



School-related Subjective Well-being of Children with and without Special Educational Needs in Inclusive Classrooms

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Abstract

Given the importance of schools as socializing institutions, a key dimension of children's subjective well-being (SWB) is their perception of school-related aspects. This study complements previous literature on various determinants of children's SWB by focusing on students with special educational needs (SEN). Due to academic challenges, stigmatization, and exclusion, they are at risk of experiencing reduced SWB. With the implementation of inclusive education around the globe, students with SEN are more frequently enrolled in regular schools, and a question arises regarding how students with SEN assess their school-related SWB in inclusive settings. Drawing on longitudinal data from the National Educational Panel Study in Germany (NEPS) we systematically investigate the effect of the SEN status on various facets of school-related SWB measured in Grade 4 of primary school. Applying a propensity score matching approach, we contrast children with SEN status to children without SEN status who are comparable in a rich set of observed confounding variables. We find that at the end of primary school, students with SEN report being less *satisfied with life in general*, being less *satisfied with school* and their *friends* than their comparable counterpart without SEN. Moreover, they experience more *tiredness* and feelings of *loneliness*, and show lower levels of *learning enjoyment* and *task mastering*. The potential mechanisms leading to lower school-related SWB are discussed.

Keywords Subjective well-being · Satisfaction · Emotions toward school · Special educational needs · Inclusive education · Primary education

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1 Introduction

Research on *subjective well-being* (SWB) is rooted in psychology and has increasingly been addressed in various academic disciplines (Diener et al., 1999). The vast body of scientific literature on this concept reveals a complex construct that has been defined in different ways (e.g., Keyes, 2006; Ryan & Deci, 2001; Ryff, 1989). In this paper, we draw on the hedonic definition of Diener et al. (1999), which states that SWB is the evaluation of an individual's life and emotional experiences. Accordingly, SWB is a multidimensional construct consisting of a cognitive and an affective component. The cognitive component is based on the judgments a person makes about her or his life. This includes satisfaction with both life in general and in relation to specific areas of life (Diener et al., 1999; Huebner, 2004; Migliorini et al., 2019). The affective component includes positive and negative emotions (Diener et al., 1999). High levels of satisfaction, frequent positive affections and/or infrequent negative affections indicate high SWB (Huebner, 2004).

Children's SWB has been receiving increasing amounts of attention in SWB research and is often seen as one dimension in a broader conception of children's well-being. There is a variety of definitions of children's well-being (for reviews, see Ben-Arieh, 2005, 2008; Casas, 2011; Pollard & Lee, 2003), which include both subjective and objective indicators in various domains, such as wealth, education, housing, family relations, or risk behavior, that significantly exceed the concept of SWB. However, there is a trend toward studying children from their own subjective perspective (Ben-Arieh, 2005, 2008; Casas, 2011). Although the definitions and conceptualizations of children's SWB are somewhat diverse, there is strong consensus regarding the relevance of SWB for health, learning, and developmental processes (Park, 2004). Particularly in child development, SWB is associated positively with school achievement and negatively with behavioral problems (Amholt et al., 2020; Kaya & Erdem, 2021; Vujčić et al., 2019). Moreover, higher levels of SWB can also serve as a resilience factor; for example, in terms of mitigating the effects of stress and negative experiences (Park, 2004). Thus, the determinants of children's SWB are of particular interest. Various studies have highlighted the role of age, gender, family background, peer relations, and school contexts as relevant determinants for children's SWB (e.g., Cho, 2018; Dinisman & Ben-Arieh, 2016; Huebner, 2004; Klocke et al., 2014; Rees & Bradshaw, 2018; Strózik et al., 2016; Tiliouine, 2014).

Schools represent an essential social environment and institutional context for children when growing up. Consequently, *school-related SWB* is a highly relevant aspect when studying children's SWB. School-related SWB serves as an indicator in the index of child well-being in Europe, listed next to life satisfaction and self-rated health (Bradshaw & Richardson, 2009). Similarly, Bradshaw et al. (2013) list subjective education, measured in terms of enjoying school and feeling pressured by schoolwork, as one SWB component. However, as suggested by Tian (2015), research on school-related SWB requires more comprehensive and specialized measures that cover both the cognitive and affective components that are clearly related to school.

Regarding the determinants of school-related SWB, one key result is that girls report higher levels of SWB than boys (Casas et al., 2013; Liu et al., 2016; McCoy & Banks, 2012; Migliorini et al., 2019; Strózik et al., 2016) and that school-related SWB tends to decrease with growing age (Casas et al., 2013; Liu et al., 2016; Park, 2004). Support received from classmates, friends and teachers increases school-related SWB whereas parental support does not (Liu et al., 2016; Tian et al., 2013; Tomás et al., 2020). Students who feel lonely, who are victims of bullying, and have academic difficulties, show lower levels of school-related SWB (Løhre et al., 2010; Tobia et al., 2019). These problems of academic difficulties (Gebhardt et al., 2015) and low levels of integration in the social networks at schools (Arishi et al., 2017) particularly exist for an already vulnerable group in the school system: students with special educational needs (SEN).

While students with SEN used to be placed in special schools in most countries, the inclusion of these students into regular classrooms has been a major political goal since the ratification of the UN Convention on the Rights of Persons with Disabilities (United Nations, 2006). Inclusive education aims to create optimal conditions for both learning and the socio-emotional development of all students (Ainscow & César, 2006). In particular, students' SWB is regarded as a central aspect of successful inclusive education (Terzi, 2014). Therefore, it is important to examine how the SEN status, as an external attribution, contributes to school-related SWB in inclusive primary school settings. Against this background, the present study poses the central research question: *What is the effect of the SEN label on school-related SWB?*

In Chapter 2, we explain the German context of the process of categorizing SEN. We also summarize, from a theoretical perspective, the potential positive and negative effects of the SEN label on school-related SWB, and the findings of previous empirical research on the topic. In Chapter 3, we highlight our research contribution. This is followed by a description of the data, variables and methods (Section 4), and results (Section 5), before we end with a discussion in Section 6.

2 Students with Special Educational Needs (SEN) and their Well-being

2.1 SEN categories and the processes of their identification in Germany

The practice of referring students to special needs categories exists in most countries, although the procedure, the category systems, and, consequently, the prevalence of SEN varies from country to country (Brussino, 2020). In Germany, eight special needs categories are defined: learning difficulties, social and emotional disorders, speech impairments, intellectual disabilities, hearing and visual impairments, and students with physical disabilities (KMK, 1994). Although special schools further exist in most federal states, students in all SEN categories are now eligible to attend a regular school. In the 2018/19 school year, 7.4% of all German students were assigned an SEN status, more than half of which were in the areas of learning difficulties, social and emotional disorders, and speech impairments. In the same

school year, 43.1% of these students were enrolled in regular schools, ranging from 28.9% in Bavaria to 88.5% in Bremen (Hollenbach-Biele & Klemm, 2020).

The various SEN categories lack a clear definition; that is, the process of SEN referral cannot be compared with psychological diagnostics, which follow scientific standards of objectivity, reliability, and validity. Moreover, overlaps between the different categories occur; in other words, students usually require special support concurrently in different areas. Therefore, even though a primary, most prevalent, category is assigned to the student on an administrative level, their special needs fit into more than one category.

The assessment of SEN is usually initiated by individuals (e.g., teachers, principals, parents) who must submit a formal request to the district government to initiate the identification process. If approved, a special needs teacher is sent to the school to assess the student. Although the process is rather institutionalized, the choice of testing methods and the content of the advisory report is at the discretion of the special needs teachers. The absence of precisely defined criteria regarding the diagnosis of SEN leads to some scope for interpretation with regard to the identification (Boyle, 2014). Thus, as various studies have found, the identification of students with SEN also depends on various factors such as students' academic achievement level (Hibel et al., 2010), teachers' characteristics (Smeets & Roeleveld, 2016), students' socioeconomic background (Hibel et al., 2010), school starting age (Dhuey & Lipscomb, 2010), and peer-group composition (McCoy et al., 2012). The regional prevalence of SEN also varies widely, both in Germany and beyond (Powell & Richardson, 2011). These factors need to be considered when attempting to isolate the effect of the SEN label itself on students with SEN, which is the aim of our empirical study.

2.2 Potential impacts of SEN labeling on well-being in school

From a theoretical perspective, being diagnosed with SEN may have positive and negative consequences for school-related SWB. Positive impacts on students' SWB can be assumed for students recognized as having learning or intellectual disabilities. This is because an adapted curriculum applies that relieves both the teachers and the corresponding students from performance pressures. A formal SEN status may also cause psychological relief in the children and their parents, given the indication that this status is limited in time and scope (Lauchlan & Boyle, 2007). Students with SEN may also be eligible to receive additional resources to support teaching and learning; for example, special needs teachers, teaching assistants or technologies (Norwich, 2014). Teachers may also become better aware of the various special needs, which allows creating appropriate learning provisions and directing additional support to children with SEN (Algraigray & Boyle, 2017; Arishi et al., 2017).

However, in practice, this additional support often fails due to limited resources, the inaccessibility of the mainstream curriculum, and the insufficient expertise of teachers in dealing with a variety of children with SEN (McCoy & Banks, 2012). For example, teachers in inclusive classrooms must implement specific teaching strategies to account for different levels of achievement, prior knowledge, and the

learning conditions of their students (Tomlinson, 2014). Using such diverse teaching strategies, such as differentiation, is a challenge and requires various professional skills, particularly regarding students with SEN (Deunk et al., 2015). Thus, didactic techniques may be implemented insufficiently, leading to a mismatch between the requirements of and assignments set by the teacher, and the abilities and learning conditions of students with SEN. This mismatch situation, in which teachers might demand either too much or too little from students with SEN, could influence school-related SWB. Moreover, despite the high degree of differentiation, the SEN categories may still not effectively reflect the individual needs of children with SEN (Arishi et al., 2017; Klibthong & Agbenyega, 2013).

Several studies have found empirical evidence that SEN categorizations are associated with certain risks (e.g., Algraigray & Boyle, 2017; Arishi et al., 2017; Boyle, 2014; Lauchlan & Boyle, 2007; Norwich, 2014). Critics of formal diagnoses generally refer to the deficit-oriented, classifying, and stigmatizing attributions of special needs categories (Algraigray & Boyle, 2017; Boyle, 2014; Lauchlan & Boyle, 2007). These potentially negative repercussions can be direct (i.e., at the level of the student) or indirect (e.g., at the level of classmates or teachers).

At the level of the teachers, the labeling can induce negative stereotyping. For example, in one of the few experimental studies on labeling effects, Gibbs and Elliott (2015) revealed that, for example, the label “dyslexia” compared to the use of the term “reading difficulties” has a negative impact on teachers’ level of perceived self-efficacy. A low level of perceived self-efficacy negatively influences the supportive actions taken by a teacher toward the respective student (Zee et al., 2016). In general, teachers’ negative stereotyping can induce greater risks of negative teacher-student relations (McCoy & Banks, 2012), and this is expected to translate into a lower level of school-related SWB of children with SEN.

At the level of the classmates, stigmatization and exclusion may be the cause of lower levels of social participation compared to their peers without SEN. For example, several studies have indicated that students with SEN have fewer friendships, are less accepted by peers, and are more likely to experience peer problems (Arishi et al., 2017; Koster et al., 2009; Schwab et al., 2015; Swift et al., 2021). Moreover, social inclusion is also linked to outcomes such as mental health and SWB (Guhn et al., 2012).

At the level of the students with SEN, the label has been shown to have negative impacts on their self-esteem and academic self-concept (e.g., MacMaster et al., 2002; Savolainen et al., 2018). As outlined above, this can be reinforced by mechanisms of stigmatization by teachers, social participation, and peers, which negatively impact students’ SWB in school (Gaspar et al., 2016).

In view of these arguments concerning the positive or negative effects of the SEN label on school-related SWB, the question arises: what is the empirical state-of-the-art in this regard? Whereas several studies have examined the effect of SEN on general measures of SWB, few have investigated the effect of SEN labeling on *school-related* SWB. Overall, these empirical studies have revealed a less favorable situation for students with SEN in relation to school-related SWB.

Using cross-sectional data from Austrian students in Grades 4 and 7, Schwab et al. (2015) compared the SWB of students both with and without SEN in inclusive

settings with the SWB of students without SEN in non-inclusive classrooms. Results indicated that neither the setting (inclusive vs. non-inclusive) nor the SEN status affected the students' school-related SWB, which is measured by emotional and social experiences at school. McCoy and Banks (2012) employed a cross-sectional regression design, using the first wave of the "Growing Up in Ireland" study, to examine whether 9-year-old Irish children with SEN enjoy school less than their peers without SEN. The identification of SEN was based on teachers' assessments. Adjusting for socio-economic background and gender, they found that SEN increases the probability of never liking school. This effect can be fully explained by adding measures of academic and social engagement as potential mediators into the model. Skrzypiec et al. (2016) used a bivariate associational analysis to investigate 13–15-year-old students in South Australia, and they found that students with self-reported SEN have lower levels of satisfaction with school, school connectedness, and feelings of support, as well as a higher level of bullying experience.

3 Research Contribution

Building on these important insights from these pioneering studies, our study complements the existing literature in various ways. First, we provide a comprehensive study of the effects of SEN on various aspects of school-related SWB. We examine different facets of the multidimensional construct of school-related SWB by focusing on positive and negative emotions regarding school context and satisfaction with school life at the end of primary school. The dimensions of general life satisfaction and satisfaction with social life are added in order to frame the findings within a broader body of research and to determine whether the domain-specific findings are also reflected in the overall satisfaction with life. Thus, as suggested by Tian (2015), we exceed the typical school satisfaction measures by also considering affective components to reach a comprehensive picture. Studying all aspects separately allows us to detect potentially differential influences on the various dimensions (Diener et al., 1999). All aspects of school-related SWB are assessed by the children themselves to capture their own subjective views and experiences (Ben-Arieh, 2008).

Second, we use a representative sample of primary school children in Germany to study the effect of SEN on school-related SWB. While most previous studies were focused on selective local samples, our results generalize to Germany. Germany represents an interesting case study due to the introduction of inclusive education in Germany in 2009, which allows us to compare children with SEN in regular classrooms to a statistically similar group of students without SEN. Given that students with SEN also attend the general school system, differences in school-related SWB can be attributed to the SEN label and not to differences in placement (special school vs. regular school). Another specific characteristic of our sample is the focus on primary school children, which can complement previous studies that focused on secondary school children. By studying primary school children, our study illuminates how inequality between children both with and without SEN may unfold during their early lives.

Third, whereas previous research mainly relied on cross-sectional data, we make use of the National Education Panel Study (NEPS; Blossfeld et al., 2011), which is a longitudinal data set representative for Germany. Unfortunately, we cannot fully exploit the panel data structure using within-estimators to eliminate unobserved heterogeneity (Brüderl & Ludwig, 2015) because there are no measures of well-being that have been collected prior to the diagnosis of SEN in a child. However, we make the most effective possible use of the longitudinal data structure by using the time structure of measurements to approximate the causal order of variables. We study the effect of being assigned the SEN label during primary school and use well-being measures from the end of primary school (in Grade 4) in order to investigate the longer-term impact of being labeled so. To account for confounding bias, we control for a rich set of variables, which were measured either prior to or at the beginning of primary education, when the child had not yet been influenced by a SEN status. Whereas most previous studies did not control for selection into SEN status, or adjusted only for basic background characteristics, the NEPS data allow us to account for differences across German federal states, gender, migration status, health, school readiness, social participation, and family background. The most significant advantage of NEPS data is that we are also able to adjust for pre-existing differences in competences because, the NEPS data provides longitudinal and multi-dimensional measurement of the competences of children that is based on objective and standardized tests (Weinert et al., 2011).

4 Data, Variables, and Methods

4.1 Data and Sample

This study draws on Starting Cohort 2¹ of the NEPS (Blossfeld et al., 2011), a longitudinal data set representative for Germany that comprises various context information, competence tests, and different measures regarding school-related SWB and satisfaction.

The selection of schools was random and based on the implicit stratification of schools according to federal states, regional classification (rural and urban), and organizing institution (private or public; Aßmann et al., 2011). Institutions and parents provided informed consent to participate voluntarily in the study. Surveys including parental interviews and students' competence testing occurred annually. Students' written questionnaires were issued at the end of primary school for the first time. Trained administrators from professional survey institutes conducted both

¹ This paper uses data from the National Educational Panel Study (NEPS): Starting Cohort Kindergarten, doi:<https://doi.org/10.5157/NEPS:SC2:8.0.1>. From 2008 to 2013, NEPS data was collected as part of the Framework Program for the Promotion of Empirical Educational Research funded by the German Federal Ministry of Education and Research (BMBF). As of 2014, NEPS is carried out by the Leibniz Institute for Educational Trajectories (LIfBi) at the University of Bamberg in cooperation with a nationwide network.

the surveys within schools as well as the computer-assisted telephone interviews with parents.

Our analytical sample includes participating students in Wave 6, in which the majority of the students attended Grade 4 of primary education. The measurement for the outcomes of interest was conducted in 2016 (see Section 4.2). Students with complete information on all control variables (see Section 4.4), the treatment variable and the respective outcome variable(s) are considered. For example, in the analysis of SEN status and satisfaction (see Section 5.2) the overall size of the analytical pre-matching sample is 4021, of which 202 students were assigned the SEN status before the end of primary school. The sample size is marginally different for other sets of outcome variables.

4.2 Treatment and Outcome Variables

4.2.1 Treatment variable: Binary indicator of Special Educational Needs

We use a binary indicator as our independent variable of interest (the “treatment variable”) because we are interested in the general effect of being assigned the SEN label during primary school. For our analysis, students are categorized as having SEN when their respective teacher indicated a diagnosis of any kind of SEN at some point during primary school. Due to the small overall number of SEN students, it is not possible to differentiate the timing and duration of having the SEN label. We therefore estimate the general effect of being categorized as having the SEN label during primary school. In our sample, 5% of the students have the SEN status, which corresponds to the nationwide proportion at the time (Autorengruppe Bildungsberichterstattung, 2016).

4.2.2 Outcome variables: Indicators of school-related subjective well-being

In our study, we use different indicators for children’s school-related SWB as outcome variables, which can be grouped into three dimensions: satisfaction, positive emotions toward school, and negative emotions toward school. Students responded to different items assessing their SWB at the end of primary school. In general, we refrain from merging the multiple indicators into overarching scales. This allows us to examine varying effects on single indicators, which provides us with in-depth insights into the multi-faceted consequences of SEN status on different emotions toward school (see Table 1 for an overview of indicators).

Satisfaction Rating one’s satisfaction is a commonly used indicator of the cognitive dimension of SWB (Diener et al., 1999). In the NEPS, it is assessed by questions on general life satisfaction, which represents a rather global measure (Huebner, 2004). Moreover, domain-specific satisfaction is assessed. In the context of school-related SWB, we choose both school and friendships as relevant life domains for our study. While overall satisfaction with life serves as a global indicator regarding SWB, school-related satisfaction provides a more direct insight into the students’

Table 1 Indicators of school-related subjective well-being

Satisfaction	Positive Emotions	Negative Emotions
How satisfied are you...		In my last school week...
... overall with your life?	I like going to school.	... I was tired and worn-out.
... with your friends?	I enjoy learning at school very much.	... I felt lonely.
... with school?	In my last school week, I mastered the tasks at school well.	... I was bored.
		... I was afraid.

school-related SWB. Satisfaction scales comprise a seven-point scale ranging from 1 to 7; higher scores indicate higher satisfaction with life or life domains.

Positive emotions toward school Items measuring positive emotions are taken from a German instrument on the social and emotional experiences of primary students in Grades 3 and 4 (Rauer and Schuck, 2003). It assesses the extent to which students associate school and its related tasks with positive emotions. Two indicators ask whether the child likes going to school and enjoys learning in school. Responses are measured on a four-point Likert scale (completely disagree, rather disagree, rather agree, completely agree), which we treat as a metric scale. Higher scores represent more positive emotions toward school in general and school-related learning. A third indicator focuses on mastering school-related tasks well. Responses are measured on a 5-point scale (never, seldom, sometimes, often, always), which we treat as a metric scale. Likewise, higher scores indicate a higher school-related SWB.

Negative emotions toward school Measurement of negative emotions is wide-ranging and includes various qualitatively different emotions (Ravens-Sieberer & Bullinger, 1998). Negative emotions are assessed in reference to the last school week and include, for example, boredom or anxiety. Responses are measured on a five-point scale (never, seldom, sometimes, often, always), which we treat as a metric scale. Lower scores indicate a lower level of negative emotions and therefore evidence of school-related SWB.

4.3 Method

We employ the method of propensity score matching to estimate the effect of SEN on the various measures of students' school-related SWB (Gangl, 2010). This method compares the SWB of students labeled with SEN with the SWB of otherwise similar students without SEN. This is accomplished by forming statistical twins that differ only in the SEN status but not in observed confounding variables (Gangl, 2015).

Statistical similarity is measured using the propensity score; that is, the probability of having a SEN status conditional on a set of observable control variables, which collapses the multiple control variables into one dimension. We estimate the

propensity score using a probit specification. This first step of matching is followed by the second step of using a matching algorithm to form statistical twins based on the propensity score as a measure of similarity. We have compared a variety of matching algorithms and chosen Epanechnikov kernel matching (bandwidth: 0.01) as it demonstrated highly effective balancing properties in relation to control variables. We also imposed a common support condition, which guarantees that there is an overlap in the range of propensity scores between the students with SEN status and those without. The outcomes of the treatment group and the matched control group are then compared to the matched individuals in weighted non-parametric mean comparison to estimate the average effect of having SEN status compared to the counterfactual situation of not having SEN status for the group of students with SEN status (termed the Average Treatment Effect of the Treated [ATT]). Standard errors were bootstrapped with 1000 repetitions because there are no analytical standard errors for kernel matching. Moreover, methodological research has indicated that bootstrapping performs effectively in cases of matching (Bodory et al., 2020). We performed all PSM analyses using the Stata ado *kmatch* (Jann, 2017).

As with regression analysis, the matching approach relies on a conditional independence assumption (CIA) that requires all confounding variables be considered. Although PSM relies on the same strict assumption of “selection on observables” as regression, it has some advantages. First, the non-parametric outcome estimation avoids misspecification errors. Second, matching guarantees a more appropriate weighting of covariates compared to linear regressions. Third, we impose the common support condition in matching, which avoids the problem in regression analyses of extrapolating into the region of “no common support;” that is, comparing non-comparable persons.

4.4 Control Variables

To make the CIA more plausible, we employ a rich set of control variables. We condition only on variables that are expected to affect both the SEN status and the school-related SWB variables in order to address confounding bias (Elwert & Winship, 2014; Rohrer, 2018). To avoid overcontrol bias, we do not control for any mediating variables in the causal relationship between SEN status and school-related SWB outcome variables because our interest is in the gross effect (Elwert & Winship, 2014; Rohrer, 2018). As a strategy to avoid overcontrol bias, we measure the control variables at the time of the interview in Grade 1; that is, at the beginning of primary school and before the treatment occurs.² The control variables we use were assessed by parents or institutions.

Within Germany, federalist decisions strongly guide the processes and criteria of diagnosis for SEN (Sälzer et al., 2015). Moreover, federal states differ substantially in school systems and context (Helbig & Nikolai, 2015), which may lead to

² In the very few cases when the specific information on the control variable is missing in Grade 1 interview but is available in other waves, we rely on the information in other waves. In this process we give priority to information gained in kindergarten, i.e. before the onset of primary school.

variations in students' school-related SWB. Thus, the federal state of the respective primary school is considered an important confounding factor that required controlling for by adding dummy variables for each federal state.

The NEPS data are unique in providing a longitudinal and multidimensional measurement of the competences of children. We make use of this special feature and include various competence measures as control variables. As with other variables, we use competence measures of Grade 1, which are supposed to be exogenous and—compared to later competence measures—are not yet affected by an SEN label. In contrast to school grades, performance in competence tests have the advantage of being an objective measure that is not affected by the subjective perceptions of teachers, parents or children (Heyder et al., 2017; Kaiser et al., 2013). Students' competences are of particular relevance for the diagnosis of SEN. Students with low achievement levels are often in need of additional support that is only granted along with the SEN label (Koster et al., 2009). Moreover, achievement outcomes are expected to influence school-related SWB (Amholt et al., 2020). Although results linking well-being in school to achievement are heterogeneous (e.g., Petegem et al., 2008; Putwain et al., 2019), positive emotions toward learning and school as a dimension of school-related SWB are highly interrelated (Konu & Rimpelä, 2002). Hence, we use different competence domains as control variables. In addition to the competence domains of math (Neumann et al., 2013) and science (Hahn et al., 2013), which are anchored in the school curriculum, we use two indicators for verbal abilities representing receptive vocabulary and grammar (Berendes et al., 2013). Competence estimates for math, science, and grammar are reported as weighted likelihood estimates (Warm, 1989) for each student. The indicators for receptive vocabulary are represented as the sum score of correct responses.

Further child characteristics that affect both SWB and SEN are included as matching variables (gender, indicators for health, and peer relationships). While boys are more often diagnosed with SEN (Kvande et al., 2018), they also report different levels of SWB compared to girls (Alivernini et al., 2019; Ignatjeva et al., 2019). Thus, gender has an influence on both SEN and well-being.

Early indicators of school readiness already predict multiple aspects of SWB in later school life (Putwain et al., 2019). However, school readiness is often less pronounced in children with SEN compared to students without impairments (Janus, 2011). To control for varying levels of school readiness in students, the age of school enrollment is included as a matching variable.

The relationship between health and SWB has been studied extensively (e.g., Tiliouine, 2014). Primary school students report higher levels of school-related SWB when they feel mentally healthy (Arslan & Allen, 2020). This implies health leads to less school-related SWB. Students with SEN have a higher incidence of poor health (Déry et al., 2004) indicating an association between health and SEN status. Thus, we use an indicator of students' health that includes the days of absence from school due to illness to control for variances in students' health.

Students with SEN are at particular risk with regard to social participation and establishing friendships (Koster et al., 2009). Negative peer relationships are associated with lower levels of SWB (Guhn et al., 2012). As stigmatization by peers is one of the assumed causal mechanisms regarding how SEN labeling affects

school-related SWB, it is important to disentangle the causal mechanism from spurious components. This is undertaken by accounting for pre-existing levels of social relationships before the SEN labeling comes into play. We use an indicator for peer relationships that refers to the frequency of playing outside with friends at the beginning of primary education as a matching variable.

Further, we consider various dimensions of the background information of the children and their families. The families of students with SEN often have migration backgrounds, lower socio-economic status, or a lack of educational attainment (Bos et al., 2010; Kvande et al., 2018). Furthermore, previous findings highlight that living conditions and family background matter for childrens' SWB (Alivernini, et al., 2019; McCoy & Banks, 2012). Thus, family-related matching variables refer to students' situations at home. Information includes single-parent family (dummy coded), socio-economic background, level of education, and migration background. Socio-economic background is measured by using the highest index of occupational status (ISEI, Ganzeboom et al., 1992) within the family. The variable "years of parents' education" indicates the educational level within the family. Migration background is operationalized by using generational status as a binary indicator. It distinguishes between students who have a migration background and ranges from first generation (student born abroad and immigrated to Germany) to third generation (student and parents born in Germany, two grandparents born abroad; Olczyk et al., 2016).

5 Results

5.1 Descriptive Statistics and Balancing of Control Variables

Table 2 indicates the balancing of control variables before and after matching. Results are presented for the "life satisfaction" outcome variable as balancing properties are similar for other outcome variables. The unmatched comparison also provides statistics describing the composition of our treatment and control groups.

The figures provided in Table 2 can be interpreted in the following way, as illustrated based on the example of the control variables "female" (dummy variable) and "years of parents' education" (continuous variable). Before matching, 34.0% of the students with SEN status are female compared to 51.8% of the students without SEN status. This results in a mean standardized bias of -36.5% . Via matching, this difference is substantially reduced to a mean standardized bias of 3.0% as the matched control group has an almost equal share of women (33.2%) compared to the treatment group (34.7%). The figures provided for "years of parental education" in the first two columns refer to the mean years of parental education, which is much higher in the unmatched control group (15.0 years) than in the treatment group (14.0 years). Matching succeeds in balancing this covariate as the matched control group has an average age of 14.1 years. Again, the mean standardized bias substantially declines in absolute terms from -40.7% to -1.5% . Balancing is not only improved in mean values but also in the variances of the continuous variable "years of parents' education." The variance ratio changes from 1.3 to 1.2, with 1.0 representing an equal variance in the control variable for both groups. Overall, the matching algorithm we

Table 2 Balancing of control variables before and after matching

	Before Matching				After Matching			
	Mean Treated (SEN)	Mean Controls (not SEN)	% bias	VR	Mean Treated (SEN)	Mean Controls (not SEN)	% bias	VR
Female	0.340	0.518	-36.5		0.347	0.332	3.0	
Migrant	0.345	0.239	23.4		0.347	0.343	0.7	
Parental years of education	14.014	15.024	-40.7	1.3	14.060	14.097	-1.5	1.2
Parental ISEI	51.342	58.860	-36.3	1.2	51.749	52.183	-2.1	1.0
Parents together	0.777	0.824	-11.9		0.782	0.773	2.2	
Age at school entry	6.530	6.421	24.6	1.0	6.519	6.520	-0.3	1.1
Playing ≥ 1 times per day	0.447	0.514	-13.5		0.455	0.444	2.2	
Playing ≥ 1 times per week	0.437	0.374	12.8		0.426	0.442	-3.2	
Playing < 1 time per peek	0.117	0.112	1.3		0.119	0.114	1.5	
Days of sick leave	0.665	0.496	10.6	1.1	0.649	0.613	2.2	1.2
Days of sick leave, squared ^{a)}	3.000	2.695	1.7		2.965	2.459	2.8	
Competence: Vocabulary	35.102	41.569	-65.1	1.3	35.460	35.499	-0.4	1.0
Competence: Grammar	1.103	1.889	-69.0	1.0	1.120	1.160	-3.0	1.2
Competence: Math	-0.681	0.117	-50.5	0.4	-0.669	-0.631	-2.4	0.9
Competence: Math, squared ^{a)}	1.740	3.725	-3.4		1.728	1.883	-0.3	
Competence: Natural science	-0.374	0.136	-57.2	1.0	-0.373	-0.340	-3.7	1.1
Schleswig-Holstein	0.039	0.046	-3.6		0.039	0.039	0.3	
Hamburg	0.005	0.016	-11.1		0.005	0.005	0.2	
Lower Saxony	0.117	0.123	-1.9		0.119	0.112	2.1	
Bremen	0.000	0.008	-12.5		0.000	0.000	0.0	
North Rhine-Westphalia	0.199	0.240	-9.9		0.203	0.199	0.9	
Hesse	0.058	0.066	-3.2		0.059	0.061	-0.7	
Rhineland-Palatinate	0.063	0.054	3.8		0.064	0.073	-3.5	
Baden-Wuerttemberg	0.189	0.113	21.3		0.183	0.174	2.7	
Bavaria	0.223	0.186	9.1		0.223	0.237	-3.6	
Saarland	0.010	0.008	2.2		0.010	0.009	0.5	
Berlin	0.010	0.033	-16.0		0.010	0.012	-1.7	
Brandenburg	0.010	0.014	4.2		0.010	0.009	1.3	
Mecklenburg-Western Pomerania	0.039	0.017	13.5		0.035	0.035	0.0	
Saxony	0.019	0.041	-12.5		0.020	0.018	1.2	
Saxony-Anhalt	0.015	0.017	-2.3		0.015	0.012	1.9	
Thuringia	0.005	0.017	-12.0		0.005	0.005	0.0	
<i>N</i>	206	4072			202 ^{b)}	3883 ^{c)}		

NEPS SC2 2011–2016. Own calculations. % bias denotes the standardized percentage bias, defined for each control variable as the difference in means divided by the square root of the average of the variances of the treated and the controls. The variance ratio (VR) is defined for continuous control variables as the ratio of the variance of the treated and the controls

^{a)}The variables *days of sick leave* and *math competence* were entered in linear and squared terms to reach a better balancing of these control variables

^{b)}4 treated excluded after matching due to no common support

^{c)}189 controls excluded after matching due to no common support

chose is quite successful in terms of reducing the mean standardized bias below the threshold of 5 for each control variable, resulting in a variance ratio for the continuous variables that is relatively close to 1.0 (Gangl, 2015).

In general, the results reveal that the unmatched treatment and control groups differ substantially in terms of important confounding factors. In the following section, we briefly mention the most striking differences. On average, students with SEN are more likely to be boys from a migration background who live in families with lower parental educational and occupational status backgrounds. Students with SEN are also older when entering school for the first time and have more days of absence from school. Strong differences are also observed in terms of the various competence tests set at the beginning of primary education. Students with SEN perform worse in all the competence tests considered: vocabulary, grammar, math, and natural science. There are also small differences in the prevalence of students with SEN across the different German federal states Table 3.

5.2 Results on Satisfaction

We investigated the satisfaction of life and two life domains (friends and school). Overall, the satisfaction with life overall was very high but students with SEN score lower. Whereas students with SEN status report an average life satisfaction of 5.93, the average level of life satisfaction reaches 6.13 among the matched control group of students without SEN. The difference yields the ATT, which is -0.20 . The effect is statistically significant on the 10% level ($p=0.074$).

Table 3 SEN status and satisfaction, results from the second stage of PSM

	Coefficient	Bootstrapped s.e.	Z-statistics	P value ($P > z $)
<i>Life satisfaction</i>				
Mean outcome treated	5.93			
Mean outcome matched controls	6.13			
ATT	-0.20	0.11	-1.79	0.074
<i>Satisfaction with friends</i>				
Mean outcome treated	6.04			
Mean outcome matched controls	6.24			
ATT	-0.20	0.11	-1.85	0.065
<i>Satisfaction with school</i>				
Mean outcome treated	4.87			
Mean outcome matched controls	5.16			
ATT	-0.29	0.16	-1.82	0.069

NEPS SC2 2011–2016. Own calculations. ATT = Average Treatment Effect on the Treated s.e. = standard error. $N(\text{treated})=202$, $N(\text{controls})=3819$. 3 treated and 182 controls excluded after matching due to no common support

Satisfaction with friends also reaches high levels in general. Again, students with SEN status report a lower level of satisfaction (6.04) compared to the matched control group of students without SEN status (6.24). The estimated ATT is -0.20 , which is of similar size as the ATT for the outcome variable life satisfaction. The ATT for the satisfaction with friends reaches a statistical significance level of 10% ($p=0.065$).

Satisfaction with school in general is less strongly pronounced than overall life satisfaction and satisfaction with friends. Students with SEN report only an average level of satisfaction (4.87), whereas the matched control group of students without SEN report a higher level of satisfaction with school (5.16). The difference yields the ATT, which is -0.29 , and hence of similar size compared to the two other satisfaction variables. The effect is statistically significant on the 10% level ($p=0.069$).

Thus, we find that obtaining the SEN label decreases general life satisfaction in addition to satisfaction with friends and school.

5.3 Results on Negative Emotions Toward School

We analyzed four indicators of children's negative feelings during their last school week (see Table 4). The indicators were measured on a five-point scale ranging from 1 to 5. Students with SEN status reported an average score of 2.78 on the dimension of being tired and worn-out during a school week. This is higher than the average

Table 4 SEN status and negative emotion toward school, results from the second stage of PSM

	Coefficient	Bootstrapped s.e.	Z-statistics	P value ($P > z $)
<i>Tired and worn-out</i>				
Mean outcome treated	2.78			
Mean outcome matched controls	2.58			
ATT	0.20	0.12	1.69	0.092
<i>Lonely</i>				
Mean outcome treated	2.07			
Mean outcome matched controls	1.83			
ATT	0.25	0.11	2.17	0.030
<i>Bored</i>				
Mean outcome treated	2.67			
Mean outcome matched controls	2.63			
ATT	0.03	0.12	0.29	0.771
<i>Afraid</i>				
Mean outcome treated	1.57			
Mean outcome matched controls	1.48			
ATT	0.09	0.90	1.01	0.311

NEPS SC2 2011–2016. Own calculations. ATT = Average Treatment Effect on the Treated s.e. = standard error. $N(\text{treated}) = 189$, $N(\text{controls}) = 3662$. 4 treated and 236 controls excluded after matching due to no common support

value of 2.58, which is reached by the matched control group of students without SEN status. The ATT is 0.20 and statistically significant at the 10% level ($p=0.091$).

A smaller share of students report feeling lonely during their last school week. However, again, students with SEN report a higher incidence of the negative emotion of loneliness, reaching, on average, a score of 2.07 compared to 1.83 for the matched group of students without SEN status. The ATT is 0.25 and statistically significant at the 5% level ($p=0.030$).

In contrast, there are no substantial and no statistically significant differences between the two groups in relation to the two other SWB indicators. The average score of students who were bored during their last school week was 2.67 for the students with SEN and 2.63 for the matched control group, which yields an ATT of just 0.03 ($p=0.771$). On average, the score of being afraid during the last school week was lowest among all the SWB indicators assessing negative emotions toward school that we considered. The mean value of the indicator is just 1.57 for students with SEN and 1.48 for the matched control group. The ATT is only 0.09 and statistically insignificant ($p=0.311$).

5.4 Results on Positive Emotions Toward School

We analyzed four indicators of children's positive emotions in relation to school-related SWB (see Table 5). The first two indicators were measured on a four-point scale ranging from 1 to 4. On average, students with SEN status agreed less with the statement that they like going to school (2.59) than the matched control group of students without SEN status (2.70). However, the ATT of -0.10 is not statistically significant ($p=0.277$).

Table 5 SEN status and positive emotions toward school, results from the second stage of PSM

	Coefficient	Bootstrapped s.e.	Z-statistics	P value ($P > z $)
<i>Like going to school</i>				
Mean outcome treated	2.59			
Mean outcome matched controls	2.70			
ATT	-0.10	0.10	-1.09	0.277
<i>Enjoy learning in school</i>				
Mean outcome treated	2.54			
Mean outcome matched controls	2.76			
ATT	-0.22	0.09	-2.35	0.019
<i>Mastering tasks at school well</i>				
Mean outcome treated	3.49			
Mean outcome matched controls	3.83			
ATT	-0.34	0.11	-3.19	0.001

NEPS SC2 2011–2016. Own calculations. ATT = Average Treatment Effect on the Treated s.e. = standard error. $N(\text{treated}) = 198$, $N(\text{controls}) = 3754$. 4 treated and 196 controls excluded after matching due to no common support

However, there is a clear difference with regard to the statement concerning whether students enjoy learning in school. Students with SEN reached a mean value of 2.54 on this indicator compared to 2.76 for the matched control group. This gives a negative ATT of -0.22 , which is also statistically significant at the 5% level ($p=0.019$). Likewise, there is a negative effect of the SEN status when students were asked whether they mastered tasks at school well during the last school week. This indicator is measured on a five-point scale and is therefore not directly comparable to the other two indicators. The average value of this indicator is 3.49 for the students with SEN and 3.83 for the matched control group of students without SEN status. The negative ATT of -0.34 is statistically significant at the 1% level ($p=0.001$).

6 Discussion

This study aimed to explore the impact of an identified SEN status in primary school students in relation to different dimensions of school-related SWB. Whereas previous studies focused on differences in SWB between students with and without SEN, our study is the first to investigate the effect of the SEN label on students' school-related SWB. We used data from the representative NEPS to investigate this effect. To this end, we employed a propensity score matching design to correct for non-random selection into SEN status based on observed variables. The longitudinal data set allowed for matching based on a rich set of observed confounding variables (e.g., competences, health, and family background), which were measured before students received the SEN status. Outcome measures on school-related SWB were measured at the end of primary school, which provides insights into the longer-term impact of being labeled with SEN in primary school. The measurement of the outcomes included different indicators on satisfaction as well as negative and positive emotions toward school.

The comparison of statistical twins with and without SEN reveals a multi-faceted and diverse picture. Although positive impacts of the SEN status on SWB are theoretically substantiated (e.g., in terms of additional resources and increasing teacher awareness), the study does not point to any statistically significant positive effects of the SEN label on school-related SWB. However, the results of this study reveal statistically significant negative effects of the label for some outcome measures.

Specifically, students with SEN feel less *satisfied with life in general* but also with respect to *friends* and *school*. Our finding of lower satisfaction with social life relates to previous findings revealing that students with SEN are less integrated into social networks within class, and have fewer friendships (e.g., Koster et al., 2009; Schwab et al., 2015). In line with this, our study indicates that students with SEN experience more feelings of *loneliness*. Hence, our findings raise the question of whether this is, to some extent, attributable to the label, possibly as a result of stigmatization processes and negative attitudes toward students with SEN (Algraigray & Boyle, 2017).

Furthermore, while no difference was found for feelings of *boredom* and *anxiety*, students with SEN indicate higher levels of *tiredness* and *being worn-out* within

school. One reason for this could be that they may be experiencing higher levels of stress at school; for example, with regard to their comparatively less stable social relationships. They may be even subjected to bullying and victimization, which may lead to feelings of being worn-out. Nevertheless, it is important to note that feelings of *anxiety* are not higher for students with SEN; that is, potential risks of stigmatization (Algraigray & Boyle, 2017; Boyle, 2014; Lauchlan & Boyle, 2007) do not lead to being more afraid than students without the SEN label. Since anxiety is associated with a higher risk of school drop-out (Duchesne et al., 2008), this finding is crucial for a group of students that is already at risk.

Regarding positive emotions toward school, it can be concluded that these feelings are less pronounced in students with SEN status. Students with SEN report lower levels of *enjoyment in learning* and *mastering tasks well* in comparison to the matched control group. This could originate in a lower academic self-concept (Algraigray & Boyle, 2017; MacMaster et al., 2002; Savolainen et al., 2018), bearing in mind that the label can lead to lower self-esteem and stereotype threat effects (e.g., Wilbert 2010). However, their individual learning conditions are also relevant in this context; for example, because their prior knowledge may not be adequately considered in class. To achieve learning progress, task requirements should be neither over- nor under-demanding (Deunk et al., 2015). Task selection by teachers may not be optimal and assignments may lack an appropriate balance between ability and challenge. In addition, it is possible that teachers perceive students with SEN differently and thus treat them differently due to lower expectations (Algraigray & Boyle, 2017) and a decreased level of self-efficacy toward students labeled with SEN (cf. Zee et al. 2016). Finally, it is interesting to note that no effect was found for the indicator “*I like going to school,*” whereas students with SEN reported significantly lower levels of *satisfaction with school*. This might be explained by the fact that satisfaction is related to the cognitive component of SWB, while “*I like going to school*” reflects the affective dimension of the construct.

To sum up, no positive effects resulting from SEN status on school-related SWB were found in our study. Furthermore, specific negative effects regarding the learning and social dimensions of SWB were evident. Students with SEN are less satisfied with their friends and feel lonelier at school. In addition, they enjoy learning less and perceive that they master tasks less effectively than comparable peers without SEN status. These circumstances seem to lead to reduced satisfaction with school in general, which we also found in our study.

6.1 Limitations

The present study uses a large and representative sample of primary school students in Germany and draws on a rich data set that provides considerable information on child and family characteristics over an extended period. Nevertheless, there are limitations. Although the overall sample size is rather large and a representative share of students with SEN is included (Autorengruppe Bildungsberichterstattung 2016), the total number of the students with SEN included in the study is rather small. Thus, it is not possible to further differentiate between

different categories of SEN (cognitive, physical or sensory) or the timing and duration of exhibiting SEN.

The rich and longitudinal data set of the NEPS allows controlling for many relevant observed confounding variables. All of these are assessed before receiving the treatment (SEN status) to reduce overcontrol (Elwert & Winship, 2014; Rohrer, 2018). However, we cannot rule out that further unobserved or unconsidered confounding variables may have an influence on the SEN status and our outcome variables. Moreover, the data does not include earlier measures of school-related SWB at the beginning of primary school and thus before treatment, which would allow us to implement a strict longitudinal design and applying within-estimators. Accordingly, our findings should be treated with caution from a causal perspective, as confounding bias might be present due to unobserved variables.

6.2 Implications

With the ratification of the UN Convention (United Nations, 2006), inclusive education has become a human right. The signatory states are committed to implementing a high-quality, inclusive school system at all levels. Students' SWB is a central outcome variable that is closely associated with successful educational trajectories. In this context, the practice of status diagnostics is questionable. While official SEN labeling is still necessary to provide students with the assistance and resources they require, it can lead to negative effects with respect to different dimensions of school-related SWB. Consequently, the process of labeling must be questioned politically as well as pedagogically. In line with the idea of an inclusive education system, a basic provision of resources (special education teachers, qualified regular teachers, materials, etc.) should be made available for every school; that is, the allocation of resources has to be disentangled from individual labels (Goldan, 2019). This would also prevent unintended effects, such as stigmatization, for individuals.

Finally, in order to counteract processes of stigmatization and reduced SWB within school, future research should examine the mediators that lead to a decreased level of SWB that can be rooted in the SEN label itself.

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Declarations

Conflicts of Interest/Competing Interests The authors declare that there is no conflict of interest.

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