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The Relationship between Educational Level, Students' Special Needs and Teachers' Attitudes towards Inclusion in Germany

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Abstract

Positive attitudes of teachers are considered as key requirements for a successful implementation of inclusive education. Current inclusive education practices in Germany are grounded on structurally established educational levels within a traditional selective school system. Teachers' attitudes towards inclusive education are associated with their experiences with inclusive settings and their experiences with students with special educational needs (SEN). Unequal distributions of students with (different types of) SEN across the educational levels suggest systematic differences in teachers' experiences with SEN in inclusive settings. This study examined the relationships between the educational level (i.e. primary level, secondary level, and vocational level) and differences in teachers' attitudes towards inclusive education with students of different types of SEN. 1 630 teachers in North Rhine-Westphalia completed an online-survey assessing three dimensions of attitudes towards the inclusion of students with four different types of SEN. A MANOVA and a series of 3×4 mixed-design ANOVAs revealed significant effects of educational level on teacher attitudes. Results showed that the relationship between different types of SEN and teachers' attitudes varied by educational level. Findings indicate that structural disparities within the German educational system are related to teachers' attitudes toward inclusion and attitude differences toward the inclusion of students with different types of SEN. Implications for improvements in professional development and directions for future research are discussed.

Keywords: teachers' attitudes, inclusive education, special educational needs, regular education, educational level, educational system

Der Zusammenhang zwischen Bildungsstufe, besonderen pädagogischen Bedürfnissen von Schülerinnen und Schülern und Einstellungen von Lehrkräften zur Inklusion in Deutschland

Zusammenfassung

Positive Einstellungen von Lehrkräften werden als zentrale Voraussetzung zur erfolgreichen Implementation schulischer Inklusion angenommen. Schulische Inklusion wird in Deutschland vor dem Hintergrund strukturell etablierter Bildungsstufen innerhalb eines traditionell selektiven Schulsystems umgesetzt. Einstellungen von Lehrkräften gegenüber der schulischen Inklusion hängen mit ihren Erfahrungen in inklusiven Unterrichtssettings sowie mit ihren Erfahrungen mit Schülerinnen und Schülern (SuS) mit Förderbedarf zusammen. Die ungleiche Verteilung von SuS mit

(unterschiedlichen) sonderpädagogischen Förderbedarfen über die Bildungsstufen des Schulsystems legen systematische Unterschiede in den Erfahrungen von Lehrkräften im Umgang mit sonderpädagogischem Förderbedarf im inklusiven Unterricht nahe. Die vorliegende Studie untersucht den Zusammenhang zwischen den Bildungsstufen (Primarstufe, Sekundarstufe, berufsbildende Stufe) und Einstellungsunterschieden von Lehrpersonen gegenüber der Inklusion von SuS mit unterschiedlichen Förderbedarfen. 1 630 Lehrkräfte aus Nordrhein-Westfalen beantworteten eine Online-Befragung zur Erfassung von drei Einstellungsdimensionen hinsichtlich der Inklusion von SuS mit vier Formen sonderpädagogischen Förderbedarfs. Eine MANOVA sowie eine Serie zweifaktorieller (3×4) ANOVAs mit Messwiederholung auf einem Faktor belegen signifikante Effekte der Bildungsstufe auf die Einstellungen der Lehrkräfte. Die Ergebnisse zeigen, dass der Zusammenhang zwischen sonderpädagogischem Förderbedarf und Einstellung in Abhängigkeit der Bildungsstufe variiert. Es ergeben sich Hinweise darauf, dass strukturelle Unterschiede innerhalb des Schulsystems mit Einstellungen von Lehrkräften zur Inklusion und Einstellungsunterschieden gegenüber der Inklusion von SuS mit unterschiedlichen Förderbedarfen zusammenhängen. Implikationen zur Verbesserung der Aus- und Weiterbildung von Lehrkräften sowie für die zukünftige Forschung werden diskutiert.

Schlagwörter: Einstellungen, Lehrkräfte, Inklusion, sonderpädagogischer Förderbedarf, Bildungsstufe, Schulsystem

Background

In 2009, the United Nations Convention of the Rights of Person with Disabilities (UN-CRPD) became legally effective in Germany (United Nations, 2006). The purpose of the convention is “to promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity” (United Nations, 2006, Article 1). Signing the convention, Germany as well as all signatory states were required to ensure inclusion of persons with disabilities in the general education system and that students with SEN “can access an inclusive, high quality and free primary and secondary education on an equal basis with others in the community in which they live” (United Nations 2006, Article 24, 2b). Although the convention was designed to ensure an inclusive educational system, there is neither a generally accepted definition of the term “inclusive education” nor an agreement about characteristics associated with that term (Farrell, 2004; Grosche,

2015). Göransson and Nilholm (2014) identified four different types of definitions, which can be ordered hierarchically. The first and probably most simple definition describes inclusion as placing students with SEN in regular classrooms. The second definition explains inclusion as meeting the social and academic needs of students with disabilities in regular education. The third definition focuses on all students and describes inclusion as meeting the social and academic needs of all students. The fourth and most complex definition emphasizes the characteristics of social groups and describes inclusion as building up social communities and companionship. Consistent across the definitions, the implementation of inclusive education requires students with SEN to attend regular schools. However, neither the school system in Germany nor the German teachers are adequately prepared to fulfill the requirements with respect to inclusive education (Heinrich, Urban, & Werning, 2013).

Educational Levels of the German School System

In general, the German regular school system is comprised of three educational levels: (1) primary schools, (2) secondary schools, and (3) vocational colleges (Federal Ministry of Educational Research, 2016). In Primary schools student's age is 6 to 10 (grade level 1 to 4). Education in primary schools basically includes literacy, mathematics, science, foreign language as well as other subjects. At the end of primary schools, teachers recommend the type of secondary school appropriate for a student. Usually, there is only one type of primary school serving all students including those with and without SEN. In contrast, secondary schools consist of various school types resulting in different secondary school qualifications.

Secondary schools include students aged 10 to 18 (grade level 5 to 12). Secondary schools range from grammar schools, which prepare students to enter tertiary education, to general secondary schools, which prepare students for an apprenticeship. Vocational colleges are subsequent to secondary schools and focus on general and vocational education. For example, vocational schools represent a subtype of vocational colleges that combine academic studies with an apprenticeship. Depending on the type of the apprenticeship, vocational schools may focus on academic studies or vocational-oriented studies, such as trade or technical subjects.

The 16 federal states in Germany are by law authorized to establish subtypes within the regular school system. Especially the level of secondary education includes several variations such as comprehensive schools, secondary schools, intermediate schools or Free Waldorf schools. North Rhine-Westphalia, the most populous federal state, generally adopts the regular school system and is a reasonable example of the broader German regular school system.

Students with Special Educational Needs

In addition to the regular school types, the German school system includes separate schools for students with special needs. Special needs schools may cover primary as well as secondary education and are classified by the type of SEN. As a result, there are various special needs schools that specifically address learning and academic needs, emotional and social development, mental development, physical and motor development, speech problems, hearing impairments, or visual impairment. Most special needs schools grant a special diploma, usually at the secondary regular school level.

In an inclusive educational system, students with SEN are expected to be included in the regular school system. As changes in the existing German school system are complex, the process of developing inclusive schools has been a gradual ongoing process. The percentage of students with SEN attending regular schools instead of special needs schools increased from 19.8 % to 34.1 % between 2009 and 2014 (Federal Ministry of Educational Research, 2016). According to the data from 2016, in North Rhine-Westphalia, 5.4% of school-aged students were classified as having SEN and 40.5 % of students with SEN participated in regular schools (Ministry of School and Education in North Rhine-Westphalia, 2017). However, the percentage of students with SEN varied by the school type. For example, only 0.7 % of all vocational college students had SEN whereas 2.8 % of all secondary school students were classified with SEN (c.f. table 1).

The percentage of students with SEN also varied by the type of SEN. In 2016, 15.5 % of all students with SEN in North Rhine-Westphalia had mental disabilities, whereas 7.9 % primary school students had SEN regarding mental development, 4.8 % of all secondary school and only 1.7 % of all vocational college students had SEN regarding mental development (cf. table 2). Thus, primary, secondary and vocational colleges in

Table 1: Regular School Types and Students With and Without SEN in North Rhine-Westphalia, Germany, 2016 (Ministry of School and Further Education of North Rhine-Westphalia, 2017)

School Type	Total number of students	Total number of students with SEN	Percentage of students with SEN
All school types	2 519 527	138 848	5.5%
Primary schools	632 693	19 366	3.1%
Secondary schools	1 220 290	33 777	2.8%
Vocational schools	560 812	3 627	0.7%
Special needs schools	82 469	82 078	99.5%

Table 2: Regular School Types and Types of SEN in North Rhine-Westphalia, Germany, 2016 (Ministry of School and Further Education of North Rhine-Westphalia, 2017)

School Type	Total number of students with SEN	thereof with SEN with focus on					
		Learning	Emotional and social development	Mental development	Speech	Physical and motor development	Others
All school types	138 848	31.0 %	23.4 %	15.5 %	13.7 %	7.9 %	8.4 %
Primary schools	19 366	33.7 %	24.4 %	7.9 %	21.6 %	7.6 %	5.1 %
Secondary schools	33 777	45.3 %	29.4 %	4.8 %	12.2 %	4.1 %	4.1 %
Vocational schools	3 627	77.9 %	15.4 %	1.7 %	value unknown	4.1 %	0.9 %

Note. *Others: E.g. students with SEN with focus on vision or hearing.

Germany differ in the overall percentages of students with SEN as well as in the proportions of students with specified types of SEN.

Teachers' Attitudes Toward Inclusive Education

Attitudes are defined as "predispositions to respond in a particular way toward a specified class of objects" (Rosenberg & Hovland, 1969, p. 1). These classes may comprise various stimuli as situations, individuals, social issues or groups. In line with Rosenbaum, Armstrong, and King (1986), Eagly and Chaiken (1993), and Mahat (2008), attitude as a theoretical construct is specified by a multidimensional model consisting of three components: a cognitive component (perceptual responses or evaluative beliefs), an affective component (emotional responses, feelings or sentiments), and a behavioral component (behaviors or behavior intentions). Apart from modelling attitude as a

construct, other research perspectives focus on the relationship between attitudes and other dependent variables. For instance, in Ajzen's (1985) widely applied Theory of Planned Behavior, attitudes, subjective norm and perceived behavioral control were predictors for intentions which in turn predict behaviors. Similarly, Albarracin, Johnson and Zanna (2014) postulate that attitudes affect individuals' cognitions, affects, and behaviors understood as attitude consequences.

In educational research several international studies emphasize the importance of positive teachers' attitudes toward inclusion for the implementation of inclusive education (Avramidis, Bayliss, & Burden, 2000; de Boer, 2012; de Boer, Pijl, & Minnaert, 2011; Hellmich & Görel, 2014). In an extend literature review, Avramidis and Norwich (2002) found associations between child-related, teacher-related and environment-related variables and teacher attitudes. A more recent review by de Boer, Pijl, and Minnaert (2011)

confirmed these associations. Although findings about the associations between attitudes and teachers' age and gender are inconsistent (Avramidis & Norwich, 2002; de Boer, Pijl, & Minnaert, 2011), the research on attitudes and inclusion revealed teachers' experience with inclusive educational practices and their experiences in teaching children with a disability as related to teachers' attitudes towards inclusion (Avramidis & Kalyva, 2007; Batsiou, Bebetos, Panteli, & Antoniou, 2008). For example, Avramidis and Kalyva (2007) conducted a study with 155 regular primary school teachers from inclusive and non-inclusive schools and found a significant association between "experience of inclusion" (p. 381) and teachers' attitudes. Experience was operationalized by the institutional affiliation of teachers. Experienced teachers were more likely to show more positive attitudes than inexperienced teachers. Additionally, the authors reported significant attitude differences between teachers who attended long-term professional development programs and teachers who received no training. In another German study conducted with 201 primary school teachers, Hellmich and Görel (2014) found that experiences in inclusive contexts, perceived self-efficacy, and perception of inclusion had positive impacts on teachers' attitudes toward inclusion. The three variables explained 47 % of variability in the attitude measures.

Avramidis and Norwich (2002) and de Boer, Pijl, and Minnaert (2011) reported a strong association between students' type of SEN and teachers' attitudes toward inclusion. Avramidis and Norwich (2002) found that teachers reported more positive attitudes toward the inclusion of students with physical and sensory impairments as compared to the inclusion of students with learning difficulties (LD) and emotional-behavioral disorders (EBD). Similarly, de Boer, Pijl, and Minnaert (2011) found that teachers had the strongest negative attitudes toward the inclusion of students with EBD, cognitive disabilities and LD and the strongest positive attitudes toward

the inclusion of students with physical disabilities and sensory impairments. Lifshitz, Glaubman, and Issawi (2004) reported that teachers' attitudes toward the inclusion of students with EBD, moderate intellectual disabilities (MID), severe intellectual disabilities (SID), LD, physical handicaps and sensory deficits varied by the severity and type of SEN.

These findings were consistent with other studies conducted in German speaking countries. Gebhardt et al. (2011) reported significant attitude differences in Austrian teachers toward the inclusion of students with different types of SEN. The study found the most positive attitudes toward inclusion of students with physical disabilities, followed by students with LD. The most negative attitudes were reported for the inclusion of students with SID. Schwab and Seifert (2015) also found significant differences in the attitudes of teacher trainees depending on students' types of SEN. Consistent with prior research, the authors reported the most positive attitudes towards the inclusion of students with physical disabilities, followed by teacher trainees' attitudes towards the inclusion of students with LD and SID. The participants expressed the most negative attitudes towards the inclusion of students with EBD. Additionally, Schwab et al. (2012) found that teachers in Austria viewed inclusion of students with EBD as the most problematic, followed by inclusion of students with SID. The teachers in this study expressed the most positive views toward inclusion of students with physical disabilities and LD.

Across existing studies, teachers and teacher trainees have reported the most positive attitudes toward inclusion of students with physical disabilities, followed by attitudes toward inclusion of students with LD, MID, and SID. Teachers and teacher candidates seem to perceive inclusion of students with EBD as most difficult.

Research Questions

Based on the research, the attitudes of teachers may vary depending on their experience in inclusive educational contexts and their experience in teaching children with a disability. Additionally, attitude differences may be explained by types of SEN.

Considering the heterogeneous environments within the educational contexts of the German School system, such as the unequal percentages of students with SEN placed in different educational levels and the variations in the distribution of those students by the types of their SEN, the authors assumed systematic differences in teachers' attitudes working at different educational levels. Based on the descriptive information about students with SEN across school types and the empirical evidence on relationships between teachers' attitudes and experiences with students with SEN, we assumed a significant association between teachers' attitudes and the educational level of their working context. Teachers from different educational levels may have different experiences in working with students with SEN and in inclusive settings. Thus, we hypothesized the educational level contributed significantly to explain differences in teachers' attitudes (H1).

Furthermore, the presented descriptive information about the percentages of students with different types of SEN across the educational levels imply that attitude differences toward the inclusion of students with specific types of SEN may also be associated with the educational level. Although there is some empirical evidence that environmental variables like availability of (physical and human) support on classroom and school level (Avramidis & Norwich, 2002) or school climate (Weisel, 2006) are related to teachers' attitudes toward inclusion, there is a lack of research focusing on organizational and structural variables and their contribution to explain attitude differences in Germany. Consequently, our research was guided by the second research question: 2. Is the edu-

ational level associated with differences in teachers' attitudes toward the inclusion of students with different types of SEN?

Based on the presented state of research on teachers' attitudes toward the inclusion of students with specific types of SEN, we assumed that attitude differences are associated with the types of SEN. Thus, we hypothesized that the type of SEN has a significant impact on teachers' attitudes (H2a).

Based on the work of Avramidis and Norwich (2002), Schwab and Seifert (2015) and Schwab et al. (2012), we presumed the most negative attitudes toward the inclusion of students with EBD. Additionally, based on the research of Gebhardt et al. (2011), Lifshitz, Glaubman, and Issawi (2004), we presumed most positive attitudes toward the inclusion of students with LD, followed by MID and SID. Thus, we hypothesized (a) that teachers had more positive attitudes toward inclusion of students with LD than toward inclusion of students with MID, (b) that teachers had more positive attitudes toward inclusion of students with MID than toward inclusion of students with SID, and (c) that teachers had more positive attitudes toward inclusion of students with SID than toward inclusion of students with EBD (H2b).

Additionally, we assumed that the relationship between type of SEN and teachers' attitudes varied across the educational levels, as teachers of different institutional contexts may have different experiences regarding students without SEN and students with different types of SEN. Thus, we also hypothesized the educational level to explain differences in the relationship between type of SEN and teachers' attitudes (H2c). In other words, there is a significant interaction of educational level and type of SEN which has an impact on attitude differences.

Method

Research Design

The study is based on a subsample from a statewide online-survey of teachers from all schools in North Rhine-Westphalia. The survey combines metric and open-ended questions and was developed to measure attitudes, conceptual knowledge and competence related knowledge of teachers regarding educational inclusion.

Subjects and Procedures

The target population includes 194 704 in-service teachers from 5 988 schools located in North Rhine-Westphalia (Ministry of School and Education in North Rhine-Westphalia, 2016). The sample of all administrators was contacted via e-mail¹. Additionally, a random sample of 300 institutions were contacted via postal mail. The administrators volunteered in forwarding information about the survey to their faculties. These included motivation letters, the URL of an information website, and the weblink to the online-survey. In order to reduce sampling and non-response bias of school administrators and teachers, 120 faculties with high respondent rates (two-thirds of all teachers) were provided an opportunity to send two to five of their teachers to advanced in-service workshops. Additionally, without consideration of the response rates, a random sample of participants were provided an opportunity to receive 50 book coupons (à 20 Euro) that were drawn by lots as incentives. All schools were contacted in three waves between February and May 2016.

The present study includes data from 1 316 (80.7 %) female and 314 (19.3 %) male participants ($N = 1 630$). The age of participants varied between 24 and 65 ($M = 44.99$, $SD = 10.43$). A total of 283 participants were special education teachers (17.4 %), 1 212 participants were regular

school teachers (74.4 %), and 29 teachers were qualified for both types (1.8 %). A total of 106 participants did not provide information about their educational background or could not be assigned to one of these categories (6.5 %). The mean experiences in working with students with SEN was 7.15 years ($SD = 8.17$), 250 of all participants (15.3 %) reported no experience in working with students with SEN. A total of 684 teachers (42 %) worked at primary schools, 795 teachers (49 %) worked at secondary schools, and 151 teachers worked at vocational colleges (9 %).

Measures

We used the International Survey on Inclusion, translated to German and validated in Germany (Przibilla, Lauterbach, Boshold, Linderkamp, & Krezmien, 2016) to assess teachers' attitudes toward inclusion. The instrument assessed emotional and cognitive aspects of attitudes on three subscales labeled *optimism*, *belief in inclusion* and *own ability*. We focused on attitudes toward inclusion of students with severe intellectual disabilities (SID), moderate intellectual disabilities (MID), learning disabilities (LD) and emotional or behavioral disorders (EBD). Based on the validation study (Przibilla et al., 2016), the survey was optimized by adjusting response options on Likert-scaled items and vignettes.

Special Educational Needs. Differentiations of SEN were represented by two different question types. On the one hand, the types of SEN were operationalized by vignettes that inform about competencies and behaviors of specified students in inclusive settings without naming the types of SEN (e.g. EBD: "Tim is a student who is often verbally inappropriate und regularly gets into conflicts with peers. Sometimes Tim is physically aggressive, and is often defiant with adults in a way that impedes his ability to learn"). On the other hand, several items in-

¹ Contact information was provided by the Ministry of School and Education in North Rhine-Westphalia.

cluded response options that were differentiated by labels (1. "Specific Learning Disability", 2. "Emotional Behavioral Disorder", 3. "Severe Intellectual Disability" and 4. "Moderate Intellectual Disability").

School Level. Multiple Choice questions were used to identify the institutional affiliation of participants. Based on responses, participants were assigned to three educational levels: (1.) primary schools, (2.) secondary schools, and (3.) vocational colleges. Cases that could not be assigned to these levels due to overlapped categories were excluded from the analysis.

Own Ability. The *Own Ability* subscale was used to measure teachers' perceived ability to teach students with SEN in inclusive settings. The scale was comprised of five items which assess individual perceptions of teachers about their knowledge about SEN-characteristics and appropriate instructional strategies. The scale includes evaluations of the degree that participants' work at school would contribute to realize full inclusion (e.g., *I know and understand the instructional strategies necessary to teach a student with the following disabilities in a general education classroom*). Besides one item (*I know how to accommodate the unique needs of students with disabilities in my classroom*), all items include differentiated response options related to four types of SEN using a 4-point Likert scale in which higher scores indicated more positive perceptions of abilities. Compared to the reliability reported in the validation study ($\alpha = .89$), the scale reached a comparable high alpha score ($\alpha = .82$).

Optimism. The *Optimism* subscale was used to assess teachers' confidence that inclusive education could be implemented in their institutional contexts. The subscale was comprised of items about the perceived feasibility of inclusive practice at school and professional preparedness. The scale consists of five items which assess cognitive and rational ratings about administrative conditions, anticipated student outcomes, and professional preparedness for inclusive prac-

tices at school (e.g., *My school provides sufficient administrative support to enable me teach this student in a general education classroom*). All items were rated on a 4-point Likert scale for each student-vignette with higher scores indicating higher perceptions of confidence. Compared to the reliability reported in the validation study ($\alpha = .83$) the scale reached a comparable high alpha score ($\alpha = .87$).

Belief in Inclusion. The *Belief in Inclusion* subscale was used to assess teachers' beliefs about key features of inclusive education that should be adopted by inclusive schools. The subscale reflects aspects of personal beliefs about the idea of educational inclusion. The scale consists of 7 items which assess teachers' evaluations about placement, instruction and involvement of students with SEN in school activities. Additionally, the scale includes items on participants' needs with respect to training and cooperation with special educators, as well as the teachers' judgement of predicted acceptance of peers (e.g. *students with disabilities should be involved in all school activities with their peers without disabilities*). All items were rated on a 4-point Likert scale with higher scores indicating more positive beliefs. Compared to the reliability reported in the validation study ($\alpha = .64$) the scale reached a relatively low but still acceptable alpha score ($\alpha = .52$).

Data Analysis

We identified superficial responses by inaccurate trails (e.g. test trials by school administrators). Inaccurate trails were defined as cases with processing times below 5 minutes. Additionally, outliers were identified by z-score transformations of all included variables. Cases that showed superficial responses and outliers were examined for plausibility.

All items which included differentiated response options by the type of SEN were transformed into outcome variables by cal-

culating the arithmetic mean. In order to test H1, a one factorial multivariate analysis of variances (MANOVA) was conducted to compare teachers working at primary and secondary schools as well as vocational colleges. Then, univariate comparisons were conducted to examine responses on the three measures of attitude. In order to test H2a, H2b and H2c, a series of 3 (educational level: primary, secondary, vocational) \times 4 (Type of SEN: SID, MID, LD and EBD) mixed design analyses of variance [ANOVA] with repeated measurement on the second factor was performed for each dependent variable (*Own Abilities*, *Optimism* and *Belief in Inclusion*). The item related response options (by type of SEN) were treated as repeated measurements, while the factor structure was maintained. All analyses were conducted using IBM SPSS Statistics for Windows (Version 24). Multiple comparisons were calculated using Bonferroni correction.

Results

The Relationship between Educational Level and Attitude Measures

The first multivariate analysis (using Wilks's lambda) showed a significant impact of school level on the ratings of the three atti-

tude scales, $\Lambda = 9.14$, $F(3, 250, 6) = 24.865$, $p < .001$ with an effect size of $\eta^2 = .04$. Subsequent univariate analyses regarding the outcome variables indicated significant effects of school level on teachers' subjective evaluation of their *own abilities*, $F(2, 1,627) = 18.974$, $p < .001$, $\eta^2 = .02$, their *perceived optimism*, $F(2, 1,627) = 48.906$, $p < .001$, $\eta^2 = .06$ and their *belief in inclusion*, $F(2, 1,627) = 5.584$, $p = .004$, $\eta^2 = .01$. Post hoc comparisons using Bonferroni corrections indicated that with respect to *own abilities*, the mean score of teachers working at vocational institutions was significantly lower than the mean score of teachers working at primary or secondary schools (both $ps < .001$). With regard to *belief in inclusion*, post hoc tests revealed significantly lower ratings of teachers working at secondary institutions compared to the ratings of the teachers working at the other schools ($p_{\text{SEC-PRIM}} = .014$, $p_{\text{SEC-VOC}} = .039$). With respect to *optimism*, all comparisons were significant, with the highest scores of teachers who worked at primary schools, followed by teachers working at secondary institutions, and the lowest scores of teachers who worked at vocational facilities ($p_{\text{PRIM-SEC}} < .001$; $p_{\text{SEC-VOC}} = .018$; $p_{\text{PRIM-VOC}} < .001$). Intercorrelations between all dependent variables and descriptive statistics are presented in table 3.

Table 3: Mean Scores and Standard Deviations for Measures of Attitude by Educational Level and Correlations between Dependent Variables

	Primary education		Secondary education		Vocational education		Correlations		
	M	SD	M	SD	M	SD	1	2	3
1. Optimism	2.46	.57	2.21	.57	2.07	.59	-	-	-
2. Own Abilities	2.83	.56	2.81	.60	2.52	.61	.56**	-	-
3. Belief in Inclusion	3.12	.40	3.06	.42	3.15	.39	.25**	.20**	-

Note. **correlation is significant at the .01 level (2-tailed)

The Relationship between Educational Level, Types of SEN, and Attitude Measures

Mouchly’s test indicated that the assumption of sphericity was violated for the effect of type of SEN in all factorial repeated-measurement ANOVAs (1st ANOVA [Dependent Variable: *Own Abilities*]: $\chi^2(5) = 285.623$, $p < .001$; 2nd ANOVA [Dependent Variable: *Optimism*]: $\chi^2(5) = 213.499$, $p < .001$; 3rd ANOVA [Dependent Variable: *Belief in Inclusion*]: $\chi^2(5) = 1\,004.185$, $p < .001$). Violations of the assumption of sphericity in repeated-measurement ANOVAs usually lead to increased and unjustifiable test power and as a result, to an increase of type one errors (Döring & Bortz, 2016). Bühner and Ziegler (2009) recommend corrections of the degrees of freedom. Greenhouse-Geisser estimates are stated as accurate factors for reducing the degrees of freedom (Bortz, 2005; Bühner & Ziegler, 2009; Döring & Bortz, 2016). Thus, the degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\epsilon_1 = .887$, $\epsilon_2 = .931$,

$\epsilon_3 = .707$). The mean scores and standard deviations of the dependent variables for all groups and types of SEN are presented in table 4.

Own Abilities. There was a significant main effect of types of SEN on the ratings of teachers, $F(2.660, 4\,497.69) = 609.631$, $p < 0.001$, $\eta^2 = .27$. Post hoc comparisons indicated that the mean scores of teachers across all educational levels significantly differed by the type of SEN with highest ratings for LD followed by MID, EBD and SID ($p_{SID-EBD} < .001$; $p_{EBD-MID} = .011$; $p_{MID-LD} < .001$).

Additionally, there was a significant main effect of educational level on the ratings of teachers’ perceived *own abilities* across the repeated measurements, $F(2, 1\,627) = 21.683$, $p < .001$, $\eta^2 = .03$. Multiple comparisons showed that teachers working at the vocational level had significantly lower ratings compared to the other two groups of teachers (both $ps < .001$), while no significant differences were found between the ratings of primary and secondary teachers ($p = 0.127$).

Table 4: Mean Scores and Standard Deviations of Dependent Variables for 3 Educational Levels and 4 Types of Special Educational Needs

	Severe Intellectual Disability		Moderate Intellectual Disability		Learning Disability		Emotional Behavioral Disorder	
	M	SD	M	SD	M	SD	M	SD
Own Abilities								
Primary	2.45	.70	3.00	.64	3.20	.50	2.93	.61
Secondary	2.43	.71	2.91	.73	3.09	.60	2.89	.69
Vocational	2.25	.66	2.63	.70	2.7	.64	2.60	.66
Optimism								
Primary	2.22	.76	2.67	.62	2.72	.65	2.23	.66
Secondary	1.97	.70	2.34	.68	2.39	.67	2.14	.63
Vocational	1.83	.69	2.17	.67	2.19	.69	2.09	.71
Belief in Inclusion								
Primary	3.05	.42	3.14	.40	3.18	.39	3.13	.40
Secondary	2.97	.45	3.08	.42	3.14	.41	3.07	.43
Vocational	3.09	.41	3.17	.40	3.20	.38	3.16	.40

The interaction between educational level and type of SEN was also significant $F(5.319, 4\ 327.193) = 9.373, p < .001, \eta^2 = .01$. Apparently, the relationship between type of SEN and teachers' *own abilities* varied based on the educational level of their working context. The differences between all types of SEN at primary level were statistically significant ($p_{\text{SID-EBD}} < .001; p_{\text{EBD-MID}} = .016; p_{\text{MID-LD}} < .017$). The ratings of teachers working at secondary schools did not significantly differ for students with EBD and MID ($p_{\text{EBD-MID}} = .658$), while significant differences were found between the other types of SEN (all $ps < .001$). Significant differences were found between SID and the other types of SEN (all $ps < .001$) and between EBD and LD ($p = .032$) for vocational teachers.

Optimism. There was a significant main effect of type of SEN on the ratings of teachers, $F(2.793, 4\ 544.817) = 229.937, p < 0.001, \eta^2 = .12$. Post hoc comparisons indicated that the mean scores of teachers across all educational levels significantly differed with respect to type of SEN, with highest ratings for LD, followed by MID, EBD, and SID ($p_{\text{SID-EBD}} < .001; p_{\text{EBD-MID}} = .011; p_{\text{MID-LD}} = .037$).

Additionally, there was a significant main effect of educational level on the repeated measurements, $F(2, 1\ 627) = 48.906, p < .001, \eta^2 = .06$. Post hoc comparisons indicated that the primary level teachers had significantly higher ratings compared to the other groups of teachers (both $ps < .001$) and the ratings of vocational level teachers were significantly lower than the ratings of secondary school teachers ($p = 0.018$).

The interaction between educational level and types of SEN on the ratings of teachers was also significant $F(5.587, 4\ 544.817) = 18.963, p < .001, \eta^2 = .02$. This finding indicated that the association between types of SEN and teachers' *optimism* was affected by the educational level. For *optimism*, the ratings of primary level teachers significantly differed by disability

type LD, MID and EBD ($p_{\text{LD-MID}} = .028; p_{\text{MID-EBD}} < .001; p_{\text{LD-EBD}} < .001$). The *optimism* toward the inclusion of students with EBD and SID were rated as lowest with no statistical difference between the two. For secondary level teachers, multiple comparisons revealed statistically significant differences between all types of SEN ($p_{\text{SID-EBD}} < .001; p_{\text{EBD-MID}} < .001; p_{\text{MID-LD}} = .013$). For vocational level teachers, the only significant differences were found between SID and all other types of SEN (all $ps < .001$).

Belief in Inclusion. There was a significant main effect of type of SEN on the ratings of teachers, $F(2.122, 3\ 451.71) = 297.172, p < 0.001, \eta^2 = .15$. Post hoc comparisons revealed the highest mean scores for LD which significantly differed from all other types of SEN (all $ps < .001$). The second highest scores were found for MID with no significant differences with the scores for EBD. The lowest scores were found for students with SID which were significantly different from all other types of SEN (all $ps < .001$).

There was a significant main effect of educational level on the ratings across the repeated measurements, $F(2, 1\ 627) = 5.798, p = .003, \eta^2 = .01$. Post hoc comparisons indicated that the ratings of secondary school teachers significantly differed from the other groups of teachers ($p_{\text{SEC-PRIM}} = .012; p_{\text{SEC-VOC}} = .034$) while no significant differences were found between the ratings of primary and vocational teachers.

The interaction between educational level and type of SEN on the ratings of teachers were significant as well $F(4.243, 3\ 451.71) = 5.290, p < .001, \eta^2 = .01$. These findings suggest the relationship between types of SEN and teachers' scores on the *belief in inclusion* scale depend on the educational levels of their working context. Post hoc comparisons indicated that primary and secondary level teachers had the highest mean scores for LD and that the scores significantly differed from the scores for all

other types of SEN (all $ps < .001$). The second highest scores were found for MID, but these scores did not significantly differ from the scores for EBD. The lowest scores were found for SID, which significantly differed across the repeated measurements (all $ps < .001$). For vocational level teachers, the highest mean score was found for LD that was significantly different from the mean scores of EBD and SID ($p_{LD-EBD} = .001$; $p_{LD-SID} < .001$), while there was no difference between the mean scores of LD and MID ($p_{LD-MID} = .068$). The means between MID and EBD revealed no significant difference ($p_{MID-EBD} = .373$). The lowest score was found for SID, and that score significantly differed from all other types of SEN (all $ps < .001$).

Discussion

The purpose of the present study was to investigate the relationship between the educational levels (operationalized by institutional affiliation) and teachers' attitudes toward inclusive education. Furthermore, the study aimed to explore to what extent educational levels were related to teachers' attitudes toward the inclusion of students with different types of SEN.

There was a significant relationship with a small effect size between the educational levels and three attitude subscales that explained 4 % of overall variability in the multivariate model, hence, hypothesis 1 can be confirmed. Further analyses suggested the multivariate effect to be mainly based on the moderate effect of educational level on teachers' *optimism* toward inclusion. Significant post hoc comparisons showed that teachers' *optimism* decreased from primary to secondary to vocational level. Although subsequent univariate analyses suggested significant associations with small effect sizes between educational levels and teachers' *beliefs in inclusion* and their perceived *own abilities*, the associations may be related to

significant different ratings of teachers working at a certain education level (e.g. *belief in inclusion*: secondary teachers; *own abilities*: vocational teachers). The results indicated that teachers working at vocational colleges showed the lowest rating on their *optimism* and *own abilities*. Thus, vocational level teachers felt to be the most unprepared and unsupported group of teachers with regard to inclusive practices in their institutional contexts and perceived competencies. This difference may be explained by quantitative and qualitative differences in their experiences with SEN students. Teachers of vocational colleges teach less than 1 % of students with SEN (Federal Ministry of Educational Research, 2016). However, their ratings on the *belief in inclusion* subscale indicated that their unfavorable attitudes with respect to their *optimism* and *own abilities*, and their lack of experiences working with students with SEN appeared to have no effect on their personal beliefs about the idea of inclusion.

In contrast to the other subscales, teachers' *belief in inclusion* showed the highest ratings and smallest differences across all educational levels. Apparently, teachers across all groups believed key features of inclusive education should be addressed in their schools. Unexpectedly, teachers working at secondary institutions showed significant lower ratings compared to the other two groups. An explanation for this difference could be based on the operationalization of the independent variable, since secondary education in Germany is comprised of a variety of heterogeneous types of educational institutions.

Significant relations with moderate effect sizes emerged for the within-group-factor type of SEN for all mixed design ANOVAs confirming hypothesis 2a. Teachers' attitude scores were consistently the lowest for the inclusion of students with SID, followed by EBD, LD and MID. However, this finding was not consistent with the previous research or with our assumption of hypothesis

2b. Previous research by Schwab and Seifert (2015) and Schwab et al. (2012) and by Avramidis and Norwich (2002) suggested that teachers showed the most negative attitudes toward students with EDB compared to students with SID, MID, LD and physical disabilities. Thus, despite the findings indicated significant associations, we rejected hypothesis 2b because the lowest scores revealed in the teachers' ratings for students with SID.

Significant interactions between type of SEN and educational levels also emerged from all mixed-design ANOVAs; thus, hypothesis 2c can be confirmed. Ordinal interactions for the dependent variables *own abilities* and *belief in inclusion* showed significant differences between educational levels (hypothesis 1a). Post hoc comparisons suggested that the ratings regarding students with SID might be characterized as outliers in comparison to the other measurement points. Hence, the ratings for students with SID negatively influenced the mean scores of multivariate group comparisons. Differences in teachers ratings on the *own abilities* scale across educational levels and measurement points suggested that the strength of the relationship between teachers' ratings and different types of SEN decreased from primary to vocational level. Unexpectedly, primary level teachers showed no differences in their *optimism* toward the inclusion of students with EBD and SID. Secondary level teachers' ratings for students with EBD were significantly different from the other measurement points, while vocational level teachers' ratings revealed no significant differences with regard to students with EBD, MID and LD. This pattern might be based on differences between externalizing symptoms of children and young adolescents with EBD (Petersen, Bates, Dodge, Lansford, & Pettit, 2015). Although teachers of all levels rated the items based on identical stimulus material (items, vignettes and labels), teachers working with older students might relate

their ratings to different personal experiences.

In contrast to studies which reported neutral to positive attitudes (Avramidis & Kalyva, 2007; Avramidis & Norwich, 2002; Gebhardt, Schwab, Nusser, & Hessels, 2015), teachers' ratings on their *optimism* were below the theoretical mean. Further analysis revealed that apart from primary teachers' *optimism* related to students with LD and MID, the average ratings of all groups were constantly below the theoretical mean. This result confirms findings of studies that reported slightly negative attitudes (de Boer et al., 2011). On average, the ratings on teachers' *belief in inclusion* and their *own abilities* were consistently above the theoretical mean. As the *optimism* scale assesses professional readiness and teachers' considerations about the feasibility of inclusive practices in their working contexts, this result may be explained by contextual limitations of their working environments.

Limitations

The operationalization of different types of SEN by vignettes and labels contradicts conceptualizations of inclusion that emphasizes the importance of heterogeneous learning environments without focus on labels (Ainscow, Booth, & Dyson, 2006; Boban & Hinz, 2003). Positions focusing the deconstruction of differences between types of SEN and the elimination of special education placements face other definitions that emphasize the need for continuous and evidence based support services for students with unique and partially well documented SEN. Fuchs and Fuchs (1998) stated that different positions were based on arguments that refer to different populations: e.g. students with high-incidence disabilities (e.g. LD, EBD and MID) or low-incidence disabilities (e.g. students with SID). Specifications of types of SEN should therefore be controlled in attitude research conducted with

teachers. Apart from regional (legal) terms for categories, the wording of the survey includes intercultural accepted and well-known terminologies.² The case vignettes were developed in accordance with phenomenological differences (American Psychiatric Association, 2013; Hollenweger, 2013) and pretested (Przibilla et al., 2016). The item formats and stimuli information helped to reduce the complexity of inclusive education and to ensure understandability of inclusion for the purpose of an online-survey. Although this might lead to an oversimplifying operationalization of inclusive education, the results indicated this approach was appropriate to gain differentiated information on attitude components toward students with different SEN.

There are also methodological limitations. Taking the large sample-size into account, small effect sizes ($\eta^2 = .01$) and significant test results with respect to the univariate effect of educational level on teachers' *belief in inclusion* and the interactions of educational level and type of SEN on teachers' *own abilities* and *belief in inclusion* may have emerged randomly. Additionally, in this study the subscale *belief in inclusion* reached a relatively low reliability of $\alpha = .52$. Although this reliability is still acceptable for group comparisons, the scale shows lower psychometric quality compared to the other attitude subscales. This may explain the slight differences between groups and measuring points emerged for this scale. Since the results regarding teachers' *belief in inclusion* showed consistent positive scores (mean scores between 3.06 and 3.15), this limitation may not result in substantive implications.

Limitations regarding the generalizability of results related to the online-survey must be considered in further interpretations. Errors based on invalid measurements may affect inferences from individual responses (level of data) to the group of participants

(level of sample). Sampling errors may affect the inference from participants' characteristics (level of sample) to the population of interest (level of population) (Fowler, 2014). Possible problems of invalidity were dealt with qualitative and quantitative pretest analyses of the survey instrument (Przibilla et al., 2016). However, sampling errors need to be considered in the interpretation of the results. Sampling errors (e.g. through systematic non-response) may be caused by motivational and organizational reasons of school administrators and teachers. Selective forwarding of information about the survey and systematic non-response bias caused by motivation of teachers were addressed by the described incentives. A full sample approach was considered as appropriate way to gain information of teachers from all institutional context because there was no possibility for random sampling of teachers and no possibility to oblige to participation of them in this study. The percentages of institutions represented in the sample (primary schools: 42 %, secondary education: 49 %, vocational colleges: 9 %) and target population (primary schools: 53 %, secondary education: 39 %, vocational colleges: 8 %) showed comparable proportions regarding the educational level. Additionally, the mean ages of the participants ($M = 45$) were comparable to the mean ages of teachers in North Rhine-Westphalia ($M = 46$; Ministry of School and Education in North Rhine-Westphalia, 2016). These aspects of comparability between the sample recruited for this study and the target population underline the possibility for a generalization of the presented results.

Implications

Training programs for in-service teachers and teacher-trainees are considered as promising approaches to improve professional development (Richter, 2016) and to promote the

² Survey design and validation included the development of two language versions for the purpose of intercultural comparisons of teachers' attitudes in Germany and the United States.

successful implementation of inclusive education (Norwich & Nash, 2011). Our findings may contribute to design tailor-made programs of in-service trainings for teachers working at different school environments. Teachers working at higher educational levels may profit from training procedures that are more compatible to their attitudinal evaluation. As the results show a lower association between SEN-based student characteristics and attitude scores for teachers at vocational level, trainings that focus on general instructional strategies may be more compatible and successful than programs that focus on inclusive strategies for students with specific SEN. Additionally, the correlational relationships between both independent variables (educational levels and types of SEN) and the interaction suggest that teachers' attitudes may be affected positively by promoting more heterogeneous student constellations at all educational levels.

The findings indicate a statistically meaningful relationship between teachers' attitudes toward inclusion and the educational levels they are working at. The educational level as a variable was operationalized by three categories. Each category may comprise different subtypes of schools. Especially, the secondary level includes several types of educational institutions with various student constellations and academic objectives (Standing Conference of the Ministers of Education, 2014). As a result, the attitudes of teachers working at secondary schools may not be as homogeneous as indicated and differing attitudes of teachers from diverse institutional contexts may balance each other in the presented study. Teachers of schools with higher percentage of students with SEN who prepare students for various degrees (e.g. general schools) may have more positive attitudes toward inclusion than teachers of schools with lower percentage of student with SEN who prepare students for tertiary education (e.g. grammar schools). Thus, further research is needed in order to identify potential differences between the types of secondary schools.

Teachers' attitudes may reflect different concepts of inclusion, such as an extremely simple or a rather complex understanding of inclusion. On one hand, teachers who view inclusion as placing students with SEN in general education classrooms (*placement definition*, Göransson & Nilholm, 2014) may have more positive attitudes toward inclusion although the concept is possibly quite unsophisticated. On the other hand, teachers who view inclusion as meeting the needs of all students and to create communities for all (*general individualized definition & community definition*, Göransson & Nilholm, 2014), may have more negative attitudes toward inclusion because this concept reflects a more sophisticated understanding of what constitutes inclusion. Although the findings may contribute to a better understanding of teachers' attitudes toward inclusion and to the development of advanced teacher trainings, there is a lack of research on teachers' conceptual understanding of inclusion. Those conceptual understandings are crucial for the interpretation of attitude self-assessments because they are strongly related to cognitive processes in which respondents are engaged when answering attitude surveys (e.g. question understanding, information retrieval and decision-making; Rosenberg & Hovland, 1969; Tourangeau, Rips, & Rasinski, 2000). For this reason, further research is needed which aims to evaluate the relationship between teachers' attitudes and their conceptual understanding of inclusion.

The present study focused on metric attitude-self-reports of a subsample of teachers who participated in the survey. However, the survey also included open-ended questions on teachers' conceptual knowledge about inclusion. Further mixed-method analyses of the data will contribute to explain potential associations between attitude-self-reports and participants' conceptual knowledge regarding inclusive education.

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