

Blanck, Jonna M.; Menze, Laura; Nusser, Lena

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# Subjective well-being in early adulthood—long-term consequences of inclusive vs. segregated education for students with special educational needs in Germany?

Jonna M. Blanck <sup>a</sup>, Laura Menze <sup>b,c</sup> and Lena Nusser <sup>d</sup>

<sup>a</sup>Department of Rehabilitation Sciences, Humboldt-University of Berlin, Berlin, Germany; <sup>b</sup>Research Group National Educational Panel Study: Vocational Training and Lifelong Learning, WZB Berlin Social Science Center, Berlin, Germany; <sup>c</sup>Research Data Centre, Federal Institute for Occupational Safety and Health (BAuA), Berlin, Germany; <sup>d</sup>Competencies, Personality, Learning Environments, Leibniz Institute for Educational Trajectories (LifBi), Bamberg, Germany

## ABSTRACT

We analysed the long-term consequences of inclusive versus segregated educational settings for students with special educational needs in the area of learning (SEN-L, formerly ‘learning disability’) in Germany. We focused on the consequences of educational settings on subjective well-being (SWB) measured as general life satisfaction five to six years after leaving a mainstream or a special school. We accounted for the selection of students into the different educational settings based on a variety of individual and socio-demographic characteristics. To this end, we conducted entropy balancing and controlled for the current status of not being in education, employment or training (NEET). Young adults who formerly attended segregated special schools reported on average slightly lower levels of life satisfaction. They were also at a much higher risk of being excluded from post-secondary education and the labour market at the age of 20 to 21. However, the differences in life satisfaction were not significant when accounting for systematic differences in individual and socio-demographic characteristics between the two groups. This finding highlights the importance of considering the selection mechanisms underlying educational settings in analyses of outcomes of students with SEN. Their current NEET status did not explain differences in life satisfaction by educational setting.

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Subjective well-being; life satisfaction; special schools; special educational needs; inclusive education; Germany

## Introduction

By ratifying the UN-Convention on the Rights of Persons with Disabilities (UN-CRPD), many countries have agreed to guarantee access to inclusive education to all students in school and beyond. Thus, inclusive education is on the rise around the globe (Schwab 2020). Yet, countries differ substantially with respect to the access they grant students with special educational needs (SEN) to mainstream classrooms, and in some countries

**CONTACT** Jonna M. Blanck  [jonna.blanck@hu-berlin.de](mailto:jonna.blanck@hu-berlin.de)

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students with SEN are still enrolled in segregated special schools (Richardson and Powell 2011).

These developments are accompanied by ongoing debates about the advantages and disadvantages of inclusive and segregated educational settings (e.g. Rea, McLaughlin, and Walther-Thomas 2002; Reeves et al. 2022). In modern societies, the role of education goes beyond individual competence development and formation of human capital. Education fulfils important socialising functions. Therefore, in addition to academic outcomes, the socio-emotional outcomes of schooling are particularly important (Rutter 1991). So far, the debate about the (dis)advantages of inclusive versus segregated educational settings for students with SEN has focussed on short-term consequences, with researchers mainly investigating academic and socio-emotional outcomes *during school* (e.g. Ruijs and Peetsma 2009). While this research shows disadvantages in terms of academic achievement for students with SEN in segregated educational settings compared to those in inclusive settings (e.g. Myklebust 2007), findings on how the educational setting impacts the socio-emotional outcomes of students with SEN are inconsistent (McCoy and Banks 2012; Ruijs and Peetsma 2009).

Much less attention has been devoted to the (*long-term*) *consequences* of educational settings for the outcomes of students with SEN *after they leave school*. Existing literature suggests that inclusive education is beneficial for the post-school educational attainment and labour market integration of students with SEN (e.g. Båtevik and Myklebust 2006; Blanck 2020; Haber et al. 2016; Mazzotti et al. 2021; Rojewski, Lee, and Gregg 2015; Test et al. 2009). However, thus far, there have been no investigations on the potential long-term consequences of the educational setting on the *socio-emotional outcomes* of students with SEN after leaving school.

We want to contribute to the outlined research gap by analysing the long-term consequences of inclusive versus segregated educational settings for students with SEN *after they leave school*. We complement existing research on the consequences of educational settings on post-school educational and labour market outcomes by directing our attention to the socio-emotional outcomes of former students with SEN in young adulthood. More specifically, we focus on young peoples' *subjective well-being* (SWB), which social production function theory stresses as an 'ultimate goal' and a central factor for social cohesion (Ormel et al. 1999). SWB is often assessed via life satisfaction (Diener et al. 1999).

Life course research has revealed lower levels of SWB in adulthood for less-educated groups and persons with disabilities (Hadjar and Kotitschke 2021; Kratz and Patzina 2020). As former students with SEN tend to have a low level of formal education (Shandra and Hogan 2009), they are likely to be at particular risk regarding SWB. We aim to analyse the consequences of inclusive versus segregated educational settings on the SWB of former students with SEN in early adulthood. Since it has been shown that labour market integration affects SWB (Foubert, Levecque, and van Rossem 2017) and that the labour market integration of youth with SEN is highly affected by inclusive and segregated settings, we also consider whether the former students with SEN are currently not in education, employment or training (NEET).

We focus on Germany, which can be seen as a strong example of educational segregation in international comparison, with a high share of students with SEN attending segregated educational settings. Our analyses are based on rare longitudinal data from

the German National Educational Panel Study (NEPS; Blossfeld and Roßbach 2019) which allow us to compare former students classified as having SEN in the area of learning (SEN-L) from segregated and inclusive educational settings. Using entropy balancing to render the two groups comparable regarding a wide range of observable characteristics (including cognitive skills), we aim to analyse the effect of the educational setting on general life satisfaction in early adulthood (i.e. at age 20/21).

## Special needs education and school-to-work transitions in Germany

The German school system is highly stratified. In addition to early student selection into different tracks in the mainstream school system, a segregated special school system continues to exist – albeit to a varying extent across the German federal states.

Over the past two decades, there has been a slow but steady increase in the number of students with SEN in Germany due to an increase in the percentage of students in mainstream schools who are labelled as having SEN. At the same time, the number of students educated in segregated special schools has remained fairly stable in most of the German federal states. In the secondary education system, inclusive education is mostly offered in the lower secondary track (*Hauptschule*) and in comprehensive schools (e.g. *Gesamtschule*). The organisational forms of inclusive education vary highly between states and schools including, for example, special classes within mainstream schools or inclusion of students with SEN in regular classrooms (Schwab 2020).

Officially, eight types of special needs and corresponding special schools can be distinguished. The largest group of students with SEN in Germany is made up of students classified as having SEN in the area of learning (SEN-L; Gebhardt et al. 2011). SEN-L is defined as not achieving the learning goals set by the regular curriculum (Powell and Pfahl 2019). To this day, intelligence testing is a crucial part of the diagnostic procedures for SEN-L in many federal states, because SEN-L is mainly understood as low cognitive ability, hindering the acquisition of educationally relevant competences (Lloyd, Keller, and Hung 2007). Boys, students with a migration background and students from families living in poverty or with a low socio-economic status are disproportionately more often classified as having SEN-L. Also, there are significant differences between students with SEN-L in inclusive and segregated educational settings with respect to their social background, cognitive skills and social behaviour. Students in special schools tend to be more disadvantaged in these dimensions (Gebhardt et al. 2015; Kvande, Belsky, and Wichstrøm 2018; Schwab et al. 2016).

These differences indicate the existence of selection mechanisms with respect to the enrolment of students with SEN in inclusive or segregated educational settings (Kvande, Belsky, and Wichstrøm 2018). A number of factors may influence these selection mechanisms. For instance, parents with higher levels of affluency and education tend to select a higher school track for their children in comparison to parents with lower levels of educational attainment (Reisel 2011). In the context of special educational needs, the selection of a higher school track would lead to parents selecting an inclusive mainstream school rather than a segregated special school. Moreover, the selection mechanisms can also be attributed to the attitudes of teachers and their biased judgements of students from families with a low socio-economic status (Sorhagen 2013).

Students with SEN-L usually leave school after Grade 9 or 10 (i.e. at the ages of 15 to 16). After school, the pedagogical SEN-L classification is no longer effective. However, institutional classification processes within the Federal Employment Agency may result in SEN-L labels being translated into disability labels based on definitions codified in the German Social Security Laws (*Sozialgesetzbuch*) to allow individuals access to vocational rehabilitation programmes. Generally, former students from segregated educational settings are disadvantaged in their access to vocational training (VET; Blanck 2020; Holtmann, Menze, and Solga 2023), resulting in an increased long-term risk of exclusion from the labour market compared to low-attaining youth from mainstream schools (Menze, Solga, and Pollak 2023).

### Previous research on subjective well-being

SWB and life satisfaction are subject to various intra-individual changes over the life course (Dietrich et al. 2022; Switek and Easterlin 2018; Wunder et al. 2013). Their levels and changes over time depend on individual characteristics and life events (Keyes 2006).

Persons with lower education exhibit lower levels of life satisfaction. This inequality rises over the life course (Kratz and Patzina 2020). Most studies find that boys report higher levels of life satisfaction (Dietrich et al. 2022). Life satisfaction or SWB among people with a migration background can differ widely depending on various factors (e.g. country of origin; Obućina 2013). Furthermore, the living conditions of children and their family background influence children's SWB (Alivernini et al. 2019). The family's resources, parents' educational background and the family constellation continue to affect SWB in young adulthood (Louis and Zhao 2002). Differences in the level of SWB and life satisfaction are associated with cognitive skills (Amholt et al. 2020), non-cognitive skills such as self-esteem (Salmela-Aro and Tuominen-Soini 2010) and self-efficacy (Proctor, Linley, and Maltby 2009).

Furthermore, transitions in the life course affect SWB. Leaving school and entering VET, further education or employment positively affect SWB (Reuter et al. 2022; Siembab and Stawarz 2019). Experiences of inactivity and particularly unemployment negatively influence SWB (Proctor, Linley, and Maltby 2009).

Students with and without SEN differ with regard to SWB and school-related socio-emotional outcomes early on in their school career (Goldan, Nusser, and Gebel 2022). However, the findings on the SWB of adolescents or young adults with a former SEN label remain scarce (Savage et al. 2014; exception, e.g.; Milton and Sims 2016). Research on the adult population shows that disability is negatively associated with SWB and that unemployment also negatively affects the SWB levels of persons with disabilities (Foubert, Levecque, and van Rossem 2017; Hadjar and Kotitschke 2021; van Campen and van Santvoort 2013).

Only recently, SWB has received more attention as an outcome of school-related characteristics. For instance, evidence for Germany shows that students in higher school tracks have a higher initial level of life satisfaction, but experience a stronger decrease in life satisfaction over time compared to students in lower school tracks. The life satisfaction of students from different tracks seems to equal out in Grade 10 (Herke, Rathmann, and Richter 2019).

Previous research has yielded varying results on how inclusive educational settings impact the socio-emotional outcomes of students with SEN who are still in school (Dell'anna et al. 2022). However, many studies on the effects of inclusive education are carried out without a comparison group in segregated education, leaving the question open as to whether differences in socio-emotional outcomes result from the educational setting or from selection processes (for an overview, see Ruijs and Peetsma 2009). Only very few studies have investigated the consequences of educational settings specifically on the SWB of students with SEN (Proctor, Linley, and Maltby 2009). For Germany, only one study has compared students with SEN in special and mainstream schools, finding that attendance of a segregated special school has a positive effect on SWB. Herke, Rathmann, and Richter (2018) showed that students of Grades 6 through 8 with SEN-L in special schools were more satisfied with their life than students with and without SEN-L in mainstream schools. Students with SEN-L in mainstream schools, as an inclusive educational setting, exhibited the lowest life satisfaction. However, over time, their life satisfaction levels became more similar to those of their peers without SEN in mainstream schools. To our knowledge, no previous study has explored the long-term consequences of inclusive versus segregated educational settings on the SWB of students with SEN after they leave school.

### Theoretical expectations

Proponents of segregated educational settings argue that special schools are favourable for students with SEN because more homogenous groups are beneficial for students' academic self-concepts and SWB in broader terms. This assumption is based on theories related to reference group effects, according to which students compare themselves to their peers (e.g. classmates) to evaluate and define themselves (van Houtte, Demanet, and Stevens 2012). Such theories have led researchers and policymakers to conclude that educational tracking is particularly beneficial for low-achieving students because their reference group is more similar to them and does not pose a threat to their self-evaluation. In line with this, it has also been argued that special schools could function as a 'safe space' for students with SEN who are more likely to be bullied (Chatzitheochari, Parsons, and Platt 2016) and socially isolated (Schwab 2015) in mainstream schools, which can be expected to affect their SWB. Against this background, it can be argued that positive experiences during school in segregated educational settings may endure after school and positively affect subsequent life satisfaction.

On the other hand, studies have highlighted the relevance of stigma processes for the life courses of persons with disabilities. Link and Phelan (2001, 367), conceptualise stigma as a social process involving 'labeling, stereotyping, separation, status loss, and discrimination' in a situation where power is exercised. Especially the label SEN-L, which (in Germany) is used synonymously with the historical term 'learning disability', is related to negative stereotypes such as being 'stupid'. Qualitative studies have demonstrated long-term consequences on the social identity of labelled students (Powell and Pfahl 2019).

However, (Goffman 2006, 132) distinguishes between persons who are discredited because their stigma 'is evident on the spot' and those who are discreditable because their stigma is not immediately visible. While being labelled as SEN in a mainstream

school is not necessarily visible as a discrediting characteristic, attending a special school makes it immediately apparent to others. Therefore, based on stigma theory, it can be assumed that attending a segregated special school will have negative consequences on SWB in the long-term.

Life events after leaving school such as transitioning into VET or employment are associated with further resources and social roles, inducing positive effects on SWB (Schimmack et al. 2002). However, as (inclusive versus segregated) educational settings have been shown to have a substantial influence on later possibilities for participation in training and the labour market (see above), such opportunities for students with SEN-L differ depending on the educational setting they previously attended. Hence, we expect differences in SWB in early adulthood between former students with SEN-L from segregated and from inclusive settings to – partly – result from differences in their labour market status.

## Data

We conducted empirical analyses on data from the NEPS, Starting Cohort 4 (NEPS Network 2019), which is a representative cohort of 16,425 students who attended Grade 9 in 2010 and have been interviewed once or twice each year ever since. Information was collected from students, schools and parents. All participants gave their informed consent to take part in the study.

## Sample

Our sample consisted of respondents classified as having SEN-L from inclusive and segregated educational settings. Cases were classified as respondents with SEN-L from segregated settings if they were sampled at a special school for students with SEN-L in Grade 9 and if the last school they attended was also a special school ( $n = 774$ ).

Respondents with SEN-L from inclusive settings were included if either they or their parents indicated that they had been labelled as having SEN-L at some point during their school career and attended a mainstream school when sampled in Grade 9 as well as right before leaving the school system ( $n = 549$ ).

As we measured the study's outcome in Wave 10 of the NEPS Starting Cohort 4, our analytical sample only included participants with valid information on this measure ( $n = 628$ ) (see Table A2 on the full and analytical samples in Section 1 of the supplemental online material).

## Outcome measure

As global indicator for SWB, we used a measurement of general life satisfaction assessed with the question 'All in all, how satisfied are you with your life at the moment?' (Diener et al. 1999). Respondents could answer on a scale from 0 'totally dissatisfied' to 10 'totally satisfied'. It was measured in Wave 10 when the respondents were approximately 20 to 21 years old and had been out of school for four to five years.



## Method

### *Analytical strategy*

To analyse the effect of educational setting on the general life satisfaction of respondents at the age of 20/21, we proceeded in two steps:

#### *Step 1: accounting for selection into educational settings*

Any analysis of the effect of an educational setting on post-school outcomes would be confounded by the phenomenon that the selection of students with SEN-L into inclusive versus segregated settings is not random, but associated with students' individual characteristics (see above). Thus, respondents with SEN-L attending school in inclusive and segregated settings are likely to differ systematically with regard to their socio-demographic characteristics and (non-)cognitive skills. As these factors have been shown to influence SWB (see above), differences in SWB could arise independently of the educational setting as a result of the compositional differences between the two groups. To account for differences in respondents' characteristics that could affect both selection into inclusive versus segregated settings and SWB, we used entropy balancing (Hainmueller 2012). This method calibrates weights for a control group (in our case: students with SEN-L from inclusive settings) in a way that it resembles a treatment group (in our case: students with SEN-L from segregated settings) with regard to the distribution of observable characteristics.

We included a wide range of information on the respondents' observable individual and socio-demographic characteristics in the entropy balancing:

As *socio-demographic characteristics*, we considered respondents' gender, migration background, parental employment, highest level of parental education, number of books at home and family constellation when growing up.

*Basic cognitive skills* were captured with two measures, one for perceptual speed and one for deductive reasoning, that have been shown to provide valid measures also for students with SEN-L (Gnambs and Nusser 2019).

For *non-cognitive skills*, we used two measures, one for prosocial behaviour and one for problematic peer relationship behaviour, from the Strength and Difficulties Questionnaire (SDQ; Goodman 1997).

With few exceptions, respondents' individual and socio-demographic characteristics were measured when they were first interviewed in Wave 1. If information was available from several sources (e.g. from respondent and parent questionnaires), we used the information from the source deemed to be most reliable. Detailed information on the measurement of the respondents' individual and socio-demographic characteristics is given in Table A1 in Section 1 of the supplemental online material.

In addition, we included information on the federal state of the sampling school in the entropy balancing. This was advisable because federal states differ with regard to the organisation of inclusive education for students with SEN – and thus also with regard to their selection into inclusive and segregated educational settings. In addition, the opportunity structures for students after leaving school differ between federal states (BIBB 2022), which in turn might influence long-term SWB.

We replaced the remaining missing information on individual and socio-demographic characteristics through multiple imputation by chained equations (MICE; see Table 1 for



**Table 1.** Distributions of individual and socio-demographic characteristics by educational setting – analytical sample before and after entropy balancing (column percentages or means [standard deviations]) and share of missing information before imputation (row percentages).

	Before balancing		After balancing		Percent missing information before imputation
	SEN-L: inclusive	SEN-L: segregated	SEN-L: inclusive	SEN-L: segregated	
Socio-demographic characteristics					
Gender: female	42%	46% <sup>n.s.</sup>	46%	46% <sup>n.s.</sup>	0.2%
Migration background: yes	11%	15% <sup>n.s.</sup>	15%	15% <sup>n.s.</sup>	12.7%
Parental employment:					4.9%
No parent employed	4%	16%***	16%	16% <sup>n.s.</sup>	
One parent employed	21%	37%***	36%	37% <sup>n.s.</sup>	
Both parents employed	75%	47%***	48%	47% <sup>n.s.</sup>	
Highest parental education:					6.2%
No degree	7%	25%***	23%	25% <sup>n.s.</sup>	
Vocational degree	76%	70% <sup>n.s.</sup>	74%	70% <sup>n.s.</sup>	
Tertiary degree	17%	5%***	3%	5% <sup>n.s.</sup>	
Number of books at home:					9.6%
0 to 10	9%	29%***	33%	29% <sup>n.s.</sup>	
11 to 25	12%	29%***	22%	29% <sup>n.s.</sup>	
26 to 100	26%	21% <sup>n.s.</sup>	23%	21% <sup>n.s.</sup>	
More than 100	53%	21%***	22%	21% <sup>n.s.</sup>	
Family constellation:					11.3%
w/both biological parents	74%	66% <sup>n.s.</sup>	66%	66% <sup>n.s.</sup>	
w/one parent and step mother/father	8%	9% <sup>n.s.</sup>	8%	9% <sup>n.s.</sup>	
w/single parent	15%	18% <sup>n.s.</sup>	22%	18% <sup>n.s.</sup>	
w/other persons than parents	3%	7% <sup>n.s.</sup>	4%	7% <sup>n.s.</sup>	
Cognitive skills					
Perceptual speed (z-standardised) <sup>1</sup>	−0.08 [1.02]	−0.75 [0.98]***	−0.75 [1.02]	−0.75 [0.98] <sup>n.s.</sup>	10.2%
Deductive reasoning (z-standardised) <sup>1</sup>	−0.23 [1.05]	−1.44 [1.01]***	−1.44 [1.09]	−1.44 [1.01] <sup>n.s.</sup>	10.8%
Non-cognitive skills					
Prosocial behaviour (z-standardised) <sup>1</sup>	−0.02 [1.00]	−0.07 [1.11] <sup>n.s.</sup>	−0.07 [1.14]	−0.07 [1.11] <sup>n.s.</sup>	13.2%
Problematic peer relationship behaviour (z-standardised) <sup>1</sup>	0.25 [1.10]	0.39 [1.14] <sup>n.s.</sup>	0.39 [1.37]	0.39 [1.14] <sup>n.s.</sup>	14.5%
N	324	304	324	304	

<sup>a</sup>Z-standardised across the whole cohort. Statistical significance of the difference between the two groups: \*\*\* $p < 0.001$ ,

\*\* $p < 0.01$ , \* $p < 0.05$ , <sup>n.s.</sup> difference not statistically significant at least at the 5% level, two-sided tests.

Source: doi:10.5157/NEPS:SC4:10.0.0; authors' calculations.

the shares of missing values for the individual and socio-demographic characteristics before imputation). We imputed 15 datasets, on which all analyses were run separately and then combined according to Rubin's rules (Little and Rubin 2002).<sup>1</sup>

### Step 2: accounting for differential labour market chances

In a second step, we investigated the role of labour market status in early adulthood for differences in the general life satisfaction of former students with SEN-L. To this end, after applying the weights from entropy balancing, we estimated linear OLS regression models on general life satisfaction at the age of 20/21, controlling for the respondents' labour market status at the time of the interview in Wave 10. We distinguished between respondents who were integrated into some form of educational training or employment at this point and those who were in NEET. The NEET category included all forms of

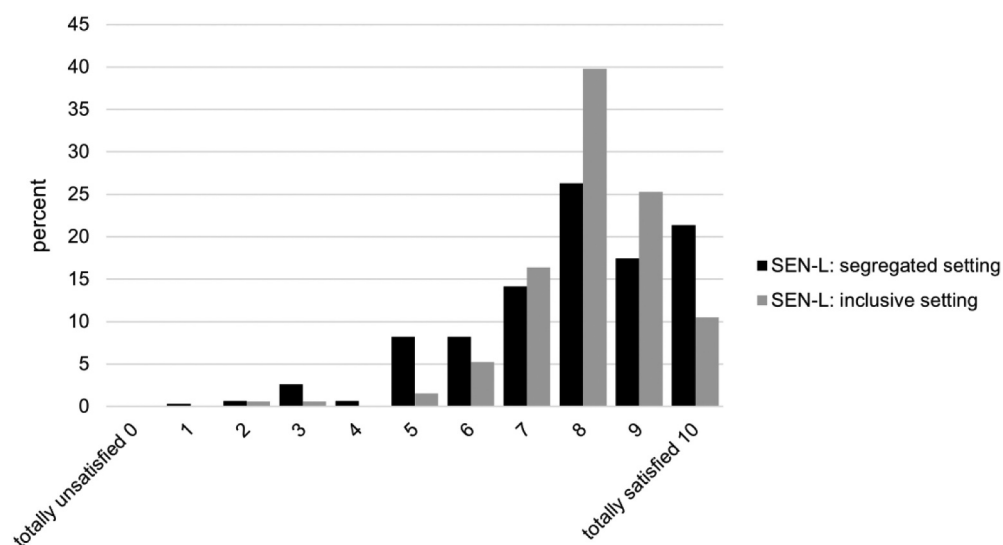
inactivity, i.e. unemployment, parental leave and other status (vacation, sick/not able to work, homemaker, retirement and 'something else').

## Results

As can be seen in Table 1, before application of the weights from entropy balancing, the two groups differed regarding the distribution of individual and socio-demographic characteristics. Moreover, whereas the distribution of non-cognitive skills was similar in the two groups, there was a significant difference in cognitive skills (see also Figure A1 in Section 1 of the supplemental online material). As shown in Table 1 (and Figure A2 in Section 1 of the supplemental online material), differences in individual and socio-demographic characteristics between the two groups disappeared after applying the weights from entropy balancing.

### *General life satisfaction at the age of 20/21*

Figure 1 shows the distribution for the response scale for general life satisfaction of respondents with SEN-L from inclusive and segregated settings, measured at approximately the age of 20/21. In general, both groups were rather satisfied with their lives. However, while respondents from inclusive settings were highly concentrated in the upper part of the scale (values 7 to 9), the respondents from segregated settings were more widely distributed across the scale, with more responses in the middle of the scale (values 3 to 6). At the same time, more respondents from segregated settings indicated that they were 'totally satisfied' with their lives (maximum value of 10). As a result, the



**Figure 1.** Distribution of general life satisfaction at age 20/21 (wave 10) by educational setting. Source: doi:10.5157/NEPS:SC4:10.0.0; authors' calculations.

**Table 2.** Labour market status in wave 10 by educational setting (column percentages or means [standard deviations]).

	SEN-L: segregated setting	SEN-L: inclusive setting
Individuals not in NEET	71.0%	92.6%
amongst them ...		
in education	29.3%	51.9%
in employment	41.7%	40.7%
Individuals in NEET	29.0%	7.4%
amongst them ...		
unemployment	23.4%	5.6%
parental leave	1.6%	0.3%
other	4.0%	1.5%
N	304	324

Source: doi:10.5157/NEPS:SC4:10.0.0; authors' calculations.

average values were lower for respondents from segregated settings (mean of 7.83 vs 8.08).

### *NEET status at the age of 20/21*

Table 2 shows strong differences between respondents with SEN-L from inclusive and segregated settings in NEET at the age of 20 to 21. While only 7.4% of the respondents from inclusive settings were in NEET, this was the case for 29% of respondents from segregated settings. Unemployment was the main reason for NEET in both groups.

### *Consequences of educational setting for general life satisfaction at the age of 20/21*

Model 1 in Table 3 shows the raw coefficient for educational setting before entropy balancing, revealing a difference of 0.25 points on the scale for general life satisfaction between former students with SEN-L from segregated and inclusive educational settings. Model 2 shows the coefficient for educational setting after entropy balancing. This coefficient is not lower in size (−0.30), but because the standard errors are higher, the coefficient is no longer statistically significant. Hence, based on this model, there were no

**Table 3.** General life satisfaction at age 20/21 (wave 10)—results of OLS regression (robust standard errors in parentheses).

	M1: before entropy balancing	M2: after entropy balancing	M3: after entropy balancing + labour market status in Wave 10
Educational setting ( <i>Ref.: inclusive setting</i> )			
segregated setting	−0.25* (0.13)	−0.30 (0.31)	−0.25 (0.32)
Labour market status in Wave 10 ( <i>Ref.: not in NEET</i> ) in NEET			−0.66 (0.49)
Constant	8.08*** (0.07)	8.13*** (0.29)	8.27*** (0.23)
N	628	628	628

\* $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Source: doi:10.5157/NEPS:SC4:10.0.0; authors' calculations.

statistically significant long-term consequences of the educational setting on the general life satisfaction of a comparable group of respondents with SEN-L.

In Model 3, we further controlled for labour market status in Wave 10. In this model, the coefficient for educational setting decreased to the initial value of  $-0.25$ , but again was not statistically significant. This indicated that differences in access to the labour market for young people from inclusive and segregated educational settings did not explain the gap in life satisfaction between the two groups. The coefficient for being in NEET points towards a negative effect of not being in employment and training at the time of the interview on life satisfaction in Wave 10—albeit without reaching statistical significance. The results for the robustness checks are reported in Section 2 of the supplemental online material.

## Discussion

This study examined the long-term consequences of educational settings on life satisfaction in early adulthood of former students with SEN-L in Germany. Using rare longitudinal data, we applied entropy balancing to a comprehensive set of individual and socio-demographic characteristics to account for selection mechanisms underlying the enrolment of students into inclusive or segregated educational settings before or during their school career. We then investigated the effects of educational settings and current NEET status on life satisfaction at the age of approximately 20 to 21 years. To this end, we estimated linear OLS regressions.

Overall, young adults with a former SEN-L label in inclusive and segregated educational settings reported rather high scores in life satisfaction. Although the variation within the group was high, on average the young adults seemed to be satisfied with their life after leaving school. However, even five to six years after leaving school, the young adults differed with regard to their reported life satisfaction depending on the educational setting they attended. Former students with SEN-L from segregated educational settings reported – on average – slightly lower levels of life satisfaction at the age of 20 to 21 compared to former students with SEN-L from inclusive educational settings. Moreover, students attending special schools were much less likely to be integrated into VET or the labour market after leaving school.

After consideration of the systematic differences in individual and socio-demographic characteristics between the two groups through entropy balancing, the effect of educational setting on life satisfaction was not statistically significant. As differences in SWB did not result from educational settings, we also had to reject our assumption that such differences result (at least in part) from differential risks of exclusion from the labour market (measured as NEET status). More generally, our analysis points to the importance of, on the one hand, including comparison groups when studying the effects of educational settings for students with SEN and, on the other hand, of accounting for the mechanisms underlying selection into these settings.

Theoretically, our findings indicate that we cannot argue that a ‘safe space’ such as a special school as a segregated educational setting has a buffer effect for adolescents with SEN-L. While we did not find significant effects of segregated educational settings on SWB, the prevalence of NEET among students from these settings was much higher.

Hence, the stigma associated with attendance of a special school seems to persist for a long period even after students leave school (Powell and Pfahl 2019).

Our results regarding post-school transitions thus support critique of segregated educational settings in special schools. This form of educational segregation is particularly strong because it takes place outside of mainstream schools. With respect to post-school transitions, our results also underline the need for support of former students with SEN-L during the transition phase. However, Germany already has a strong transition and vocational rehabilitation system in place for school leavers with low educational attainment, especially for those with SEN, to facilitate successful transitions from school to work. Our results raise the question as to whether this current support system needs to be reorganised in order to make it more effective or whether such support systems for the transition from school to work are generally inadequate in counteracting the stigma associated with segregated educational settings.

Our study has several limitations. First, the NEPS is one of the few studies that include students with SEN from both educational settings. However, to identify students with SEN in inclusive settings, we had to rely on information from the parents and/or the students themselves. As this information may differ from official SEN labels, identification of this group was therefore difficult. Hence, our identification strategy is potentially subject to criticism. Second, our analytical strategy of using entropy balancing to account for systematic selection into educational settings had to rely on observable characteristics included in the data. While the NEPS allowed us to include a wide variety of characteristics, we cannot rule out the existence of further (unobserved) differences between the two groups that could influence the results. For instance, difficulties in achieving learning goals set by the regular curriculum (which is how SEN-L is defined) may not only result from low cognitive ability, but also from individual differences in attention, learning strategies or psychological impairments. Information on such differences, which might impact the selection of students into inclusive and segregated educational settings, is not included in the NEPS data. Also, due to data limitations, we could not account for differences regarding the organisational forms of inclusive education within mainstream schools or the quality of teaching practices in inclusive classes, which may impact stigma processes. Thus, our definition of inclusive schooling focused solely on the school placement of students (Göransson and Nilholm 2014). Finally, the descriptive findings on the labour market status of respondents revealed that a substantial proportion of students from both educational settings were still in education at the age of 20/21. This indicates that they were still transitioning from school to work. The effects of educational settings on long-term SWB might therefore be better observable when the transition phase is completed.

Despite these limitations, our study has presented novel insights into the consequences of inclusive versus segregated educational settings on the SWB of former students with SEN-L in early adulthood. Future research might further explore the role of inclusion in post-secondary education or the labour market for the individual developments and life satisfaction of students with SEN-L after leaving school. While NEET status may affect SWB independently of the educational setting, its effect may differ between former students from inclusive and segregated settings. Measurement of such interaction effects was beyond the scope of the present study, and the sample size of the NEPS is not sufficient to allow an in-depth investigation of these effects.

## Note

1. Our imputation model encompassed all variables included in the entropy balancing (individual and socio-demographic characteristics, federal state), the school type at which students were sampled, information on SEN-L and inclusive/segregated setting as well as the outcome of our analyses (general life satisfaction in Wave 10). We additionally included indicators on students' school-to-work transition in the imputation model (general life satisfaction in Grade 10, school-leaving certificate, access to VET, total number of months in NEET until Wave 10, status in Wave 10 and, for students in NEET in Wave 10, the number of months already in NEET). We ran the imputation on the whole cohort. We did not use imputed information on the outcome for the analyses (von Hippel 2007).

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## Disclosure statement

No potential conflict of interest was reported by the author(s).

## ORCID

Jonna M. Blanck  <http://orcid.org/0000-0003-3193-7202>

Laura Menze  <http://orcid.org/0000-0003-3442-279X>

Lena Nusser  <http://orcid.org/0000-0002-2967-8734>

## Data availability statement

This paper used data from the National Educational Panel Study (NEPS; see Blossfeld and Roßbach 2019). The NEPS is carried out by the Leibniz Institute for Educational Trajectories (LIfBi, Germany) in cooperation with a nationwide network. Data are available as a scientific use file after signing a data use agreement (doi:10.5157/NEPS:SC4:10.0.0).

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