The Teacher-Student Relationship: A comparative study of the report of students with autism spectrum disorder and typical development.

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ABSTRACT:

The teacher-student relationship (TSR) is an essential factor in promoting academic success. Even though students with autism spectrum disorder (ASD) experience more educational difficulties, the TSR in ASD students has been understudied, and there is a significant empirical gap in the perception that ASD adolescent students themselves have of their relationships with their teachers.

The present study followed a non-experimental, correlational, cross-sectional, and comparative design to analyze the TSR in ASD adolescents in comparison to the TSR of their typically developing (TD) peers. Sixty-four students (33 females, 31 males) who were in their first year of secondary school (mean age: M=14.85, SD=.14) participated in the study. Thirty-two of them had ASD, and thirty-two had TD. The TSR subscale of the SEI was applied (Appleton et al., 2006).

The results show significant interaction effects between student condition and gender, where female ASD students reported a poorer quality relationship than their male ASD peers. These findings differ from existing research indicating that ASD students experience poorer quality TSR and that female students experience better relationships than male students. The critical role of the existing school integration program in Chilean schools and guidelines for future research to explain the gender differences found in this study are discussed.

Keywords: Autism Spectrum Disorder, Teacher-Student Relationship, Special Educational Needs, Typical Development

INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by difficulties in communication and social interaction and restrictive patterns of behavior (American Psychiatric Association, 2014). ASD affects about 1% of the world's population (Steinhausen et al., 2016) and has a prevalence in Chile of 1 in 51 children, with a gender distribution of four boys for every girl (Yáñez et al., 2021). In general terms, as stated by the American Psychiatric Association (2014), individuals with ASD may experience difficulties in initiating or maintaining social interactions and in using verbal or nonverbal language and often exhibit inflexibility, repetitive behaviors, and hypo- or hyper-sensitivity to stimuli. The term spectrum alludes to the variability in which the disorder presents itself, as there is significant heterogeneity in the abilities and difficulties raised by individuals with ASD (Fletcher-Watson & Happé, 2019; Lieb & Bohnert, 2017).

Research reveals that students with ASD experience more difficulties than typically developing students (TD). They tend to achieve poorer learning outcomes (Bullen et al., 2020; Gilmour et al., 2019; Keen et al., 2016; Mayes et al., 2020), experiencing more school absenteeism (Adams, 2021; Adams et al., 2022; Black & Zablotsky, 2018; Mattson et al., 2022; Munkhaugen et al., 2017; Ochi et al., 2020; Totsika et al., 2020), more bullying Adams et al., 2014; Ashburner et al., 2019; Hwang et al., 2018; Rowley et al., 2012; Sreckovic et al., 2014), more social isolation (Bauminger et al., 2003; Bauminger & Kasari, 2000; Humphrey & Symes, 2011), more behavioral problems (Boonen et al., 2014; Hastings et al., 2020; Konst et al., 2013; Kurzius-Spencer et al., 2018; Matson et al., 2010) and more emotional problems (Green et al., 2000; Kuusikko et al., 2008; Shtayermman, 2009). Because of these difficulties, it is important to study which variables can positively influence the educational experience of ASD students.

In this sense, the teacher-student relationship (hereafter TSR) is an essential protective factor for successful student trajectories. It is a predictor of school performance (Lee, 2012; Ma et al., 2017; Mensah & Koomson, 2020), student engagement (Lee, 2012; Pérez-Salas et al., 2021; Pianta et al., 2012; Roorda et al., 2011) and motivation (Hussain et al., 2019; Koca, 2016) of TD students. At the same time, a TSR characterized by conflict is a significant risk factor for developing affective problems in students (Olivier et al., 2020). Despite the above evidence, few studies have addressed TSR in ASD students, and there is little evidence that describes what TSR is like in ASD students and what factors influence it.

The few existing studies that have addressed TSR in ASD students have revealed that this relationship is characterized by less closeness and more conflict compared to the relationship between teachers and students with TD (Blacher et al., 2014; Caplan et al., 2016; Feldman et al., 2019; Losh et al., 2022; Prino et al., 2016; Roorda et al., 2021). The more challenging relationship between teachers and students with Autism Spectrum Disorder (ASD) may stem from the students' difficulties in social interactions, such as understanding social cues, maintaining conversations (Davis & Crompton, 2021), and interpreting emotional expressions (Ghanouni & Jarus, 2021). These issues can hinder effective communication and rapport in the classroom (Bellini, 2006). Additionally, teachers often lack specific training in ASD, leading to difficulties in adequately supporting and understanding these students' unique needs (Moreno & O'Neal, 2008).

The only evidence contradicting these results is the research of Losh et al. (2022), conducted in the United States. This study investigated the perspectives of 136 children with ASD aged 5 to 9 years regarding their relationships with their teachers and their consistency with the perceptions reported by the teachers. The results indicated that students with ASD report positive experiences regarding their relationship with their teachers. Expressly, 80.7% of the students stated that they liked their teacher, and 75.0% reported feeling that their teacher appreciated them. However, as pointed out by the authors themselves, these results should be interpreted with caution since there was no control group to determine whether these results differed from those of students with TD.

Along the same lines, Pérez-Salas et al. (2021), in a study conducted in Chile with students with special educational needs (SEN) other than ASD, found that students with SEN reported better TSRs than their peers with TD. These results also differ from extensive literature that reveals that the TSR is worse in the case of students with SEN compared to their peers with TD (Freire et al., 2020; Murray & Greenberg, 2006) and were explained by Pérez-Salas et al. (2021) as a possible consequence of the particularity of the Chilean school system, specifically regarding the existing school integration program and the presence of special education teachers that could be positively influencing the TSR in Chilean schools, based on the individualized work that they do with students with SEN (Pérez-Salas et al., 2021).

These contradictory results (regarding whether students with ASD report a worse or better relationship

with their teachers compared to their peers with TD) could also be explained by the different reports used. Evidence that the relationship between teachers and students with ASD is characterized by less closeness and more conflict has been constructed from teacher reports, not from student reports (Blacher et al., 2014; Caplan et al., 2016; Feldman et al., 2019; Losh et al., 2022; Prino et al., 2016; Roorda et al., 2021). The only study that has found positive reports of TSR with ASD did so precisely from the report of students (Losh et al., 2022). This study by Losh et al. (2022) also sought to contrast the reports of students with ASD and teachers regarding the TSR, finding a low correlation between both reports. This finding is consistent with other research that has compared reports of teachers and students with TD (Hughes, 2011; Murray et al., 2008), and it has been shown that these reports have different predictive values. While both reports are predictive for student engagement (Hughes et al., 2012) and perceived academic competence (Hughes, 2011), only student report has also been found to be predictive for variables such as sense of belonging to the school (Hughes, 2011) and mathematics achievement (Hughes, 2011; Hughes et al., 2012). Considering this background, it is necessary to study the relationship between teachers and students with ASD from the student's perspective.

On the other hand, research that has studied the TSR in students with ASD has focused on preschool education (Losh et al., 2022) and elementary education (Blacher et al., 2014; Caplan et al., 2016; Feldman et al., 2019; Losh et al., 2022; Prino et al., 2016). There are no studies that address the TSR with ASD in secondary education. The relevance of studying the TSR with ASD at this school stage lies in the particular characteristics of this stage that could affect the TSR. On the one hand, secondary education usually happens in a different environment: schools become larger or include new classes, norms, rhythms, and demands (Bakadorova & Raufelder, 2018), and the number of teachers increases, causing students to spend less time with each teacher (Roorda et al., 2017). Furthermore, during secondary education, students go through adolescence, characterized as a period of sensitive development in which cognitive, affective, sexual, and social changes occur, which have an impact on the relationships that the adolescent has with their environment (Steinberg, 2005).

Studies that have addressed the TSR in adolescent students with TD indicate that teacher involvement decreases during secondary education (Maulana et al., 2013). This may be predominantly negative for students with ASD, given the educational difficulties they present and the importance of the teacher-teacher relationship in supporting those difficulties. A positive TSR is related to the satisfaction of basic psychological needs for autonomy, relatedness, and competence throughout adolescence (Bakadorova & Raufelder, 2018) and increased student motivation (Maulana et al., 2013), both of which are essential aspects of student's engagement and their well-being (Engels et al., 2021; Roorda et al., 2017).

Finally, the research that has focused on the TSR in TD students has also examined gender differences, indicating that females seem to experience a more positive TSR, characterized by greater closeness, compared to their male peers, who experience more significant conflict (Hajovsky et al., 2017; Silver et al., 2005; Spilt et al., 2012). However, despite this evidence, none of the research that has addressed TSR in students with ASD has analyzed gender differences, constituting a significant limitation of the current literature. The existing studies, following the gender distribution of the disorder, have samples with a more excellent representation of men (close to 80%), and they lack statistical analyses that address potential gender differences. In this sense, given that the samples of students with ASD are composed of more men, we could be dealing with an effect associated with the gender of the student than with the presence of ASD, or there could be differentiated results (interaction) by gender and student condition (ASD vs. TD). It is necessary to clarify the role of the student's gender in these relationships, which could help identify subgroups with particular intervention needs.

From the above background, the research question arises: How do the TSR experiences of male and female students with ASD compare to those of typically developing students, based on their reports? Knowing what the TSR is like in adolescent male and female students with ASD will not only contribute to filling an important gap in the existing literature. Still, it may also contribute to supporting future interventions that seek to promote the TSR of adolescent students with ASD and, consequently, to encourage their bonds, their school experience, and their academic results.

METHOD

The present study followed a non-experimental, cross-sectional, comparative, and quantitative design. The non-manipulation of the variables justifies the associative strategy used, and the main objective is the comparison between two groups (ASD and TD) (Ato et al., 2013).

Table 1. **Sociodemographic characteristics of the sample**

	Gender (n, %)		Age (M, SD)	Socioeconomic Status (n, %)		
	Female	Male		Low	Medium	High
ASD	15 (46.87%)	17 (53.12%)	15.13 (.17)	11 (34.37%)	17 (53.12%)	2 (6.25%)
TD	18 (56.25%)	14 (43.75)	14.63 (.11)	12 (37.5%)	17 (53.12%)	2 (6.25%)
Total	33 (51.56%)	31 (48.43%)	14.85 (.14)	23 (35.93%)	34 (53.12%)	4 (6.25%)

Participants

Sixty-four students enrolled in their first year of secondary school in municipal educational schools in the Biobío region participated in the study (M_{age} = 14.85 , SD = .14). Of these participants, 32 of them were students diagnosed with ASD ($M_{ASD\ age}$ = 15.13, SD = .17), and 32 were TD peers ($M_{TD\ age}$ = 14.63 , SD = .11). Thirty-three were female (51.56%), and 31 were male (48.43%). These and other sociodemographic characteristics of the sample are detailed in table 1.

The equivalence of the ASD and TD groups was verified. No differences were found regarding gender ($x^2_{(1)}$ = .56, p = .45), age ($t_{(57)}$ = 1.94, p = .057), or socioeconomic status ($x^2_{(5)}$ = .31, p = .99), and, therefore, both groups were considered equivalent.

Variables and Instruments

Sociodemographic variables: Regarding the sociodemographic variables, the students' gender, and socioeconomic status were considered. According to the objectives of the study, two conditions were established: Students with autism spectrum disorder (ASD) and students with typical development (TD). Each state is detailed below.

- The student with Autism Spectrum Disorder (ASD): Operationally, the presence of ASD was ascertained through the diagnosis provided by the school integration program (PIE) of each establishment, which, according to governmental guidelines, must have the student's diagnosis to generate school intervention plans provided by suitable professionals.
- Student with Typical Development (TD): A Student who does not have any special educational needs and, therefore, can access the curriculum without requiring specialized support (López & Valenzuela, 2015). Operationally, TD was ascertained through the students not belonging to the school integration program of the school.

Teacher-Student Relationship (TSR): This was operationalized through the score obtained in the TSR subscale of the Student Engagement Inventory (SEI) instrument. The SEI (Appleton et al., 2006) is a scale made up of 35 Likert-type items, with values from 1 to 4 (1: Strongly disagree to 4: Strongly agree), and six factors that correspond to factors that influence student engagement (Veiga et al., 2014). This instrument contains a TSR subscale of 9 items (e.g., "My teachers are there for me when I need them."). In its original development and validation, Appleton et al. (2006) reported an internal consistency with an overall Cronbach's alpha of α = .88. This instrument has recently been validated in a sample of Chilean students from the province of Concepción with and without SEN (González et al., 2022). In that sample, an acceptable internal consistency was reported, with alphas and omegas between ω = .76 y ω = .88 in each of the subscales, and it showed a good fit for the 6-factor structure validated in the study by Appleton et al. (2006). Reliability for the present sample was α = .84 for the TSR subscale.

Procedure

The present study is nested in a larger research project to study the student engagement trajectories of students with and without SEN. Data from the first wave of the study (data collected between September and November 2018) was used, specifically a subsample of 32 excluded cases (students with ASD) and a random subsample of 32 cases of TD students (out of 678) to allow comparison between both groups.

The project contemplated, as a first step, ethical clearance. The study received approval from the Universidad de Concepción, Chile's committee responsible for ethics, bioethics, and biosecurity, under the approval number CEBB 1092-2022. After that, the different departments of municipal education administration and the respective schools were contacted, and authorization was obtained. Then, each student sent an informed consent form to the caregivers to authorize their participation in the study (a paper document that also included a request for socio-

Table 2. **Descriptive statistics of TSR Subscale by student's condition and student's gender**

	ASD		TD		ASD Female		ASD Male		TD Female		TD Male	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
TSR	3.01	.58	2.96	.53	2.75	.55	3.24	.53	3.04	.43	2.86	.64

Table 3. **Intersubject factorial analysis of variance of teacher-student relationship according to student's status and student's gender**

	ANOVA			
	F	df	p	η_p^2
Teacher-student relationship				
Student condition	.11	1, 60	.73	.002
Student gender	1.31	1, 60	.25	.02
Student condition x student gender	5.96	1, 60	.01	.09

demographic data). With the delivery of the caregiver's authorization (informed consent signed by the caregiver), the students were invited to participate, and they had to sign an informed consent form for their participation and subsequently complete a self-report questionnaire. All students were offered an incentive to encourage participation, which consisted of a movie ticket (valued at approximately 3 USD).

Data Analysis

SPSS version 25 statistical software was used to perform all the analyses. As a first step in the data analysis, the database was created. For this purpose, the cases of ASD and a random sample of students with TD were extracted. After that, missing data were analyzed, and it was found that <1% of the data were missing. No data imputation method was used. We analyzed the psychometric properties, specifically Cronbach's alpha for the TSR subscale, in the current sample.

After that, descriptive analyses of the sociodemographic variables of the sample and for each group were performed, reviewing the measures of central tendency and dispersion. The normality of the TSR variable was checked using the Kolmogorov-Smirnov test (p = .09). Chi-square and t-student tests were used to verify that both groups were equivalent, demonstrating that there were no statistically significant differences between the groups regarding gender, age, and socioeconomic status (p > .05). Finally, factorial ANOVA was performed to analyze the relationship between the variables of interest: student status, gender and TSR. The level of statistical significance was set at p = .05, and pairwise comparisons were performed using Bonferroni.

RESULTS

The TSR subscale obtained a mean of M_{TSR} = 2.98 (SD = .06), which within the Likert scale of the instrument would correspond to three: agree, which denotes a positive TSR in general terms. The minimum score obtained was 1.78, and the maximum was 4 (maximum of the scale) (see table 2).

Regarding data dispersion, the TSR shows a greater dispersion in the case of students with ASD, reaching higher and lower scores than their peers with TD. Also, when observing the dispersion of the data concerning the gender of the student, it is observed that there is a similar phenomenon where the TSR dimensions show a greater dispersion in the case of women than in the case of men.

The results of the between-subjects factorial ANOVA reveal that there is a significant interaction between student condition (ASD vs TD) and gender ($F_{(1,60)}$ = 5.96, p= .01, η_p^2 = .09), with 9% of the differences between subgroups explained by this interaction. In practical terms, this interaction translates into an average difference of 2.43 points on the 36-point total scale of our 9-item Likert-scale instrument.

Post-hoc comparisons indicated that there are statistically significant differences in the TSR between men with ASD and women with ASD, where men with ASD report a better TSR than women with ASD ($t_{(31)}$ = 2.53, p = .01), no such difference was found between men with TD and

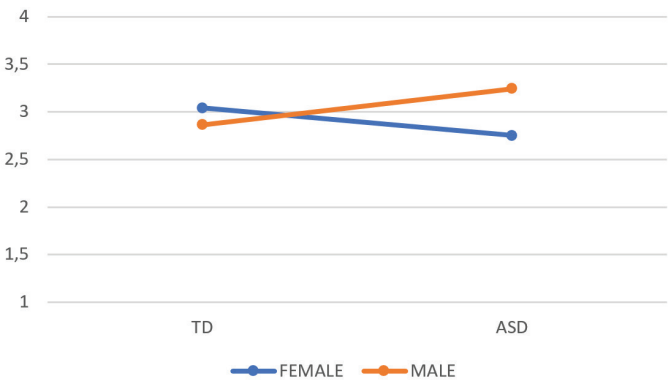

Fig. 1. Interaction of Student Condition and Gender in the TSR

women with TD. Nor were statistically significant differences found between men with TD and men with ASD or between women with TD and women with ASD ($p > .05$) (see fig. 1).

Regarding main effects, no statistically significant differences were found in the TSR between males and females ($F_{(1,60)} = 1.31$, $p = .25$, $\eta_p^2 = .02$), nor between students with ASD and TD ($F_{(1,60)} = .11$, $p = .73$, $\eta_p^2 = .002$).

DISCUSSION

The present study sought to compare the TSR in adolescent male and female students with ASD with that of their peers with TD. This study's results indicate a significant interaction effect between the student's gender and his/her condition (ASD or TD). Female students with ASD were found to report a worse TSR than their male peers with ASD. These results differ from the literature that has studied gender differences in the TSR, which indicates that these relationships would be closer and with less conflict in the case of women (Hajovsky et al., 2017; Silver et al., 2005; Spilt et al., 2012). A possible explanation for this phenomenon may be related to phenomena such as masking, which causes female students with ASD to mask their difficulties to a greater extent (Cook et al., 2017; Corscadden & Casserly, 2021; Hull et al., 2020; Tierney et al., 2016) and, therefore, receive less support, concentrating the available help on those who appear to require more help, thus strengthening the TSR in male students with ASD.

Another important finding of the present study is that there are no statistically significant differences in the TSR in students with ASD and TD. This is inconsistent with research in the area that indicates that the TSR in students with ASD is characterized by less closeness and more conflict compared to the TSR in students with TD (Blacher et al., 2014; Caplan et al., 2016; Feldman et al., 2019; Losh et al., 2022; Prino et al., 2016; Roorda et al., 2021). Possible explanations for this phenomenon are related to the effects that the school integration program (PIE) may have on the TSR. The PIE, through the personalized support of special education teachers, offers individualized treatment to students who require support, providing flexible pedagogical strategies that adapt to the needs of students to offer the highest level of participation and learning possible (Ministerio de Educación, 2016). These personalized pedagogical practices, tailored to the student's needs and characterized by greater closeness, could favorably impact the perception that students with ASD have of their relationship with their teachers.

Another possible explanation for the inconsistency of this finding with previous research relates to the type of reporting used. Previous research that has found worse TSRs in students with ASD has been based on teacher rather than student reporting (Blacher et al., 2014; Caplan et al., 2016; Feldman et al., 2019; Losh et al., 2022; Prino et al., 2016; Roorda et al., 2021). Furthermore, as mentioned by Losh et al. (2022), there is a low correlation between the reports of students with ASD and their teachers. Thus, students with ASD may be evaluating the TSR more favorably compared to their teachers, which could be due to the difficulties that students with ASD may show in identifying complex emotions in others (Castelli, 2016). In this sense, students with ASD may not be recognizing the feelings associated with concern, difficulty, or rejection of their teachers. On the other hand, teachers, being more aware of the negative emotions present, may rate relationships with their students with ASD less favorably.

It is recognized that many students with ASD may present challenges in identifying and responding to social and emotional cues. This characteristic may influence how they perceive and report relationships with teachers. Research such as that of Castelli (2016) suggests that these differences in perception may lead students with ASD to rate their relationships with teachers more positively, possibly due to a lower sensitivity to recognizing complex emotions in others, such as concern or rejection. However, the students' perspective provides unique and valuable insight into interactions in the educational environment, regardless of whether they are viewed as "correct" from the outside. It offers an alternative interpretation that may predict several educational variables and represents an intrinsically valuable perspective (Hughes, 2011; Murray et al., 2008). Thus, our findings highlight the importance of considering student and teacher per-

spectives when assessing the teacher-student relationship in ASD populations.

Furthermore, this research contributed to an essential gap in the literature and allowed the study, for the first time, of the TSR in adolescent students with ASD from their perspective, also performing specific analyses to verify the existence of differences in relation to the student's gender. However, despite the strengths of this study, these findings should be interpreted in the context of the limitations of this research. Among the most critical limitations of the study is the small sample size, which affected the power needed to verify the existing differences in the TSR between conditions specifically. In addition, there were no other control measures, such as the severity level of ASD, the presence of intellectual disability, and other contextual variables that could allow further conclusions and explanations of the phenomenon.

Although the differences identified in our study are minor, they are significant, setting a precedent for future research with more extensive and diverse samples. The modest effect size highlights the need for further investigation into the nuances of these differences, especially regarding gender, in autistic populations compared to typically developing students. This research is vital for understanding the interplay between gender and autism and developing more effective support strategies.

Considering these limitations, future research should replicate and deepen the associations addressed in this study and, at the same time, consider possible predictors of the TSR. In this area, research that has studied the TSR in students with ASD addresses elements that are difficult to intervene on since evidence indicates that the symptomatology of ASD is stable over time (Bieleninik et al., 2017; Steinhausen et al., 2016). On the other hand, this approach makes only the student responsible for the quality of the TSR, leaving aside what the teacher and the educational establishment can do to impact it. Thus, it is necessary to investigate factors beyond the symptomatology related to ASD and examine contextual factors that open possibilities for intervention and improvement of the TSR.

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