covid-19, and adolescents with a higher parental SES even reported a stronger decline in parental support than adolescents with a lower parental SES. Chapter 2 also reveals how some adolescents in the most precarious living circumstances may be among the first to drop out of research in times of crisis, potentially resulting in the false conclusion that socioeconomic status does not affect adolescents' experiences.

While in Chapter 2 family affluence and future orientations were particularly relevant during the covid-pandemic, in later chapters we assessed broader indicators of socioeconomic status, such as educational attainment and income. In **Chapter 3**, we investigated if social reproduction could in part be explained by an intergenerational transmission of parental conflict behaviors, and adolescent conflict behaviors, emotion regulation, and empathy. Utilizing RADAR data of 320 adolescents and their parents, results from our longitudinal serial mediation analyses suggested that social reproduction occurred primarily between mothers and daughters, and much less so involved fathers and sons. Contrary to our expectations, social reproduction was not explained by an intergenerational transmission of conflict behaviors, or adolescent emotion regulation and empathy. More specifically, parents with a lower SES largely displayed similar conflict behaviors as parents with a higher SES, except that higher educated mothers displayed more constructive conflict behaviors than lower educated mothers. Parents who displayed more constructive and less destructive conflict behaviors were more likely to have adolescents who displayed more constructive and less destructive conflict behaviors, as well as more emotion regulation and empathy. In turn, adolescents with better emotion regulation were more likely to have a higher educational attainment and a higher income in young adulthood. In contrast, some findings suggested that adolescents with more empathy were more likely to have a lower educational attainment and a lower income in young adulthood. Overall, Chapter 3 rejects the notion of the *family stress model* that parents with a lower SES display poorer conflict behaviors than parents with

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a higher SES, and thus that social reproduction is not mediated by parent-adolescent psychosocial transmissions.

Besides social reproduction, we investigated the role of adolescent psychosocial competencies in social mobility. In **Chapter 4**, we used TRAILS data of 2,175 adolescents to investigate if adolescent effortful control and peer support mitigate the associations of parental SES with educational attainment and of family support with educational attainment. Adolescents with a higher parental SES were consistently more likely to end up in a higher educational level, but family support was hardly associated with educational level. Neither effortful control nor peer support buffered (i.e., negatively moderated) the associations of parental SES and family support with educational level. Adolescents with higher levels of effortful control were more likely to attain a higher educational level, regardless of their parental SES or family support. Peer support and family support were unrelated to social reproduction. These results were mostly similar from early to mid- adolescence and from mid-adolescence to young adulthood. Overall, we can conclude from Chapter 4 that behavioral control helps adolescents with a lower parental SES attain a higher educational level, but not more so than adolescents with a higher parental SES. As such, adolescent psychosocial competencies do not suffice to fully compensate socioeconomic inequalities in educational attainment.

Chapter 5 extends our investigations of social mobility by including more elaborate measures of social competence and intelligence. Using the same dataset, we investigated intelligence, effortful control, assertiveness, and peer competence in early adolescence as potential predictors of upward or downward social mobility in young adulthood. Based on parental SES (Low/Mid/High) and young adulthood SES (Low/Mid/High), six social mobility groups (e.g., Low/High) and three social reproduction groups (e.g., Mid/Mid) were identified. Each social mobility group (e.g., Low/High) was contrasted to their social origin group (i.e., Low/Low) and their social destination group (i.e., High/High), in terms of intelligence, effortful control, assertiveness, and peer competence in early adolescence. Adolescents with higher levels of intelligence than peers in the social origin group were more likely to experience upward mobility in young adulthood, despite having lower levels of intelligence than peers in the social destination group. Similarly, adolescents with lower levels of intelligence than peers in the origin group were more likely to experience downward mobility, despite having higher levels of intelligence than peers in the destination group. Adolescents with higher levels of effortful control were more likely to experience upward mobility, but adolescents with lower levels of effortful control were not more likely to experience downward mobility. Neither assertiveness nor peer competence were associated with social mobility. Hence, in line with Chapter 4, Chapter 5 shows how adolescent behavioral control – but not adolescent social competence – is a relevant factor for experiencing social mobility.

Chapter 6 aimed to quantify the specific effect of undersampling families with a low SES on normative estimates of adolescent behavioral control and social competence. More specifically, we investigated if the undersampling of families with a low SES has resulted in an overestimation of normative behavioral control and social competence in adolescents, using data from 6 large developmental cohort studies in the Netherlands. Furthermore, we investigated if this potential overestimation can be corrected by statistically making existing samples more representative of the Dutch population (using a raking procedure). We expected to find that mean scores of behavioral control and social competence would decrease after applying the raking procedure (i.e., reflecting a correction of the overestimated norms). Similarly, we expected correlations between behavioral control and social competence to change after applying the raking procedure. Contrary to our expectations, estimates and correlations of behavioral control and social competence remained unaffected by our raking procedure (i.e., similar before and after weighing to population estimates).

It could be argued that the small number of participating families with a low SES may not be fully representative of the low SES population, but instead, reflect a small subpopulation of well-functioning families with a low SES. As a result, the quantitative and qualitative undersampling of families with a low SES limits corrections by a statistical procedure such as raking. Overall, Chapter 6 provides important insights into the underrepresentation of families with a low SES and the limitations for statistical corrections, to help better interpret findings regarding the role of adolescent psychosocial competencies in social reproduction and social mobility throughout this dissertation. Main findings per chapter are also summarized in Table 7.1.

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Table 7.1 *Summary of main findings.*

	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6
Questions	Do socioeconomic differences in sense of control, parental support, and positive future orientations among adolescents increase during covid-19?	Is the intergenerational transmission of SES mediated by the intergenerational transmission of conflict behaviors, and adolescent emotion regulation and empathy?	Do adolescent effortful control and peer support buffer against the negative effects of low parental SES and low family support on educational attainment?	Are intelligence, effortful control, and social competence in early adolescence associated with social mobility in young adulthood?	Does an underrepresentation of families with a low SES contribute to an overestimation of 'normative' behavioral control and social competence in adolescents?
Method	Latent Change Score modeling	Structural equation modeling; Serial mediation analyses	Multinomial logistic regression	Multinomial logistic regression	Raking procedure with population weights
Main Findings	Before covid-19, adolescents with a lower parental SES had a weaker sense of control, less parental support, and less positive future orientations than adolescents with a high parental SES. The pre-covid socioeconomic differences in adolescents' positive future orientations and sense of control remained stable during covid-19, whereas the socioeconomic difference in parental support decreased during covid-19.	Parental SES is mostly unrelated to parental constructive and destructive conflict behaviors, whereas parental conflict behaviors are positively related with adolescent conflict behaviors and emotion regulation, but not empathy. Intergenerational associations are strongest between mothers and daughters. Adolescent emotion regulation is positively related with young adulthood SES, but adolescent empathy is negatively related with young adulthood SES.	Adolescents with a lower parental SES were less likely to attain a higher educational level at both age 16 and age 26, whereas family support was mostly unrelated to educational attainment. Neither effortful control nor peer support buffered against the negative effect of low parental SES on educational attainment. However, effortful control had a positive direct effect on educational attainment. Findings were mostly similar from early to mid-adolescence and from mid-adolescence to young adulthood.	Adolescents with higher levels of intelligence and effortful were more likely to experience upward mobility, whereas adolescents with lower levels of intelligence – but not effortful control – were more likely to experience downward mobility. Social competence – i.e., assertiveness and peer competence – was mostly not related to upward or downward mobility.	Adolescents with a low SES are severely underrepresented and have lower scores on behavioral control and social competence, but raking did not produce different normative estimates.

	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6
Conclusion	The covid-19 situation has not substantially increased socioeconomic differences in positive future orientations and sense of control, and in fact decreased socioeconomic differences in parental support among adolescents. However, the decline in positive future orientations and parental support among adolescents with a low parental SES may have more negative real-life consequences than the decline among adolescents with a high parental SES.	We found support for the *social selection* hypothesis, as parental conflict behaviors affected adolescent psychosocial competencies which in turn were associated with young adulthood SES outcomes. However, our findings reject the *social causation* hypothesis as parents with a lower SES were found to display similar conflict behaviors as parents with a higher SES. Hence, the intergenerational transmission of SES is **not** mediated by parent and adolescent psychosocial competencies.	Adolescent effortful control and peer support do **not** buffer against negative effects of low parental SES and low family support. Regardless of socioeconomic background, adolescents may benefit from having more effortful control for attaining a higher educational level. However, effortful control can **not** fully compensate for socioeconomic differences in educational attainment – for which more structural changes may be required.	Our findings that intelligence and effortful control are important factors for social mobility is in line with the *meritocracy hypothesis*, and not in line with the *glass ceiling/glass floor hypothesis*. Psychosocial competencies are more relevant for experiencing upward mobility than downward mobility.	If families with a low SES are too severely undersampled; or if participating families with a low SES are not representative of the low SES population; or in the case of much missing data, statistical attempts to correct for sampling bias may be ineffective.

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KEY FINDINGS AND THEIR IMPLICATIONS

The main aim of this dissertation was to investigate the role of adolescent psychosocial competencies in social reproduction and social mobility. Combining longitudinal and cross-sectional findings from all chapters, based on different measures, adolescent developmental periods, raters, and control variables, our four objectives are answered in three key findings. We will also reflect on theoretical and practical implications, provide suggestions for future research, and conclude this dissertation.

1. Adolescent behavioral control is mostly not relevant for social reproduction

We find no convincing evidence that adolescent behavioral control is a key factor through which SES is transmitted across generations. While adolescent behavioral control is an important predictor of young adulthood SES outcomes, parental SES has only a small to negligible positive effect on adolescent behavioral control. For example, RADAR data revealed no cross-sectional or longitudinal socioeconomic differences in adolescent emotion regulation or conflict behaviors (Chapter 3). Cross-sectional assessments across all CID cohorts revealed some socioeconomic differences in adolescent self-control, but inconsistently across cohorts and inconsistently between SES groups (Chapter 6). Similarly, cross-sectional correlations in TRAILS revealed small socioeconomic differences in effortful control at age 11, but not at age 16 (Chapters 4 and 5). While cross-sectional evidence for socioeconomic differences in adolescent behavioral control is weak, it seems to be even weaker in frameworks with longitudinal measures and multiple control variables.

In contrast, the positive associations between adolescent behavioral control and young adulthood SES outcomes are modest but robust, and overall more convincing. Both in cross-sectional (Chapters 4 and 5) as well as longitudinal settings (Chapter 3), effortful control and emotion regulation in adolescence are positively associated with educational attainment or income in young adulthood. We therefore conclude that adolescent behavioral control has a negligible role in social reproduction, hence, parents with a higher SES do not raise adolescents with better behavioral control who as a result attain a higher SES themselves.

2. Adolescent behavioral control facilitates social mobility, but does not compensate socioeconomic inequalities

The role of adolescent behavioral control in social mobility was assessed primarily in Chapters 4 and 5. We consistently found that adolescents with higher levels of effortful control are more likely to attain a higher young adulthood SES than adolescents with lower levels of effortful control, even when controlling for social support, social competence, and intelligence. Hence, behavioral control helps adolescents from a lower SES background attain a higher young adulthood SES than their parents. However, behavioral control does not attenuate the positive effect of parental SES on young adulthood SES: adolescents with a higher parental SES similarly benefit from higher levels of behavioral control for their educational attainment. So, while behavioral control helps adolescents with a lower parental SES experience upward mobility relative to their parents, it does not compensate for structural socioeconomic inequalities in education (e.g., lack of study materials).

3. Adolescent social competence plays no role in social reproduction or social mobility

Overall, we found no convincing evidence of socioeconomic differences in adolescent social competence, or that higher levels of adolescent social competence are positively associated with better young adulthood SES outcomes. In Chapter 3, no socioeconomic differences in empathy were observed among adolescents from the RADAR cohort. Moreover, higher levels of empathy were negatively associated with educational attainment and income in young adulthood, primarily among girls. Partial evidence from Chapter 4 also suggests that more peer support is potentially negatively associated with educational attainment. Similarly, cross-sectional findings indicate that parental SES was mostly not or inconsistently associated with peer competence (Chapter 5) and social competence (Chapter 6); which in turn were inconsistently associated with educational attainment in young adulthood. Only adolescent assertiveness was positively associated with both parental SES and young adulthood SES (Chapter 5), but this is based on correlational findings without control variables. Given the inconsistency and relative weakness of associations, we conclude that adolescent social competence does not explain part of social reproduction. Similarly, we found no evidence that adolescent social competence is a driving factor behind social mobility. Neither assertiveness, peer competence (Chapter 5), or peer support (Chapter 4) convincingly help adolescents move up from a lower parental SES to a higher young adulthood SES, or vice versa. Hence, the role of adolescent psychosocial competencies in intergenerational social reproduction and social mobility is smaller than we expected.

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STRENGTHS AND LIMITATIONS

This dissertation has several strengths. We studied data from 7 large research samples, containing over 14,000 adolescents from all across the Netherlands, including urban and rural areas. This is likely to benefit the generalizability of our research findings on a geographical level. Across datasets, we used several different measures of parental SES, adolescent behavioral control, adolescent social competence, and young adulthood SES. These measures were also obtained at different developmental stages, from early to late adolescence, and into young adulthood. Furthermore, we used a variety of statistical approaches and sensitivity analyses to accurately estimate associations of interest. All these characteristics contribute to the robustness of research findings and conclusions presented in this dissertation. Additional strengths of this dissertation include the consistent pre-registration and open access publishing of studies, and the use of the free software program R for our key analyses – making our research procedures transparent and accessible to researchers around the world.

This dissertation also has several limitations. First and foremost, the majority of our samples include only a small number of families with a low SES. In a dissertation about intergenerational SES transmission, for which socioeconomic status is both a key predictor (i.e., parental SES) and outcome variable (i.e., young adulthood SES), this limitation is likely to have considerably affected our findings and conclusions. As such, our research findings are somewhat limited in generalizability to the population. Furthermore, as rates of social reproduction and social mobility differ between countries, our conclusions regarding the role of adolescent psychosocial competencies in the intergenerational transmission of SES may only be generalizable to countries with somewhat similar societal characteristics (such as Belgium or Switzerland, but not the UK and the US; OECD, 2018).

Another important limitation of this dissertation is the absence of genetic measures. Behavioral control and intelligence for example have strong genetic underpinnings, and overall the phenotypical expression of adolescent psychosocial competencies are considerably affected by gene-environment interactions (Belsky et al., 2018; McGue et al., 2017). Controlling for genetic parent-adolescent transmission could have further disentangled the impact of genetic influences and environmental influences in the processes of social reproduction and social mobility. Furthermore, insights into the extent to which social reproduction and social mobility are genetically driven would have added important nuances to the discussion on (a saturated) meritocracy and individual responsibility (Fletcher, 2023; Flynn, 1999).

Similarly, the exclusive use of parental report and adolescent self-report to measure psychosocial competencies may be considered a limitation to the robustness of our findings. Socioeconomic differences in behavioral ratings have previously been observed among parents. Parents with a lower SES rated their own parental behaviors as well as

adolescent behaviors more negatively than did neutral observers, whereas parents with a higher SES rated those behaviors more similarly to the neutral observers (Herbers et al., 2017). If such an effect occurred in our studies, small socioeconomic differences in parent-reported adolescent psychosocial competencies (e.g., effortful control in Chapter 4) may be the result of stigma more than actually reflecting differences in competence. Additionally, considerable differences in ratings of adolescent behaviors have been observed between parental reports and adolescent self-report (Kevenaar et al., 2021). Some of our null findings (e.g., no socioeconomic differences in parent-reported family support) could be significant if reported by adolescents instead. Despite these limitations, we believe that our approach across chapters has been extensive enough to yield robust findings and conclusions.

THEORETICAL IMPLICATIONS

Our findings reject key assumptions of *social causation* theories, such as the *family stress model* and the *family investment model* that claim adolescents growing up in a low SES context to have poorer psychosocial competencies than those growing up in a high SES context. Instead, our findings point to three theoretical alternatives: 1) adolescents with a lower parental SES can attain similar levels of behavioral control and social competence as adolescents with a higher parental SES by putting in extra efforts that were unmeasured in this dissertation (e.g., avoiding distractions and temptations in the neighborhood; Nieuwenhuis & Hooimeijer, 2016)); 2) parents with a low SES experience economic hardships and stress, but manage to shield their adolescents from this and provide an environment in which the development of behavioral control and social competence goes unimpeded (Brown et al., 2020); or 3) adolescents with a low parental SES, and poor behavioral control and social competence were not sufficiently included or retained in the studies described in this dissertation, which would mean that the *social causation* theories have not been tested rigorously and could still hold up in the Dutch context (see Chapters 2 and 6, for example). While evidence for the third alternative explanation is strong, the findings in this dissertation are robust and likely to in part reflect (null) associations in the population. Considering that the processes of social reproduction and social mobility are complex, subject to societal influences, family and peer influences, genetic factors, and even luck (Mackenbach et al., 2017), our findings have a number of modest practical implications.

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PRACTICAL IMPLICATIONS FOR ADOLESCENTS

Individual-level suggestions to affect socioeconomic (dis)continuity across generations align well with adolescents' desire for autonomy and independence (Arnett & Hughes, 2012). Following the findings of this dissertation, it could be recommended to explore the efficacy of a behavioral control training program as a means to further facilitate equality of opportunity, when for example delivered at school, online, or at home by parents (Pandey et al., 2018). This recommendation is based on two main conclusions: 1) adolescent behavioral control is an important predictor for young adulthood SES outcomes, and 2) a low SES context does not seem to limit adolescents' innate ability to develop or display appropriate levels of behavioral control. Though potential improvements in behavioral control may be limited (e.g., by adolescents' genetic predispositions; Krapohl et al., 2014), some training programs have been found to deliver robust improvements that spill over to real-world situations (Allom et al., 2016; Boendermaker et al., 2017). The range of improvement may be insufficient to make a substantial improvement in one's SES relative to peers (i.e., intragenerational), but it may result in the attainment of a higher SES than one's parents – especially if parents never had such type of additional training growing up.

Behavioral control training programs can still have considerable limitations for affecting social reproduction and social mobility. First of all, our findings (in Chapter 4 in particular) also nuance the idea that psychosocial competencies, such as behavioral control, improves the opportunities of adolescents from disadvantaged backgrounds to attain a higher educational level similar to those adolescents from more privileged backgrounds (Duckworth & Schoon, 2012; Tough, 2012). Hence, while a training program to enhance behavioral control may benefit adolescents with a low parental SES in their pursuit of a higher education, it will most likely equally benefit adolescents with a high parental SES – thus not leading to 'catch-up effects' to nullify structural inequalities (Damian et al., 2015).

Second of all, a behavioral control training program is unlikely to benefit all adolescents. Especially considering that we find no substantial socioeconomic differences in behavioral control to begin with, it could be argued that adolescents with a low parental SES have already developed their behavioral control to an optimal extent. Moreover, adolescents who maintain high levels of behavioral control for too long risk suffering negative health outcomes (Miller et al., 2015) and social isolation (Chen et al., 2022). Such findings are in line with the alternative idea that displaying "poor behavioral control" (e.g., impulsivity) is to some extent *adaptive* in a low SES context of scarcity and unpredictability (Ellis et al., 2017). Furthermore, those adolescents who are expected to benefit most from training programs (i.e., those from underprivileged backgrounds with underdeveloped psychosocial competences) tend to have the weakest sense of self-

efficacy and sense of control, while also relatively frequently dealing with mental health issues (Bodovski, 2014; Ross & Mirowsky, 2013). A behavioral control training program should take all such considerations into account in order to help adolescents develop appropriate behaviors for various environments. Perhaps, adolescents with a middle parental SES, who experience a moderate amount of opportunities as well as limitations, may end up benefitting most from a behavioral control training program (Esping-Andersen & Wagner, 2012; Przybylski & Weinstein, 2017). Our findings would discourage the implementation of a social competence training program, as social competence is mostly unrelated to social reproduction and social competence within our samples (see for example Chapter 3).

PRACTICAL IMPLICATIONS FOR PARENTS

Our findings mostly reject theoretical propositions and common believes that parents with a lower SES raise adolescents with poorer psychosocial competencies (e.g., *family stress model*). As such, our findings may help reduce stigma and prejudice – including positive stereotypes about parents with a high SES. However, this conclusion must also be interpreted in the light of our sampling challenges. Possibly, parents with a low SES who displayed suboptimal parenting behaviors have insufficiently been included or retained in our studies. Socioeconomic differences in parenting behaviors that contribute to adolescent differences in psychosocial competencies (e.g., conflict resolution) may exist in the population – as originally hypothesized.

It nonetheless remains important to point out that our findings suggest that despite having a lower SES numerous parents manage to raise adolescents with high levels of behavioral control and social competence. The relatively small effect sizes between parental SES and parental conflict behaviors with adolescent psychosocial competencies (Chapter 3) suggest that (a complex combination including) other factors explain social reproduction and social mobility, largely beyond parental influence. An important question for future research is *at what (psychological) cost* parents with a lower SES manage to raise adolescents with high levels of psychosocial competence (e.g., marital strain), compared to parents with a higher SES.

Parental support and family support were mostly unrelated to young adulthood SES outcomes. It must be noted however that social support within the family has consistently been reported as high, which suggests two points. First, low parental support could be detrimental to adolescent psychosocial development and young adulthood SES attainment, but adolescents who receive little parental support are almost per definition unlikely to participate in developmental research (e.g., because

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of consent requirements). Second, social reproduction and social mobility may not be affected by more parental support beyond moderate levels of support. Other parenting behaviors could increase adolescents' chances of attaining a higher SES, for example parental academic expectations and academic involvement (Davis-Kean, 2005), and clear structures and routines at home (Evans & English, 2002). Ironically, such alternative parenting behaviors may not always be experienced as supportive by adolescents, and instead increase pressure and stress (Peng et al., 2023; Silinskas et al., 2013). Future research should not only investigate which parental behaviors increase adolescent's chances of attaining a higher SES, but more specifically, how to balance these different parenting behaviors optimally. Potentially, social reproduction and social mobility may not merely depend on the quantity of specific parenting behaviors, but more so its balancing and effective application in particular situations (e.g., discussing future orientations during school transitions). Last, it must also be stressed that attaining a higher SES is not the most important goal in life for adolescents, and therefore perhaps should not be overemphasized by parents (and society at large). It may however be an important prerequisite to what is deemed important by adolescents themselves, such as buying a house, starting a family, and being able to give back to their community (Brown, 2011; Visser et al., 2022).

PRACTICAL IMPLICATIONS FOR TEACHERS AND SCHOOLS

Our findings underline the importance of intelligence and behavioral control for adolescents to be successful in the educational system. However, explicit opportunities for learning about and practicing such cognitive competencies, self-regulation, and impulse control are notoriously absent from the educational curriculum – despite numerous studies pointing out the importance of such skills as well as their (modest) trainability. Hence, this dissertation provides further support for teachers and schools to implement classes regarding cognitive and psychosocial competencies. Such classes would also align well with the overarching goals of primary and secondary education specifically (e.g., teaching adolescents how to learn). While recommendations like these are not new (Peeters et al., 2022), our findings further illustrate the need for curricular adjustments in an otherwise slow-to-change educational system. The implementation of such adjustments may perhaps not be realized in time to benefit the current generation of adolescents but hopefully the next.

The above recommendation would help further solidify a meritocratic educational system, and eventually could result in a saturated meritocracy: parents with a high SES and high levels of intelligence and behavioral control raise adolescents with high levels

of intelligence and behavioral control who also attain a high young adulthood SES, and eventually go on to raise their own adolescents to have high levels of intelligence and behavioral control, etc. Inherent to such a system is also that adolescents with less cognitive competencies and less behavioral control are explicitly and implicitly labeled as 'losers', despite the presence of numerous other competencies (Sandel, 2021). Such a byproduct of a meritocracy is not only detrimental to a large group of adolescents, but also suboptimal for society as a whole. For example, the labor market values a much broader variety of competencies, including social competencies, problem solving, creativity, and ability to act quick (Balcar, 2016; Binkley et al., 2012). The seemingly overemphasis on intelligence and behavioral control in the current educational system insufficiently matches that demand, which contributes to economic inefficiency but also deteriorates social cohesion. Schools should consider a broader appreciation of diverse adolescent competencies. Specifically, schools and teachers could aim to provide more customized education to stimulate talent discovery and development. Given the current high workload of teachers (e.g., Maas et al., 2021), such a refocus should not increase the burden but instead replace for example redundant bureaucratic duties (e.g., elaborate performance tracking) or could be part of student's elective curriculum (e.g., as alternative to philosophy or foreign language learning).

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PRACTICAL IMPLICATIONS FOR RESEARCHERS AND UNIVERSITIES

Structural characteristics of a low SES context (e.g., occupational inflexibility; family stress) as well as structural characteristics of current recruitment and research practices (e.g., relatively complex information brochures and informed consent forms) may underlie the consistent undersampling of families with a low SES observed throughout this dissertation. While socioeconomic hardships in itself may not improve, there seems considerable room for improving research practices to better facilitate the research participation of families with a low SES. First and foremost, it is recommended that researchers (or universities and research funders) raise the financial compensation for research participation (Walter et al., 2013). This will reduce the 'cost' of research participation for parents with a vocational occupation who are expected to miss out on income in order to visit the lab. While the current financial compensation is not too bad – above minimum wage but below modal wage – there are vast differences in reimbursement across studies and across fields, depending on numerous factors such as how burdensome it is for participants. For example, participation in medical research is generally compensated with between €120 and €220 per day, whereas participation in psychological research is generally compensated with between €7 to €10 per hour.

Additionally, researchers and universities may more explicitly advocate for research participation to be recognized as part of civic duty or important volunteer work. Under many collective labor agreements (cao's), community service leave ('maatschappelijk verlof') will allow parents to get paid leave for coming to the lab. It is also important that the financial compensation for occasional research participation should be tax deductible – or at least not result in the reduction of social welfare (e.g., by paying in gift cards, though *cash is king*; Van Veen et al., 2015). The implementation of these three suggestions will provide the actual financial freedom to participate, without being unduly motivating. The precise impact of these measures can be considered worth testing in a Dutch context to further identify (financial) requirements and barriers for research participation, particularly among families with a low SES.
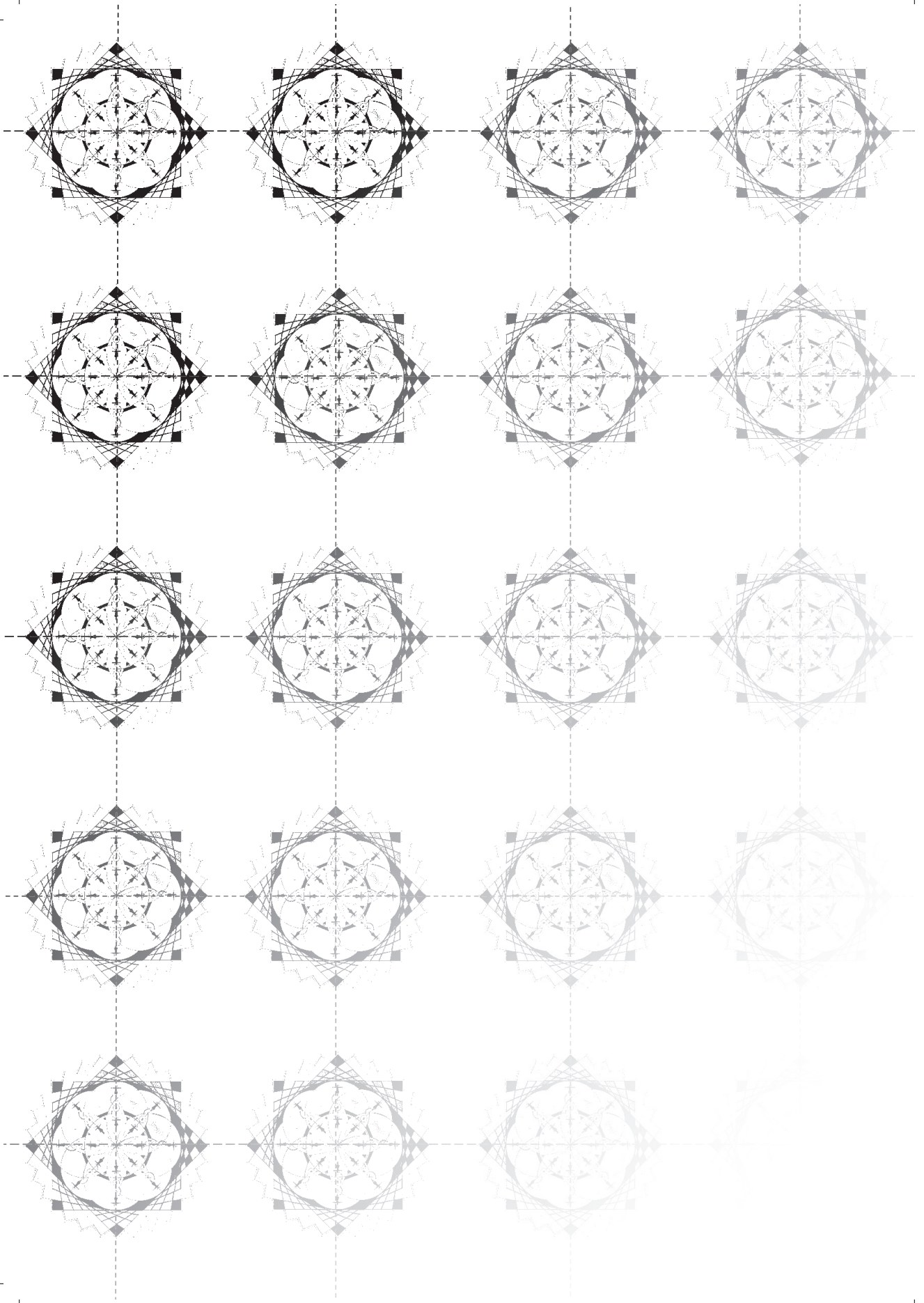
Besides financial barriers, numerous research regulations that aim to accurately inform, protect, and respect potential participants may in fact – unintentionally – discourage, intimidate, and exclude families with a lower SES (Kadam, 2017). For example, most research brochures and informed consent forms contain too much complex information for some parents, despite preventing jargon. We therefore suggest a broader application of alternative information procedures. Some parents, often those with a vocational education background, may have a strong preference to be informed face-to-face or through a phone call instead of being expected to critically read and understand a formal brochure after a hard day's work.

It must also be stated that under current regulations, various possibilities to expand recruitment efforts already exist. For example, most ethical committees are open to approve passive consent, identifying reasons for non-inclusion and attrition, recruitment through key community persons and employers, and somewhat higher reimbursements. However, universities and funding agencies may take a more prominent role in communicating and encouraging these existing (or novel) recruitment strategies. For example by avoiding ambiguous requirements (e.g., "reasonable assessment"; "straightforward procedures") and more explicitly communicating the reasons for (dis)approving certain strategies (Angell et al., 2010). Until then, individual researchers themselves may lack incentives to propose alternative, potentially more successful recruitment strategies that are at risk of being rejected, which would further increase workload, delay data collection, and damage reputations.

CONCLUSION

The general aim of this dissertation was to better understand to what extent adolescent psychosocial competencies affect the socioeconomic (dis)continuity across generations. More specifically, we investigated if adolescent behavioral control and adolescent social competence affect the processes of social reproduction and social mobility. Combining all research findings, we conclude that adolescent behavioral control is mostly of relevance for young adulthood SES outcomes, but is not considerably affected by parental SES. Behavioral control is more important as a factor that facilitates social mobility than a mechanism for social reproduction. As such, adolescent behavioral control has a small impact on the intergenerational transmission of SES. In contrast, adolescent social competence is mostly unrelated to the processes of social reproduction and social mobility. No considerable socioeconomic differences in adolescent social competence were observed, and no consistent associations between adolescent social competence and young adulthood SES were observed.

   This dissertation also shows the extent to which the undersampling of families with a low SES is a wide-spread issue in developmental psychology, how it may considerably affect research findings and conclusions, and how statistical techniques can only correct such shortcomings to a small extent. The key conclusion of this dissertation would therefore be that there is a strong scientific and societal need to better involve families with a low SES in developmental research, in order to better understand associations between parental SES, adolescent psychosocial competencies, and young adulthood SES. Such intensive, long-term collaborations can further progress the field's understanding of socioeconomic challenges that adolescents experience – and inspire tailored guidance for the successful transmission into young adulthood.

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Chapter 8

Samenvatting (Summary in Dutch)

References

Dankwoord (Acknowledgements)

Curriculum Vitae

SAMENVATTING

Veel adolescenten bereiken als volwassenen een vergelijkbare sociaaleconomische status (SES) als hun ouders. Dit fenomeen van sociale reproductie komt zowel internationaal als in Nederland veelvuldig voor (OESO, 2018). Zo bereikt ongeveer de helft van de Nederlandse adolescenten een vergelijkbaar opleidingsniveau als hun ouders en belandt ongeveer 1 op de 3 Nederlandse adolescenten uiteindelijk in hetzelfde inkomenskwintiel als hun ouders (Van den Brakel & Moonen, 2013; Weinberg et al., 2019). Een aanzienlijk deel van de adolescenten ervaart echter sociale mobiliteit: in plaats van dezelfde SES als hun ouders te bereiken, stijgen ze of dalen ze op de sociale ladder. De meeste moderne samenlevingen streven ernaar om ervoor te zorgen dat de SES die adolescenten uiteindelijk bereiken voornamelijk het resultaat is van hun eigen competenties, en niet van de sociaaleconomische omstandigheden bij de geboorte (Sandel, 2021). Zo'n 'meritocratische' samenleving wordt over het algemeen gezien als rechtvaardiger en efficiënter dan een meer 'aristocratische' samenleving (waarbij SES in de jongvolwassenheid voornamelijk wordt bepaald door de sociaaleconomische achtergrond van de ouders) (De Beer & Van Pinxteren, 2016; Heckman, 2006).

Er is echter relatief weinig bekend over welke individuele competenties bepalen of adolescenten sociale reproductie of sociale mobiliteit ervaren. Zelfs wanneer rekening wordt gehouden met ouderlijke SES en cognitieve competenties van adolescenten, blijft een aanzienlijk deel van de behaalde sociaaleconomische status in de jongvolwassenheid onverklaard (Fergusson, 2008; Weinberg et al., 2019). Dit suggereert dat de statusverwerving van adolescenten meer omvat dan alleen de ouderlijke SES en cognitieve competenties, maar de rol van andere mogelijk relevante (niet-cognitieve) competenties blijft tot op heden enigszins onduidelijk. Onderzoek naar niet-cognitieve, psychosociale competenties als mogelijke factoren in sociale reproductie en sociale mobiliteit heeft de laatste jaren toenemende belangstelling gekregen (Blanden et al., 2007; Bourne et al., 2018). Sommige onderzoekers beweren zelfs dat dergelijke psychosociale competenties mogelijk relevanter zijn voor sociale reproductie of sociale mobiliteit dan cognitieve competenties (Bowles & Gintis, 2002; Farkas, 2003), hoewel deze bewering nog onvoldoende empirisch is getoetst.

Ons huidige gebrekkige begrip maakt het lastig te beoordelen of mechanismen van sociale stratificatie – met name het onderwijssysteem – daadwerkelijk rechtvaardig en effectief zijn (De Beer & Van Pinxteren, 2016). Hierdoor blijft het een uitdaging om effectieve beleidsmaatregelen te identificeren om gelijke kansen te bevorderen. In sommige samenlevingen die zichzelf als meritocratisch beschouwen, zoals de VS (Fergusson et al., 2008) en Nederland (Zumbuehl et al., 2022), hangt het onderwijsniveau waarop adolescenten worden gestratificeerd bijvoorbeeld nog steeds voor een belangrijk deel af van de sociaaleconomische achtergrond (naast leerpotentie). Daarom

is verder onderzoek naar individuele competenties die relevant zijn voor sociale reproductie en sociale mobiliteit essentieel om beter te begrijpen hoe adolescenten hun sociaaleconomische status als jongvolwassenen bereiken. Echter, gezien de complexe, kostbare en tijdsintensieve aard van longitudinaal jeugdonderzoek, is de rol van dit soort competenties in sociale reproductie en sociale mobiliteit tot nu toe slechts bescheiden onderzocht.

Twee concepten in het bijzonder - gedragscontrole en sociale competentie bij adolescenten - hebben veelbelovende maar discutabele verbanden laten zien met zowel ouderlijke SES als SES op jongvolwassen leeftijd (bijvoorbeeld in een cross-sectionele context of met een beperkt aantal controlevariabelen). De voorgestelde positieve verbanden tussen de belangrijkste variabelen houden mogelijk geen stand in een complexer, realistischer kader (zie Figuur 1.1); en hebben daarom momenteel mogelijk beperkte waarde voor beleidsvorming (bijvoorbeeld op het gebied van kansenongelijkheid in het onderwijs). Gezien al het bovenstaande kunnen vier doelstellingen worden gespecificeerd voor dit proefschrift, namelijk het onderzoeken van de rol van 1) gedragscontrole bij adolescenten in sociale reproductie; 2) gedragscontrole bij adolescenten in sociale mobiliteit; 3) sociale competentie bij adolescenten in sociale reproductie; en 4) sociale competentie bij adolescenten in sociale mobiliteit.

BELANGRIJKSTE BEVINDINGEN

Om onze doelstellingen te bereiken hebben we gegevens geanalyseerd van meer dan 14.000 adolescenten uit 7 datasets (Tabel 1.1), waarvan de meeste beschikbaar waren voor dit proefschrift via het *Consortium on Individual Development* (CID). CID heeft als doel om te begrijpen en te voorspellen hoe de wisselwerking tussen kenmerken van het kind en omgevingsfactoren leidt tot individuele verschillen in de ontwikkeling van sociale competentie en gedragscontrole. Het consortium is een langdurige samenwerking tussen onderzoekers van 6 ontwikkelingscohortstudies: *RADAR* (Universiteit Utrecht), *TRAILS* (Universitair Medisch Centrum Groningen), *Generation R* (Erasmus Universiteit), *L-CID* (Universiteit Leiden), *NTR* (VU Amsterdam) en *YOUth* (Universiteit Utrecht en Universitair Medisch Centrum Utrecht). Naast de CID-cohorten hebben we ook gegevens gebruikt van het *Youth Got Talent*-project (Universiteit Utrecht).

Door longitudinale en cross-sectionele modellen uit alle hoofdstukken van dit proefschrift te combineren (zie Figuur 7.1), gebaseerd op verschillende maatstaven van sociaaleconomische status, gedragscontrole en sociale competentie, over verschillende ontwikkelingsperioden van adolescenten, beoordelaars en controlevariabelen, worden onze vier doelstellingen beantwoord met drie belangrijke bevindingen:

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1. Gedragscontrole bij adolescenten is grotendeels niet relevant voor sociale reproductie

We vinden geen overtuigend bewijs dat gedragscontrole bij adolescenten een sleutelfactor is waardoor SES tussen generaties wordt overgedragen. Hoewel gedragscontrole bij adolescenten een belangrijke voorspeller is van SES in de jongvolwassenheid, heeft ouderlijke SES slechts een gering tot verwaarloosbaar positief effect op gedragscontrole bij adolescenten. Gegevens van *RADAR* toonden bijvoorbeeld geen cross-sectionele of longitudinale sociaaleconomische verschillen aan in emotieregulatie of conflictgedrag van adolescenten (Hoofdstuk 3). Cross-sectionele vergelijkingen in alle CID-cohorten onthulden enkele sociaaleconomische verschillen in zelfcontrole bij adolescenten, maar dit was inconsistent tussen cohorten en ook tussen SES-groepen (Hoofdstuk 6). Op vergelijkbare wijze toonden cross-sectionele correlaties in TRAILS kleine sociaaleconomische verschillen aan in inspanningscontrole op 11-jarige leeftijd, maar niet op 16-jarige leeftijd (Hoofdstukken 4 en 5). Hoewel het cross-sectionele bewijs voor sociaaleconomische verschillen in gedragscontrole bij adolescenten zwak is, lijkt dit nog zwakker te zijn in modellen met longitudinale metingen en meerdere controlevariabelen.

Daarentegen zijn de positieve verbanden tussen gedragscontrole bij adolescenten en SES in de jongvolwassenheid bescheiden maar robuust, en over het algemeen overtuigender. Zowel in cross-sectionele modellen (Hoofdstukken 4 en 5) als longitudinale modellen (Hoofdstuk 3) zijn inspanningscontrole en emotieregulatie in de adolescentie positief geassocieerd met educatieve prestaties of inkomen op jongvolwassen leeftijd. We concluderen dan ook dat gedragscontrole bij adolescenten een verwaarloosbare rol speelt in sociale reproductie. Meer specifiek zorgen ouders met een hogere SES er niet voor dat adolescenten betere gedragscontrole hebben en daardoor zelf een hogere SES bereiken.

2. Gedragscontrole bij adolescenten faciliteert sociale mobiliteit, maar compenseert niet voor sociaaleconomische ongelijkheden

De rol van gedragscontrole bij adolescenten in sociale mobiliteit werd voornamelijk onderzocht in Hoofdstukken 4 en 5. We hebben consequent vastgesteld dat adolescenten met hogere niveaus van inspanningscontrole meer kans hebben om een hogere sociaaleconomische status te bereiken in de jongvolwassenheid dan adolescenten met lagere niveaus van inspanningscontrole, zelfs wanneer wordt gecontroleerd voor sociale ondersteuning, sociale competentie en intelligentie. Gedragscontrole helpt adolescenten met een lagere ouderlijke SES dus om een hogere SES in de jongvolwassenheid te bereiken.

Gedragscontrole vermindert echter niet het positieve effect van ouderlijke SES op de SES in de jongvolwassenheid: adolescenten met een hogere ouderlijke SES profiteren evenzeer van hogere niveaus van gedragscontrole voor hun educatieve prestaties. Gedragscontrole helpt adolescenten met een lagere ouderlijke SES dus om opwaartse mobiliteit te ervaren ten opzichte van hun ouders, maar compenseert niet voor structurele sociaaleconomische ongelijkheden in het onderwijs (bijvoorbeeld gebrek aan studiematerialen).

3. De sociale competentie van adolescenten speelt geen rol in sociale reproductie of sociale mobiliteit

Over het algemeen vonden we geen overtuigend bewijs voor sociaaleconomische verschillen in sociale competentie bij adolescenten, of dat hogere niveaus van sociale competentie bij adolescenten positief geassocieerd zijn met SES in de jongvolwassenheid. In Hoofdstuk 3 werden geen sociaaleconomische verschillen in empathie waargenomen bij adolescenten uit het *RADAR*-cohort. Bovendien waren hogere niveaus van empathie negatief geassocieerd met educatieve prestaties en inkomen in de jongvolwassenheid, voornamelijk bij meisjes. Gedeeltelijk bewijs uit Hoofdstuk 4 suggereert ook dat meer ondersteuning van leeftijdsgenoten mogelijk negatief geassocieerd is met educatieve prestaties. Op vergelijkbare wijze suggereren cross-sectionele bevindingen dat ouderlijke SES grotendeels niet of inconsistent geassocieerd was met gemak in de omgang met leeftijdsgenoten (Hoofdstuk 5) en sociale competentie (Hoofdstuk 6); die vervolgens inconsistent geassocieerd waren met educatieve prestaties in de jongvolwassenheid. Alleen assertiviteit bij adolescenten was positief geassocieerd met zowel ouderlijke SES als SES in de jongvolwassenheid (Hoofdstuk 5), maar dit is gebaseerd op cross-sectionele bevindingen zonder controlevariabelen. Gezien de inconsistentie en relatief zwakke verbanden, concluderen we dat sociale competentie bij adolescenten geen deel van sociale reproductie verklaart. Op dezelfde manier vonden we geen bewijs dat sociale competentie bij adolescenten een drijvende factor is achter sociale mobiliteit. Zowel assertiviteit, gemak in de omgang met leeftijdsgenoten (Hoofdstuk 5) als steun van leeftijdsgenoten (Hoofdstuk 4) helpen adolescenten niet om op te klimmen vanuit een lagere ouderlijke SES naar een hogere SES in de jongvolwassenheid (dan wel te dalen). De rol van psychosociale competenties bij adolescenten in intergenerationele sociale reproductie en sociale mobiliteit is daarom kleiner dan we hadden verwacht.

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THEORETISCHE IMPLICATIES

Onze bevindingen verwerpen belangrijke aannames van *sociale causatie* theorieën, zoals het *familie stress model* en het *familie-investeringsmodel*, die beweren dat adolescenten die opgroeien in een lage SES-context minder goede psychosociale competenties zouden hebben dan degenen die opgroeien in een hoge-SES context. In plaats daarvan wijzen onze bevindingen op drie theoretische alternatieven: 1) adolescenten met een lagere ouderlijke SES kunnen vergelijkbare niveaus van gedragscontrole en sociale competentie bereiken als adolescenten met een hogere ouderlijke SES door extra inspanningen te leveren die niet werden gemeten in dit proefschrift (bijvoorbeeld afleidingen en verleidingen vermijden in de buurt; Nieuwenhuis & Hooimeijer, 2016)); 2) ouders met een lage SES ervaren economische moeilijkheden en stress, maar slagen erin hun adolescenten hiervan af te schermen en een omgeving te bieden waarin de ontwikkeling van gedragscontrole en sociale competentie ongehinderd verloopt (Brown et al., 2020); of 3) adolescenten met een lage ouderlijke SES en zwakke gedragscontrole en sociale competentie werden onvoldoende geïncludeerd of behouden in de onderzoeken die in dit proefschrift worden beschreven, wat zou betekenen dat de theorieën van *sociale causatie* niet rigoureus zijn getest en nog steeds stand kunnen houden in de Nederlandse context (zie bijvoorbeeld Hoofdstukken 2 en 6). Hoewel het bewijs voor de derde alternatieve verklaring sterk is, zijn de bevindingen in dit proefschrift robuust en in ieder geval gedeeltelijk een afspiegeling van (nul)verbanden in de populatie. Gezien het feit dat de processen van sociale reproductie en sociale mobiliteit complex zijn en onderhevig zijn aan maatschappelijke invloeden, invloeden van gezin en leeftijdsgenoten, genetische factoren en zelfs geluk (Mackenbach et al., 2017), hebben onze bevindingen bescheiden praktische implicaties.

PRAKTISCHE IMPLICATIES

Het zou aanbevolen kunnen worden om de doeltreffendheid van een trainingsprogramma voor gedragscontrole te verkennen als een middel om gelijke kansen verder te bevorderen, bijvoorbeeld door het aan te bieden op school, online of thuis door ouders (Pandey et al., 2018). Deze aanbeveling is gebaseerd op twee belangrijke conclusies: 1) gedragscontrole bij adolescenten is een belangrijke voorspeller voor resultaten van SES in de jongvolwassenheid, en 2) een lage SES-context lijkt de mogelijkheid van adolescenten om passende niveaus van gedragscontrole te ontwikkelen of te vertonen niet te beperken. Hoewel mogelijke verbeteringen in gedragscontrole beperkt kunnen zijn (bijvoorbeeld door genetische aanleg; Krapohl et al., 2014), hebben sommige trainingsprogramma's

aangetoond dat ze robuuste verbeteringen kunnen bieden die ook van invloed zijn op situaties in het echte leven (Allom et al., 2016; Boendermaker et al., 2017).

Trainingsprogramma's voor gedragscontrole kunnen echter aanzienlijke beperkingen hebben voor het beïnvloeden van sociale reproductie en sociale mobiliteit. Zo zal zo'n trainingsprogramma waarschijnlijk evenzeer ten goede komen aan adolescenten met een hoge ouderlijke SES, waardoor geen 'inhaaleffecten' ontstaan om structurele ongelijkheden teniet te doen (Damian et al., 2015). Bovendien suggereren sommige van onze bevindingen dat adolescenten met een lage ouderlijke SES hun gedragscontrole al tot een optimaal niveau hebben ontwikkeld. Daarnaast kan het handhaven van te hoge niveaus van gedragscontrole gedurende een langere periode leiden tot een verslechterde gezondheid (Miller et al., 2015) en sociale isolatie (Chen et al., 2022).

Waar inspanningen van adolescenten kunnen bijdragen aan een hogere SES in de jongvolwassenheid zijn ouderlijke steun en gezinssteun juist grotendeels niet gerelateerd aan deze resultaten. Het moet echter worden opgemerkt dat sociale steun binnen het gezin consistent als hoog werd gerapporteerd in onze onderzoeken, wat op twee punten wijst. Ten eerste kan lage ouderlijke steun schadelijk zijn voor de psychosociale ontwikkeling van adolescenten en de SES van jongvolwassenen, maar adolescenten die weinig ouderlijke steun ontvangen zullen bijna per definitie hoogstwaarschijnlijk niet deelnemen aan ontwikkelingsonderzoek (bijvoorbeeld in verband met ouderlijke toestemming). Ten tweede worden sociale reproductie en sociale mobiliteit mogelijk niet verder beïnvloed door méér ouderlijke steun zodra dit boven een voldoende niveau komt. Andere ouderlijke gedragingen zouden de kansen van adolescenten om een hogere sociaaleconomische status te bereiken kunnen vergroten. Denk bijvoorbeeld aan educatieve verwachtingen en betrokkenheid (Davis-Kean, 2005), en duidelijke structuren en routines thuis (Evans & English, 2002). Ironisch genoeg worden dergelijke alternatieve ouderlijke gedragingen door adolescenten niet altijd ervaren als ondersteunend, maar verhogen ze eerder de ervaren druk en stress (Peng et al., 2023; Silinskas et al., 2013).

Voor toekomstig onderzoek moet niet alleen worden onderzocht welke ouderlijke gedragingen de kansen van adolescenten vergroten om een hogere sociaaleconomische status te bereiken, maar meer specifiek hoe deze verschillende ouderlijke gedragingen optimaal kunnen worden gebalanceerd. Mogelijk zijn sociale reproductie en sociale mobiliteit niet alleen afhankelijk van de *hoeveelheid* specifieke ouderlijke gedragingen, maar vooral van de balans en effectieve toepassing ervan in specifieke situaties (bijvoorbeeld bespreken van toekomstoriëntaties tijdens schoolovergangen). Ten slotte moet ook worden benadrukt dat het bereiken van een hogere SES niet het belangrijkste levensdoel is van adolescenten, en daarom wellicht niet overdreven benadrukt moet worden door ouders (en de samenleving als geheel). Het kan echter een belangrijke voorwaarde zijn voor wat wél belangrijk wordt geacht door adolescenten zelf, zoals

het kopen van een huis, het stichten van een gezin en het kunnen teruggeven aan hun gemeenschap (Brown, 2011; Visser et al., 2022).

Naast het gezin kunnen ook leraren en scholen de bevindingen in dit proefschrift benutten. Onze bevindingen benadrukken het belang van intelligentie en gedragscontrole voor het succes van adolescenten in het onderwijssysteem, waarvan scholen en leraren zich bewust zullen zijn. Echter, expliciete kansen om te leren over en het oefenen van dergelijke cognitieve competenties, zelfregulering en impulscontrole ontbreken opvallenderwijs in het onderwijscurriculum. Dergelijke kansen zouden toch ook goed passen bij de overkoepelende doelen van het primaire en secundaire onderwijs (namelijk adolescenten leren hoe ze moeten leren).

Bovendien zouden scholen een bredere waardering van diverse competenties moeten overwegen. De arbeidsmarkt waardeert bijvoorbeeld een veel breder scala aan competenties, waaronder sociale competenties, probleemoplossend vermogen, creativiteit en flexibiliteit (Balcar, 2016; Binkley et al., 2012). De ogenschijnlijke nadruk op intelligentie en gedragscontrole in het huidige onderwijssysteem sluit onvoldoende aan bij die vraag, wat bijdraagt aan economische inefficiëntie maar ook de sociale cohesie verslechtert. Specifiek zouden scholen en leraren kunnen streven naar meer op maat gemaakt onderwijs om talentontdekking en -ontwikkeling te stimuleren. Gezien de huidige hoge werkdruk van leraren (Maas et al., 2021), zou een dergelijke heroriëntatie de belasting niet moeten verhogen, maar in plaats daarvan overtollige bureaucratische taken kunnen vervangen (bijvoorbeeld uitgebreide prestatiebeoordelingen) of deel kunnen uitmaken van het aanbod van keuzevakken voor studenten (bijvoorbeeld als alternatief voor filosofie of een vreemde taal).

Om de inclusie en betrokkenheid van gezinnen met een lage SES te verbeteren, zouden universiteiten en onderzoeksfinanciers kunnen worden aangespoord om de financiële vergoeding voor deelname aan onderzoek te verhogen (Walter et al., 2013). Dit zou de 'kosten' van deelname aan onderzoek verlagen voor ouders met een minder gunstige arbeidspositie die verwacht worden inkomsten te missen om het laboratorium te bezoeken. Bovendien kunnen universiteiten onderzoeksdeelname expliciet erkennen als onderdeel van de burgerschapsplicht of belangrijk vrijwilligerswerk. Onder veel collectieve arbeidsovereenkomsten (cao's) biedt maatschappelijk verlof ouders de mogelijkheid om betaald verlof te nemen voor een laboratoriumbezoek. Het is ook wenselijk dat de financiële vergoeding voor incidentele onderzoeksdeelname fiscaal aftrekbaar is, of op zijn minst niet leidt tot vermindering van sociale uitkeringen. De implementatie van deze drie suggesties zal daadwerkelijke financiële vrijheid bieden om deel te nemen, zonder buitensporige motivatie te geven. De precieze impact van deze maatregelen kan het overwegen waard zijn om te testen in een Nederlandse context om (financiële) vereisten en barrières voor onderzoeksdeelname verder te identificeren, met name onder gezinnen met een lage SES.

Naast financiële barrières zijn er talloze reglementen omtrent jeugdonderzoek die als doel hebben om potentiële deelnemers nauwkeurig te informeren, te beschermen en te respecteren, maar die in feite onbedoeld gezinnen met een lagere sociaaleconomische status kunnen ontmoedigen, intimideren en uitsluiten (Kadam, 2017). De meeste brochures en toestemmingsformulieren bevatten bijvoorbeeld te veel complexe informatie voor sommige ouders, ondanks het voorkomen van vakjargon. We stellen daarom een breder gebruik van alternatieve informatieprocedures voor. Sommige ouders hebben mogelijk een sterke voorkeur om persoonlijk of via een telefoongesprek te worden geïnformeerd in plaats van na een lange werkdag een formele brochure kritisch moeten lezen en begrijpen. Het moet ook worden opgemerkt dat onder de huidige ethische regelgeving al verschillende mogelijkheden bestaan om wervingsinspanningen uit te breiden. Echter, individuele onderzoekers kunnen prikkels missen om ongebruikelijke, potentieel succesvollere wervingsstrategieën voor te stellen die het risico lopen te worden afgewezen door de ethische commissie, wat de werkdruk verder zou vergroten, de gegevensverzameling zou vertragen en de reputatie zou schaden.

CONCLUSIE

Het doel van dit proefschrift was om een beter begrip te krijgen van de mate waarin psychosociale competenties van adolescenten van invloed zijn op de sociaaleconomische (dis)continuïteit tussen generaties. We onderzochten of gedragsbeheersing en sociale competentie van adolescenten van invloed zijn op de processen van sociale reproductie en sociale mobiliteit. Alle onderzoeksbevindingen in ogenschouw nemend, concluderen we dat gedragsbeheersing van adolescenten voornamelijk van belang is voor SES (sociaaleconomische status) in de jongvolwassenheid, maar niet aanzienlijk wordt beïnvloed door ouderlijke SES. Gedragsbeheersing is belangrijker als factor die sociale mobiliteit faciliteert dan als een mechanisme voor sociale reproductie. Als zodanig heeft gedragsbeheersing van adolescenten een kleine invloed op de sociaaleconomische (dis) continuïteit tussen generaties. Sociale competentie van adolescenten is daarentegen grotendeels niet gerelateerd aan de processen van sociale reproductie en sociale mobiliteit. Er werden geen aanzienlijke sociaaleconomische verschillen in de sociale competentie van adolescenten waargenomen en er werden geen consistente verbanden tussen de sociale competentie van adolescenten en de SES in de jongvolwassenheid waargenomen.

Dit proefschrift laat ook zien in hoeverre de ondervertegenwoordiging van gezinnen met een lage SES een wijdverbreid probleem is in de ontwikkelingspsychologie, hoe dit de onderzoeksbevindingen en conclusies aanzienlijk kan beïnvloeden, en hoe statistische technieken dergelijke tekortkomingen slechts in beperkte mate kunnen corrigeren. De

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belangrijkste conclusie van dit proefschrift is daarom dat er een sterke wetenschappelijke en maatschappelijke behoefte is om gezinnen met een lage SES actiever te betrekken bij ontwikkelingsonderzoek, om zodoende een beter inzicht te krijgen in de verbanden tussen de SES van ouders, psychosociale competenties van adolescenten en SES in de jongvolwassenheid. Dergelijke intensieve, langdurige samenwerkingen kunnen verder bijdragen aan het begrip van sociaaleconomische uitdagingen waarmee adolescenten te maken hebben, en kunnen leiden tot gepaste begeleiding voor een succesvolle overgang naar de jongvolwassenheid.

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CURRICULUM VITAE

Matthijs Fakkel – Ties for friends and family – was born in 1990 under the smoke of Den Haag. After graduating high school in Zoetermeer, he completed a bachelor's degree in Social Psychology from the Universiteit van Amsterdam in 2013. What followed was a two-year period of monastery life, traveling through India and Europe, and contemplating the purpose of life while striving to be of service to others.

With renewed enthusiasm, Ties obtained a research master's degree in Clinical and Health Psychology (*cum laude*) at Universiteit Leiden in 2018. A research internship (Erasmus MC/Sophia Kinderziekenhuis) on improving the transmission from youth to adult mental health care strongly shaped his personal vision on science and being a researcher. Right after, Ties started his PhD at Universiteit Utrecht, at the department of Interdisciplinary Social Science, on a project embedded in the Consortium of Individual Development. Besides reading, writing, and analyzing the socioeconomic (dis)continuity across generations and adolescent psychosocial competencies, he has been involved in teaching and developing courses, recruitment and data collection for numerous projects, and a wide variety of outreach and science communication activities.

Throughout his PhD, Ties was welcomed at several universities in the Netherlands and abroad, but also at several primary and secondary schools, neighborhood centers, sports clubs, and community events. Currently, Ties is employed as a post-doctoral researcher at the SYNC Lab (Erasmus University) to further his understanding of socioeconomic differences in adolescent self-control and future expectations through citizen science. As founder of Addendum, he also strives to make 'science tangible' for a majority of citizens, by offering creative science communication and outreach solutions. In the middle and long run, Ties plans to balance life between the Netherlands and India, university and monastery – expecting plenty of opportunities to further develop his own psychosocial competencies.

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SOCIOECONOMIC (DIS)CONTINUITY ACROSS GENERATIONS:

The role of adolescent behavioral control and social competence