frontiers | Frontiers in Education

TYPE Original Research
PUBLISHED 30 June 2023
DOI 10.3389/feduc.2023.1157248

OPEN ACCESS

EDITED BY
David Pérez-Jorge,
University of La Laguna, Spain

REVIEWED BY
Jose Luis Ramos Sanchez,
Universidad de Extremadura, Spain
Ana Isabel González Herrera,
University of La Laguna, Spain
Eva Arino Mateo,
University of Valencia, Spain

*CORRESPONDENCE
Verena Hofmann
✉ verena.hofmann@unifr.ch

RECEIVED 02 February 2023
ACCEPTED 19 June 2023
PUBLISHED 30 June 2023

CITATION
Hofmann V (2023) Anxiety in students with intellectual disabilities: the influence of staff-perceived social acceptance and rejection in the classroom. *Front. Educ.* 8:1157248. doi: 10.3389/feduc.2023.1157248

Anxiety in students with intellectual disabilities: the influence of staff-perceived social acceptance and rejection in the classroom

Verena Hofmann*

Department of Special Education, University of Fribourg, Fribourg, Switzerland

Introduction: Students with intellectual disabilities often exhibit increased anxiety levels, which can be associated with additional limitations and severe emotional distress. This study investigated the role of social acceptance, social rejection, and general functioning in predicting anxiety.

Methods: Using data on 1,125 students in 179 special needs classrooms that was collected at the beginning and end of one school year, multilevel models were used to predict whether future anxiety was associated with prior staff-perceived social acceptance or rejection by classmates, and with general functioning.

Results: We found that greater staff-perceived social acceptance was related to a decrease in anxiety over the school year, however, no effect was found for rejection. Further, there was no moderating effect of students' general functioning.

Discussion: Positive peer relationships in the classroom appear to contribute to lower anxiety, while negative relationships do not further worsen anxiety. Implications for special needs schools are discussed.

KEYWORDS

social acceptance, social rejection, intellectual disability, general functioning, anxiety

Introduction

Elevated rates of anxiety are more prevalent in children and adolescents with intellectual disabilities than in their typically developing peers (Dekker and Koot, 2003; Emerson, 2003; Whitaker and Read, 2006). This pattern has been observed in both intellectual disability in general and for certain syndromes (Dykens, 2000; Royston et al., 2017), with prevalence rates varying between studies. For example, in a systematic review, Reardon et al. (2015) found prevalence rates of anxiety disorders in children and adolescents with intellectual disabilities ranging from 3 to 22%. High levels of anxiety can be associated with both reduced quality of life and distress in several ways. First, people affected by severe anxiety often experience diverse symptoms of emotional and physical discomfort (Hoffman et al., 2008; Barton et al., 2014). Children and adolescents with intellectual disabilities who already face cognitive and sometimes additional physical limitations may therefore be even more restricted in their actions. Furthermore, anxiety appears to be associated with higher levels of challenging

behavior and other behavioral problems (Pruijssers et al., 2014; Moskowitz et al., 2017) and lower levels of social acceptance and friendship quality (La Greca and Lopez, 1998). Challenging behavior is in turn a major factor in caregivers' and teachers' experience of stress (Jenkins et al., 1997; Brunsting et al., 2014; Amstad and Müller, 2020).

In order to better support children and adolescents with intellectual disabilities who exhibit high levels of anxiety, in-depth knowledge is needed on the factors that reinforce and mitigate anxiety. One important factor might be social relationships with peers. Similar to typically developing school-age children, social relationships with peers from school become increasingly important for students with intellectual disability as they grow older. Among typically developing children, there is evidence that positive social relationships (i.e., social acceptance) may have a mitigating effect on internalizing problems such as anxiety (Averdijk et al., 2014). Conversely, opposite effects were found for social rejection (Burks et al., 1995). However, it remains unclear whether these processes hold true for students with intellectual disabilities in special needs schools, who generally have smaller social networks than typically developing students (Schoop-Kasteler and Müller, 2020). Given these research gaps, it is important to examine the extent to which social acceptance and social rejection in the classroom are related to anxiety levels of students with intellectual disabilities in special needs schools and whether disability severity also has an influence.

Anxiety development in typically developing children begins in the first year of life and changes throughout childhood. At an early age, anxiety mainly relates to separation anxiety, fear of strangers and of animals, and fear of darkness and loud noises (Evans et al., 2005). As people grow older, anxiety takes on more complex forms, no longer relating only to situations perceived as immediately threatening but also to future events that involve, for example, school or work performance (Barton et al., 2014). The presence of anxiety is therefore consistent with typical emotional development (Evans et al., 2005). However, long-term excessive anxiety that significantly limits a person's daily activities may point to an anxiety disorder. According to DSM-5, a generalized anxiety disorder exists in case of "excessive anxiety and worry (apprehensive expectation), occurring on more days than not for at least 6 months, about a number of events or activities [. . .]" (American Psychiatric Association, 2013). In the general population, women are approximately twice as likely as men to be affected by generalized anxiety disorder (Stein and Sareen, 2015). Other forms of anxiety disorders include separation anxiety, specific phobia, social phobia, panic disorder, agoraphobia, obsessive-compulsive disorder, and post-traumatic stress disorder (American Psychiatric Association, 2013; Barton et al., 2014).

Previous studies have shown that anxiety disorders are more common in people with intellectual disabilities (Dekker and Koot, 2003; Emerson, 2003; Whitaker and Read, 2006). Reasons for increased anxiety can be multifaceted and have not been conclusively clarified. One reason could be limited cognitive abilities, which make it difficult to cope with everyday challenges and might thus lead to higher stress and anxiety. This reasoning would suggest that the more severe the disability, and thus the lower the person's adaptive skills, the greater their risk for increased anxiety. However, psychological, familial, social, and biological factors may further exacerbate or mitigate anxiety (Dykens, 2000). In addition, it is not always clear whether elevated levels of anxiety are one component of the clinical symptoms of a particular disability (e.g., a genetic syndrome) or whether they are part of normal, yet delayed, emotional development (Evans et al., 2005; Royston et al., 2017). In contrast to typically developing students, among people with intellectual disabilities there exists no clear evidence of a higher risk for anxiety among females. Depending on the genetic syndromes, the risk for females can be the same as or even lower than for males (Dykens, 2000).

According to the belongingness hypothesis, social relationships have strong effects on cognitive and emotional processes (Baumeister and Leary, 1995). Positive social relationships are associated with social acceptance, since social acceptance implies that other people wish to include that person in their relationships (Leary, 2010). Social acceptance and friendships at school are crucial for children and adolescents' development, and is positively associated with academic achievement (Delgado et al., 2016; Knifsend et al., 2018) and emotional well-being (Zurbriggen and Venetz, 2016), and negatively associated with challenging behavior (Zurbriggen and Venetz, 2016). With regard to anxiety, positive relationships with significant others have been shown to have a protective effect for children who have been victims of peer aggression (Averdijk et al., 2014). It can thus be assumed that low levels of social support or high levels of social rejection would have a deleterious effect. Indeed, social rejection has been found to generally enhance emotional distress (Blackhart et al., 2009). Further, Burks et al. (1995) found that persisting social rejection was related to increased anxiety, but only for boys. Although some evidence exists to support the assumption that social acceptance and rejection are relevant factors for anxiety development, the literature still lacks specific research on this subject, especially for students with intellectual disabilities in special needs schools. A systematic review of peer relationships among students with intellectual disabilities in special needs schools (Schoop-Kasteler and Müller, 2020) revealed that in general, social networks between these students are comparable to those of typically developing students. There was further evidence that students with better cognitive skills were more accepted and those with lower skills were more rejected, while no clear pattern was found regarding sex differences. In addition, students with intellectual disabilities in special needs schools were found to have fewer friends compared to typically developing students.

To extend the current state of research, the aim of this study was to investigate whether social acceptance in the classroom is related to a decrease in anxiety, and, conversely, whether social rejection is related to an increase in anxiety, over one school year among students with intellectual disabilities in special needs schools. We used a longitudinal observational design with two measurement points, one at the beginning of the school year and one at the end. We used a continuous measure of anxiety, since no clear diagnoses about anxiety disorders could be deduced from the available data. For social acceptance and rejection, the focus was on the extent of positive and negative social relationships within the class (i.e., how many classmates particularly liked or disliked a given student at the first measurement point). In addition, since anxiety is assumed to depend on cognitive abilities (e.g., Dykens, 2000), we were also interested in whether the effect of acceptance and rejection varies across different ability levels. Given we had no access to clinical measures about intellectual disability severity or IQ scores, we used

a composite score of adaptive competences, which were measured in the current study, to assess levels of general functioning. No clear hypotheses could be derived based on the state of the research; thus, we conducted exploratory analyses. Although the literature suggests that anxiety is related to sex and age, no clear evidence exists for the direction of these effects in students with intellectual disabilities. We therefore included sex and age as control variables in our analyses.

School staff reported on students' characteristics at two measurement points, once at the beginning of the school year and once at the end (T1: September–October 2018, T2: April–June 2019). We relied on staff reports since we also aimed to include students with more severe intellectual disabilities in the study who would have limited ability to provide adequate information about their behavior and social relationships. Staff providing information were teachers and other staff members who had to be very familiar with the respective student. In general, staff reports can be regarded as valid for assessing students' behavior (e.g., Einfeld and Tonge, 1995; Harrison and Oakland, 2015) but are less common in assessing social acceptance and rejection. Among typically developing students it was found that teacher-reported and students' self-reported peer nominations were only partially consistent (e.g., Schoop-Kasteler and Müller, 2021). It is yet assumed that in a special education context with smaller classrooms, closer supervision and support of students, and staff trained in special needs education, more reliable staff assessments might be possible. However, since we could not test for student-staff agreement in the current study, we use the terms "staff-perceived social acceptance and rejection" when describing our measures and results to clarify that we can only draw conclusions based on the perspective of reporting staff.

Materials and methods

Participants

The data used for the current study was part of a larger research project that examined characteristics and peer relations among students with intellectual disabilities in 16 special needs schools in the German-speaking part of Switzerland (Müller et al., 2020). Attendance at these schools requires a clinical diagnosis that meets ICD-10 criteria for intellectual disability (World Health Organization [WHO], 2004). School staff reported on students' characteristics at two measurement points, once at the beginning of the school year and once at the end (T1: September–October 2018, T2: April–June 2019). Overall, 1,125 students (out of 1,177 in total) from 179 classrooms (out of 182 in total) took part in the study, which indicates a participation rate of 95.58%. Further, of the 1,096 students for whom a questionnaire was completed at T1, 1,039 also participated at T2. The reasons for non-participation were parental or staff decisions, and because the study was conducted completely anonymously, no information was available on non-participating students. Students' mean age at the first measurement point was 11.26 years (SD = 3.76; range = 4.17–19.08) and 69% of the sample were boys.

We relied on staff reports (i.e., each questionnaire of a student was completed by one staff member) since we also aimed to include students with more severe intellectual disabilities in the study who would have limited ability to provide adequate information about their behavior and social relationships. Staff providing information were teachers and other staff members who had to be very familiar with the respective student. In general, staff reports can be regarded as valid for assessing students' behavior (e.g., Einfeld and Tonge, 1995; Harrison and Oakland, 2015) but are less common in assessing social acceptance and rejection. Among typically developing students it was found that teacher-reported and students' self-reported peer nominations were only partially consistent (e.g., Schoop-Kasteler and Müller, 2021). It is yet assumed that in a special education context with smaller classrooms, closer supervision and support of students, and staff trained in special needs education, more reliable staff assessments might be possible. However, since we could not test for student-staff agreement in the current study, we use the terms "staff-perceived social acceptance and rejection" when describing our measures and results to clarify that we can only draw conclusions based on the perspective of reporting staff. Of the 366 school staff members reporting on students at T1, 72.7% were class teachers or co-teachers and 22.9% were other staff (e.g., subject-specific teachers, assistants, trainees, social pedagogues, or therapists), with no information available for 4.4%. All reporting staff worked in the classroom alongside the teacher and therefore were in close contact with the students on a daily basis. The trainees were long-term apprentices who were permanently assigned to a classroom over a longer period of time and they have worked with the particular student for between 1 and 13 months.

TABLE 1 Overview of the items on the anxiety subscale of the Developmental Behavior Checklist for Teachers.

Cries easily for no reason over small things.
Is distressed about being alone.
Is excessively distressed if separated from a familiar person.
Fears particular things or situations (e.g., the dark and insects).
Is a picky eater.
Experiences loss of appetite.
Is shy.
Becomes upset and distressed over small changes in routine or environment.

Measures

Anxiety

Anxiety was measured at T1 and T2 using a subscale of the German version of the Developmental Behavior Checklist for Teachers (DBC-T; Einfeld et al., 2007). The subscale consists of 8 items that refer to various forms of anxiety, including generalized anxiety disorder, separation anxiety, social anxiety, fears, and phobias (see **Table 1** for an overview). School staff estimated the occurrence and severity of each item over the prior 2 months, using a three-point Likert scale (e.g., "is shy": 0 = *not true*, 1 = *somewhat true or sometimes true*, 2 = *very true or often true*).

Both the original DBC-T English version and the German translation have been thoroughly evaluated in international studies (Einfeld and Tonge, 1995; Dekker et al., 2002;

Steinhausen and Metzke, 2005). The internal consistency of the subscale, as calculated by the current data, was α = 0.73 at T1 and α = 0.70 at T2. For statistical analyses, item scores were combined to create a mean raw score of anxiety for each student.

Social acceptance/social rejection

Staff-perceived social acceptance and *rejection* were measured at the beginning of the school year (T1) as the number of nominations a student received from classmates (from the perspective of the reporting staff) for being liked or disliked. For each student, we asked teachers and other collaborators to list which students from the class that particular student would report as liking a lot (i.e., "who does this student like especially in school?") and liking little (i.e., "who does this student not like so much in school?") using a single-items approach. Since the number of nominations was limited only by classroom size, percentages were calculated as a measure of social acceptance and rejection in the class (number of nominations divided by number of classmates multiplied by 100).

Control/moderator variables

Staff reports were also used to assess students' sex, age, and general functioning. General functioning was measured at T1 using the Adaptive Behavior Assessment System-3 for teachers (ABAS-3; Harrison and Oakland, 2015; Bienstein et al., 2018). The ABAS-3 consists of a total score composed of 174 adaptive behavior items across three domains (conceptual, social, and practical competences), and general functioning can be inferred by comparing the total score to a reference norm. The reference norm is based on a representative sample of 1,896 persons from the general US population. The norms provided by the ABAS-3 test manual (Harrison and Oakland, 2015) allow for categorization of general functioning into "extremely low," "low," "below average," "average," "above average," and "high." Since only 10 students in the present sample were assigned to the "high" category, a combined "average plus" category was created for the group comparisons, which also included the students with the high scores.

Procedure

The present study was reviewed and approved for scientific procedure and ethical conduct by the Institutional Research Commission of the Department of Special Education at the University of Fribourg. The commission evaluated the project with reference to the guidelines published by the University of Fribourg, the Ethical Principles of Psychologists and Code of Conduct (American Psychological Association, 2017), and the Declaration of Helsinki (World Medical Association, 2013). Access to study subjects was secured via informational letters sent to each special needs school and subsequent personal consultations with the school directors, after which parents were sent letters informing them of the nature of the study. Data collection was completely anonymous, such that the researchers never had access to the names of any reporting school staff, parents, or students. Numerical codes were used to link data from the two measurement points. Parents were informed by letter that the study was anonymous, no information on medical diagnoses were collected, and participation was voluntary. They were free to inform the class teacher if they did not wish for anonymous information about their child to be provided to the research team.

Data collection took place at the schools. Staff members who were familiar with the students filled in the paper-pencil questionnaires individually, following an introduction to the questionnaires by a collaborator of the research project. This procedure was conducted at T1 (autumn 2018) and T2 (spring 2019). Since this was not an intervention study, there were no guidelines or restrictions from the research team on learning content and student support between the two measurement points.

Data analyses

Before testing our hypotheses, we conducted preliminary analyses of descriptive statistics, frequencies, and correlations between all variables. Since students were nested in classrooms, we conducted multilevel modeling using the software Mplus Version 8.0 (Muthén and Muthén, 2017) for the main analyses, with students at Level 1 and classrooms at Level 2. This approach allows the standard errors to be estimated correctly despite the hierarchical data structure, and is therefore necessary to avoid biased significance tests, even if (as in the current study) all variables are assigned to the individual level (Raudenbush and Bryk, 2002). We ran random intercept models, where the intercept is allowed to vary across Level 1 units (students) and Level 2 units (classrooms). The software Mplus further allowed us to use maximum likelihood parameter estimates with robust standard errors (MLR). Even in the case of non-normality and heteroskedasticity in the data, the robust standard errors approach provides unbiased estimates (Muthén and Muthén, 2017).

To test the effect of social relations on anxiety, two models were calculated: one containing the predictor staff-perceived social acceptance and another containing the predictor staff-perceived social rejection. Since we were interested in anxiety development, we predicted T2 anxiety while controlling for the T1 score. Sex, age, and general functioning were included as control variables. We further performed exploratory analyses to investigate a potentially moderating effect by including the interaction term between staff-perceived social acceptance/rejection and general functioning.

Results

Table 2 presents descriptive statistics and correlations of all variables used in the main analyses. As can be seen, the sample's mean anxiety score was 0.42 (SD = 0.38) at T1 and 0.39 (SD = 0.35) at T2 (scale range 0–2). Results of a Wald test conducted in Mplus revealed a significant decrease in anxiety from T1 to T2 [$\chi^2(1) = 8.88$, $p = 0.003$). Mean staff-perceived social acceptance at T1 was 20.49 (SD = 22.76) and mean social rejection was 7.62 (SD = 16.63). This means that students were, on average, especially liked by 20.49% of the classmates and disliked by 7.62%. Although rejection was clearly lower than acceptance, the large standard deviations indicate that social relationships differed a lot between classrooms. Regarding general functioning, 47.2% exhibited extremely low levels of adaptive competences, 20.5% were in the low range, and 22.8% below average. Yet, 9.5% of the students demonstrated at least average levels of general functioning.

TABLE 2 Descriptive statistics and correlations between variables.

Variable	*N* (valid)	*M* (%)	SD	1	2	3	4	5	6	7
1. T1 anxiety	1,090	0.42	0.38	–						
2. T2 anxiety	1,057	0.39	0.35	0.63**	–					
3. T1 social acceptance	1,131	20.49	22.76	0.02	−0.05	–				
4. T1 social rejection	1,131	7.62	16.63	0.02	0.07*	−0.22**	–			
5. T1 general functioning†	987	–	–	−0.19**	−0.15**	0.12**	−0.12**	–		
Extremely low	466	47.2		–	–	–	–	–		
Low	202	20.5		–	–	–	–	–		
Below average	225	22.8		–	–	–	–	–		
Average plus	94	9.5		–	–	–	–	–		
6. Male sex	1,125	69	–	0.02	0.05	−0.10**	0.06	−0.06	–	
7. T1 Age	1,100	11.26	3.76	−0.17**	−0.15**	0.03	0.06	0.07*	−0.4	–

†Kendall's tau for ordered categorical variables was used to estimate the correlation between general functioning and other variables. *$p < 0.05$, **$p < 0.01$.

Table 2 indicates a significant and high positive correlation (according to Cohen, 1988) between T1 and T2 anxiety ($p < 0.01$; $r = 0.63$). The only significant (but small) correlation between anxiety and social status was between T2 anxiety and staff-perceived social rejection, indicating that higher levels of rejection were related to higher levels of anxiety at T2 ($p < 0.05$; $r = 0.07$). Further, higher levels of general functioning were associated with lower levels of T1 anxiety ($p < 0.01$; $r = -0.19$), T2 anxiety ($p < 0.01$; $r = -0.05$), and staff-perceived social rejection ($p < 0.01$; $r = -0.12$), as well as higher levels of staff-perceived social acceptance ($p < 0.01$; $r = 0.12$). Male sex showed a small negative association with acceptance only ($p < 0.01$; $r = -0.10$), indicating that males were less accepted than females. Higher age was associated with lower anxiety at T1 ($p < 0.01$; $r = -0.17$) and T2 ($p < 0.01$; $r = -0.17$), and higher general functioning ($p < 0.05$; $r = 0.07$); however, all effects were small.

In our main analyses, we tested the hypotheses that (1) higher staff-perceived social acceptance in the classroom (i.e., more nominations of being liked in the classroom) is related to a decrease in anxiety over the school year, and that (2) higher staff-perceived social rejection (i.e., more nominations of dislike in the classroom) is related to an increase in anxiety. Further exploratory analyses on a potential moderating effect of differing levels of general functioning were conducted.

Table 3 presents the results of the random intercept models for the prediction of T2 anxiety by T1 staff-perceived social acceptance, controlling for T1 anxiety, general functioning, sex, and age. This model indicates that higher acceptance at the beginning of the school year (T1) is related to a decrease in anxiety at the end of the school year ($p < 0.05$; $\beta = -0.058$). Hence, Hypothesis 1 was accepted. Further, T1 anxiety was significantly related to T2 anxiety ($p < 0.001$; $\beta = 0.617$). This means that despite the overall decrease in anxiety among the total sample, those who scored higher at T1 also scored higher at T2. When the different levels of general functioning were compared, all lower levels of functioning were related to higher anxiety compared to students with average or higher levels of general functioning (from $p < 0.05$ to $p < 0.01$). Sex and age differences in anxiety were not found. Variance components indicate a significant amount of variance existed at both levels (between classrooms: $p < 0.05$; between students: $p < 0.001$), which was not accounted for by the variables included. A moderator effects model was conducted to explore whether the effect of staff-perceived social acceptance varies between different levels of general functioning, however, none of these interaction effects were significant (see Table 3). The effects of the variables not included in the interaction terms did not reveal relevant changes to the main effects only model.

In contrast to acceptance, Table 4 shows that staff-perceived social rejection had no significant effect on anxiety T2. Hypothesis 2, which assumed anxiety would increase with increasing levels of rejection, was therefore not supported. The significance of the other effects was identical to the social acceptance model, with the exception of a small but significant age effect ($p < 0.05$; $\beta = -0.063$) that indicates lower anxiety with increasing age. As with acceptance, no interaction effects were found between general functioning and staff-perceived social rejection in the moderator effects model (see Table 4). However, there were significant simple effects for general functioning (i.e., the effect of general functioning when rejection is equal to zero). These effects indicate that for extremely low ($p < 0.01$; $\beta = 0.134$), low ($p < 0.05$; $\beta = 0.080$), and below average ($p < 0.01$; $\beta = 0.107$) levels of general functioning, a larger increase in anxiety occurs over time compared to average or higher levels of functioning, even if the student received zero dislike nominations. The absence of rejection therefore does not diminish the difference in anxiety between ability groups. In comparison, there were no significant differences in T2 anxiety between general functioning levels when staff-perceived social acceptance was zero (see simple effects in Table 3).

Discussion

The current study sought to investigate the relationship between staff-perceived social acceptance and rejection and the development of anxiety over one school year among students with intellectual disabilities attending special needs schools. Preliminary analyses revealed a small decrease in

TABLE 3 Random intercept models to predict anxiety by staff-perceived social acceptance, general functioning, age, and sex.

Parameters	Main effects only				Moderator effects			
	B	SE	*p*	β	*B*	SE	*p*	β
Fixed effects								
Intercept	0.141	0.049	0.004	–	0.148	0.062	0.017	–
T1 anxiety	0.562	0.035	<0.001	0.617	0.560	0.035	<0.001	0.615
T1 social acceptance	−0.001	0.000	0.030	−0.058	−0.001	0.001	0.404	−.073
T1 general functioning								
Extremely low†	0.085	0.029	0.004	0.124	0.084	0.049	0.088	0.123
Low†	0.077	0.032	0.016	0.091	0.080	0.057	0.157	0.095
Below average†	0.078	0.030	0.010	0.097	0.049	0.048	0.308	0.061
Extremely low × social acceptance	–	–	–	–	0.000	0.001	0.995	0.000
Low × social acceptance	–	–	–	–	0.000	0.002	0.914	0.007
Below average × social acceptance	–	–	–	–	0.001	0.001	0.399	0.053
Male sex	0.027	0.018	0.150	0.036	0.027	0.019	0.140	0.037
T1 age	−0.005	0.003	0.059	−0.059	−0.005	0.003	0.054	0.060
Variance components								
Level 1	0.068	0.005	<0.001	–	0.068	0.005	<0.001	–
Level 2	0.007	0.003	0.012	–	0.007	0.003	0.014	–

†Reference category = average plus.

TABLE 4 Random intercept models to predict anxiety by staff-perceived social rejection, general functioning, age, and sex.

Parameters	Main effects only				Moderator effects			
	B	SE	*p*	β	*B*	SE	*p*	β
Fixed effects								
Intercept	0.119	0.048	0.013	–	0.112	0.048	0.020	–
T1 anxiety	0.560	0.034	<0.001	0.614	0.562	0.035	<0.001	0.615
T1 social rejection	0.001	0.001	0.080	0.050	0.002	0.003	0.466	0.113
T1 general functioning								
Extremely low†	0.085	0.029	0.004	0.124	0.092	0.030	0.002	0.134
Low†	0.074	0.032	0.019	0.088	0.068	0.033	0.043	0.080
Below average†	0.077	0.031	0.012	0.096	0.086	0.033	0.008	0.107
Extremely low × social rejection	–	–	–	–	−0.002	0.003	0.619	−0.063
Low × social rejection	–	–	–	–	0.000	0.003	0.999	0.000
Below average × social rejection	–	–	–	–	−0.002	0.003	0.529	−0.044
Male sex	0.029	0.018	0.112	0.039	0.029	0.018	0.113	0.039
T1 age	–0.006	0.003	0.043	−0.063	−0.006	0.003	0.049	−0.061
Variance components								
Level 1	0.068	0.005	<0.001	–	0.068	0.005	<0.001	–
Level 2	0.006	0.003	0.016	–	0.006	0.003	0.019	–

†Reference category = average plus.

anxiety over the school year. This finding could be mapped to the theoretical assumption that anxiety diminishes with age (e.g., Evans et al., 2005). However, in contrast to the change in anxiety over time that was observed in the overall sample, the effect of individual age was only partially significant.

Our first hypothesis assumed that higher staff-perceived social acceptance would be associated with a decrease in anxiety over the school year, which was supported by the results. Although, to our knowledge, no earlier studies investigated specifically the relationship between social acceptance and anxiety development in students with intellectual disabilities, the finding is in line with studies on emotional well-being (e.g., Zurbriggen and Venetz, 2016) and anxiety among children who have been victims of peer aggression (Averdijk et al., 2014). Social acceptance means that other people wish to include that person in their relationships (Leary, 2010). Positive social relationships, for their part, provide a protective and supportive environment that gives an individual a feeling of security and belonging which may counteract anxiety (see also, Baumeister and Leary, 1995).

The second hypothesis, that higher staff-perceived social rejection (i.e., an increased percentage of nominations of being disliked) is related to an increase in anxiety over the school year, was not supported by the current study results. Prior study results have been heterogeneous, as results were either mixed (e.g., only an effect for boys; Burks et al., 1995) or more generalized (e.g., emotional condition instead of anxiety; Blackhart et al., 2009). It is possible that a higher level of rejection has a comparable effect to a lower level of acceptance, so that only a higher level of acceptance makes the difference and rejection does not further increase anxiety. However, such mechanisms cannot be conclusively determined here and require further investigation.

Regarding general functioning, we found increased anxiety among all lower functioning groups compared to the group comprised of average or higher-than-average functioning students, which is in line with earlier studies (e.g., Dykens, 2000). These differences were more stable across analyses than the effect of age. While anxiety might be highly related to age among typically developing children (e.g., Evans et al., 2005), the reasons for increased anxiety among children with intellectual disabilities are thought to be multifaceted and can relate to specificities of the disability or delayed emotional development (Evans et al., 2005; Royston et al., 2017). However, despite observing differences in anxiety between higher and lower functioning students, the influence of staff-perceived social acceptance and rejection on anxiety did not appear to vary by level of general functioning. Thus, the data do not suggest that students with lower adaptive skills are more or less susceptible to the influence of social acceptance and rejection. We further found no differences in anxiety between boys and girls when controlling for all other variables in the models, which is in line with prior literature on sex differences in anxiety among people with intellectual disabilities, and which stands in contrast to patterns seen in the general population, where a clear tendency is observed of a greater risk for anxiety disorders among women (Dykens, 2000; Stein and Sareen, 2015).

Study implications

The current study found staff-perceived social acceptance among classmates plays a significant role in anxiety development among students with intellectual disabilities attending special needs schools. Although the study design does not allow for causal conclusions, it can be assumed that being liked by a larger proportion of classmates could be one factor (alongside several other factors not investigated here) that contributes to a decrease in anxiety. Positive peer relationships at school are known to be associated with numerous benefits, including improved academic skills, overall well-being, reduced problem behaviors (Delgado et al., 2016; Zurbriggen and Venetz, 2016; Knifsend et al., 2018), and, as we found in the current study, also with decreased anxiety. The development of these relationships requires sufficient social contact and social interaction among students, yet students with intellectual disabilities in special needs schools on average have fewer friends than typically developing students (Schoop-Kasteler and Müller, 2020). Since disability severity can be a limiting factor in relationship development, teachers play an important role in promoting social interactions between students (e.g., Farmer et al., 2011, 2019). Of note, staff-perceived social rejection did not appear to be associated with additional worsening of anxiety. We therefore posit that the positive relationships created through social contact are more significant than the negative relationships that might also occur. However, more studies among students with intellectual disabilities are needed to draw solid conclusions.

Strengths, limitations, and future directions

This longitudinal study added to the current state of research on anxiety among students with intellectual disabilities in special needs schools and the role of staff-perceived social acceptance and rejection in the classroom. Strengths included the study's longitudinal design, large sample size, high participation rate, and the inclusion of lower- and higher-functioning students. Including students with varying ability levels allowed us to draw conclusions about a broad population of students with intellectual disabilities and to investigate differences between levels of general functioning.

However, including students with more severe intellectual disabilities also necessitated the use of assessments based on information provided by school staff and not by students themselves. Although staff reports are considered reliable and valid for assessing certain behaviors (e.g., Einfeld and Tonge, 1995; Harrison and Oakland, 2015), this approach is less common for peer nominations. Most studies that have examined peer relations in samples of typically developing children and adolescents used self-reported data (e.g., Cillessen and Marks, 2017). The use of self-reports was yet not feasible in this study, as many students would have had limited ability to provide adequate information about their social relationships, thereby narrowing the sample to include only students with mild intellectual disability. Among typically developing students, findings indicate there is only partial agreement between self and teacher reports regarding peer nominations (Schoop-Kasteler and Müller, 2021). Yet, there might be better agreement in the special education context, since these students are supervised much more closely. Although there already exist promising evaluation studies on teacher reports on peer relations (for an overview, see Hamm and Hoffman, 2016), a more detailed investigation of this approach is still needed (e. g., comparison of professionals' nominations with nominations made by students with mild intellectual disability). In the context of the present study, it must also be noted as a limitation that trainees,

who were also permitted to fill in questionnaires, had in some cases only been working with the students for a few months.

A second limitation was this study's use of a broad measure of staff-perceived social acceptance and rejection (i.e., the percentage of nominations each student received in the class about being liked or disliked). Assuming that social support by peers might be a mechanism to reduce anxiety, social interactions between students should be assessed in more detail, for example, by using methods of systematic observation. Third, no causal conclusions can be drawn from the current results, as we conducted a longitudinal observational study and not an experimental study. Fourth, we found only a small effect size for both the influence of staff-perceived social acceptance and also for differences between the levels of general functioning with regard to anxiety development. Hence, although these results are statistically relevant, many other factors might influence anxiety too (e.g., familial factors, relationships with teacher, genetic syndrome, etc.).

There remain several directions for future research on this topic. The current study focused only on students in special needs schools, and further research should be conducted in inclusive settings, which are attended by a considerable proportion of students with intellectual disabilities in many countries. Furthermore, this study measured anxiety on a continuum and did not compare higher- and lower-risk groups. Future studies might investigate the impact of social relationships on problematic levels of anxiety, or compare samples with and without a diagnosis of anxiety disorder.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the author, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by the Institutional Research Commission of the Department of Special Education at the University of Fribourg. Written informed consent from the participants' legal guardian/next of kin was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

VH participated in the data collection, performed the data analyses, and wrote the text of the manuscript.

Funding

This study was supported by the Swiss National Science Foundation (grant number 172773).

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders*, 5th Edn. Virginia, US: American Psychiatric Association, doi: 10.1176/appi.books.9780890425596

American Psychological Association (2017). *Ethical principles of psychologists and code of conduct*. Virginia, US: American Psychiatric Association, doi: 10.1093/med:psych/9780199845491.003.0103

Amstad, M., and Müller, C. M. (2020). Students' problem behaviors as sources of teacher stress in special needs schools for individuals with intellectual disabilities. *Front. Educ.* 4:159. doi: 10.3389/feduc.2019.00159

Averdijk, M., Eisner, M., and Ribeaud, D. (2014). Do social relationships protect victimized children against internalizing problems? *J. Sch. Violence* 13, 80–99. doi: 10.1080/15388220.2013.842175

Barton, S., Karner, C., Salih, F., Baldwin, D. S., and Edwards, S. J. (2014). Clinical effectiveness of interventions for treatment-resistant anxiety in older people: A systematic review. *Health Technol. Assess.* 18, 1–62. doi: 10.3310/hta18500

Baumeister, R. F., and Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychol. Bull.* 117, 497–529. doi: 10.1037/0033-2909.117.3.497

Bienstein, P., Döpfner, M., and Sinzig, J. (2018). *Fragebogen zu den Alltagskompetenzen: ABAS-3. Deutsche Evaluationsfassung [Adaptive behavior assessment system: ABAS-3. German evaluation version]*. London: Pearson.

Blackhart, G. C., Nelson, B. C., Knowles, M. L., and Baumeister, R. F. (2009). Rejection elicits emotional reactions but neither causes immediate distress nor lowers self-esteem: A meta-analytic review of 192 studies on social exclusion. *Pers. Soc. Psychol. Rev.* 13, 269–309. doi: 10.1177/1088868309346065

Brunsting, N. C., Sreckovic, M. A., and Lane, K. L. (2014). Special education teacher burnout: A synthesis of research from 1979 to 2013. *Educ. Treat. Child.* 37, 681–711. doi: 10.1353/etc.2014.0032

Burks, V. S., Dodge, K. A., and Price, J. M. (1995). Models of internalizing outcomes of early rejection. *Dev. Psychopathol.* 7, 683–695. doi: 10.1017/S0954579400006787

Cillessen, A. H. N., and Marks, P. E. L. (2017). Methodological choices in peer nomination research. *New Direct. Child Adolesc. Dev.* 157, 21–44. doi: 10.1002/cad.20206

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*, 2nd Edn. London: Routledge.

Dekker, M. C., and Koot, H. M. (2003). DSM-IV disorders in children with borderline to moderate intellectual disability. I: Prevalence and impact. *J. Am. Acad. Child Adolesc. Psychiatry* 42, 915–922. doi: 10.1097/01.CHI.0000046892.27264.1A

Dekker, M. C., Nunn, R. J., Einfeld, S. E., Tonge, B. J., and Koot, H. M. (2002). Assessing emotional and behavioral problems in children with intellectual disability: Revisiting the factor structure of the developmental behavior checklist. *J. Autism Dev. Disord.* 32, 601–610. doi: 10.1023/A:1021263216093

Delgado, M. Y., Ettekal, A. V., Simpkins, S. D., and Schaefer, D. R. (2016). How do my friends matter? Examining latino adolescents' friendships, school belonging, and academic achievement. *J. Youth Adolesc.* 45, 1110–1125. doi: 10.1007/s10964-015-0341-x

Dykens, E. M. (2000). Annotation: Psychopathology in children with intellectual disability. *J. Child Psychol. Psychiatry Allied Discip.* 41, 407–417. doi: 10.1017/S0021963000005667

Einfeld, S. L., and Tonge, B. J. (1995). The developmental behavior checklist: The development and validation of an instrument to assess behavioral and emotional disturbance in children and adolescents with mental retardation. *J. Autism Dev. Disord.* 25, 81–104. doi: 10.1007/BF02178498

Einfeld, S. L., Tonge, B. J., and Steinhausen, H. C. (2007). *VFE: Verhaltensfragebogen bei Entwicklungsstörungen*. Göttingen: Hogrefe.

Emerson, E. (2003). Prevalence of psychiatric disorders in children and adolescents with and without intellectual disability. *J. Intell. Disabil. Res.* 47, 51–58. doi: 10.1046/j.1365-2788.2003.00464.x

Evans, D. W., Canavera, K., Kleinpeter, F. L., Maccubbin, E., and Taga, K. (2005). The fears, phobias and anxieties of children with autism spectrum disorders and Down syndrome: Comparisons with developmentally and chronologically age matched children. *Child Psychiatry Hum. Dev.* 36, 3–26. doi: 10.1007/s10578-004-3619-x

Farmer, T. W., Hamm, J. V., Dawes, M., Barko-Alva, K., and Cross, J. R. (2019). Promoting inclusive communities in diverse classrooms: Teacher attunement and social dynamics management. *Educ. Psychol.* 54, 286–305. doi: 10.1080/00461520.2019.1635020

Farmer, T. W., McAuliffe Lines, M., and Hamm, J. V. (2011). Revealing the invisible hand: The role of teachers in children's peer experiences. *J. Appl. Dev. Psychol.* 32, 247–256. doi: 10.1016/j.appdev.2011.04.006

Hamm, J. V., and Hoffman, A. S. (2016). "Teachers' influence on students' peer relationships and peer ecologies," in *Handbook of social influences in school contexts. Social-emotional, motivation, and cognitive outcomes*, eds K. R. Wentzel and G. B. Ramani (London: Routledge), 208–229.

Harrison, P. L., and Oakland, T. (2015). *ABAS-3: Adaptive behavior assessment system - Third Edition. Western Psychological Services*. London: Pearson.

Hoffman, D. L., Dukes, E. M., and Wittchen, H. U. (2008). Human and economic burden of generalized anxiety disorder. *Depress. Anxiety* 25, 72–90. doi: 10.1002/da.20257

Jenkins, R., Rose, J., and Lovell, C. (1997). Psychological well-being of staff working with people who have challenging behaviour. *J. Intell. Disabil. Res.* 41, 502–511. doi: 10.1111/j.1365-2788.1997.tb00743.x

Knifsend, C. A., Camacho-Thompson, D. E., Juvonen, J., and Graham, S. (2018). Friends in activities, school-related affect, and academic outcomes in diverse middle schools. *J. Youth Adolesc.* 47, 1208–1220. doi: 10.1007/s10964-018-0817-6

La Greca, A. M., and Lopez, N. (1998). Social Anxiety among Adolescents: Linkages with peer relations and friendships. *J. Abnorm. Child Psychol.* 26, 83–94. doi: 10.1023/A:1022684520514

Leary, M. R. (2010). "Affiliation, acceptance, and belonging: The pursuit of interpersonal connection," in *Handbook of Social Psychology*, eds S. T. Fiske, D. T. Gilbert, and G. Lindzey (Hoboken, NJ: John Wiley & Sons, Ltd), 864–897. doi: 10.1002/9780470561119.socpsy002024

Moskowitz, L. J., Walsh, C. E., Mulder, E., McLaughlin, D. M., Hajcak, G., Carr, E. G., et al. (2017). Intervention for anxiety and problem behavior in children with autism spectrum disorder and intellectual disability. *J. Autism Dev. Disord.* 47, 3930–3948. doi: 10.1007/s10803-017-3070-z

Müller, C. M., Amstad, M., Begert, T., Egger, S., Nenniger, G., Schoop-Kasteler, N., et al. (2020). Die Schülerschaft an Schulen für Kinder und Jugendliche mit einer geistigen Behinderung – Hintergrundmerkmale, Alltagskompetenzen und Verhaltensprobleme. *Emp. Pädagogik* 4, 347–368.

Muthén, L. K., and Muthén, B. O. (2017). *Mplus. Statistical analysis with latent variables. User's guide*, 8th Edn. Los Angeles, CA: Muthén & Muthén.

Pruijssers, A. C., van Meijel, B., Maaskant, M., Nijssen, W., and van Achterberg, T. (2014). The relationship between challenging behaviour and anxiety in adults with intellectual disabilities: A literature review. *J. Intell. Disabil. Res.* 58, 162–171. doi: 10.1111/jir.12012

Raudenbush, S., and Bryk, A. (2002). *Hierarchical linear models: Applications and data analysis methods*, 2nd Edn. Newcastle upon Tyne: Sage.

Reardon, T. C., Gray, K. M., and Melvin, G. A. (2015). Anxiety disorders in children and adolescents with intellectual disability: Prevalence and assessment. *Res. Dev. Disabil.* 36, 175–190. doi: 10.1016/j.ridd.2014.10.007

Royston, R., Howlin, P., Waite, J., and Oliver, C. (2017). Anxiety disorders in Williams syndrome contrasted. *J. Autism Dev. Disord.* 47, 3765–3777. doi: 10.1007/s10803-017-2909-z

Schoop-Kasteler, N., and Müller, C. M. (2020). Peer relationships of students with intellectual disabilities in special needs classrooms – a systematic review. *J. Res. Special Educ. Needs* 20, 130–145. doi: 10.1111/1471-3802.12471

Schoop-Kasteler, N., and Müller, C. M. (2021). Brief research report: Agreement between teacher and student reports on students' acceptance and rejection. *Front. Educ.* 6:726854. doi: 10.3389/feduc.2021.726854

Stein, M. B., and Sareen, J. (2015). Generalized anxiety disorder. *New Engl. J. Med.* 373, 2059–2068. doi: 10.1056/NEJMcp1502514

Steinhausen, H. C., and Metzke, C. W. (2005). Der verhaltensfragebogen bei entwicklungsstörungen (VFE): Psychometrische kennwerte und normierung. *Zeitschrift Für Klinische Psychol. Psychother.* 34, 266–276.

Whitaker, S., and Read, S. (2006). The prevalence of psychiatric disorders among people with intellectual disabilities: An analysis of the literature. *J. Appl. Res. Intell. Disabil.* 19, 330–345. doi: 10.1111/j.1468-3148.2005.00293.x

World Health Organization [WHO] (2004). *ICD-10: International statistical classification of diseases and related health problems: Tenth revision*, 2nd Edn. Geneva: World Health Organization.

World Medical Association (2013). World Medical Association declaration of Helsinki: Ethical principles for medical research involving human subjects. *JAMA* 310, 2191–2194. doi: 10.1001/jama.2013.281053

Zurbriggen, C., and Venetz, M. (2016). Soziale Partizipation und aktuelles Erleben im gemeinsamen Unterricht. *Emp. Pädagogik* 30, 98–112.