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Being the mother of an autistic child: A comprehensive study of mother–child relationships

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ABSTRACT

Aims: This study examines mother–child relationships and parenting stress in the context of autism using self-report and observed measures. It compares dyads of mothers with autistic and mothers with non-autistic children in terms of perceived conflict and closeness, parenting stress, and observed mother–child interaction quality. It also examines the role of autism characteristics and the moderating role of parenting stress within these groups on mother–child relationships. **Method:** The sample included 66 autistic and 55 non-autistic preschoolers and their mothers. Questionnaires were administered online and through structured phone interviews to assess autism characteristics, and interactions were video-recorded via Zoom. **Results:** Dyads including autistic children exhibited higher levels of perceived conflict and lower perceived closeness and observed interaction quality compared to dyads with non-autistic children. Mothers with autistic children reported significantly higher levels of parenting stress across all three subscales of the Parental Stress Index (parental distress, dysfunctional interaction, and difficult child) compared to mothers with non-autistic children. Parenting stress moderated the group difference in perceived closeness: parents with low stress and an autistic child reported less closeness than those with a non-autistic child, whereas at high stress levels this difference was not observed. Parenting stress was positively associated with perceived conflict regardless of group. Additionally, autism characteristics were negatively associated with perceived closeness and positively associated with dysfunctional interactions. **Conclusion:** This study suggests that perceived relationships and observed interaction quality vary between dyads with and without an autistic child. In addition, autism characteristics and parenting stress play roles in understanding mother–child relationships.

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Parenting stress in the autism context

Autism is no longer considered a rare condition, with a prevalence of approximately 2 % in both Canada and the United States (Maenner, 2021; Public Health Agency of Canada, 2021). Accordingly, experiences of parenting an autistic child are not infrequent. Although some parents cope remarkably well with the challenges of raising an autistic child (Hoffman et al., 2009; Rutgers et al., 2007), many feel overwhelmed with the prolonged diagnostic procedures and the burden of caregiving responsibilities, and they may also experience feelings of isolation and anxiety about their children's futures (Corcoran et al., 2015; Périard-Larivée et al., 2024). A large body of literature has demonstrated that these parents exhibit heightened parenting stress levels (Barroso et al., 2018; Lievore et al., 2024; Tsermentseli & Kouklari, 2021) as well as depressive and anxiety symptoms (Shepherd et al., 2021), often to a greater degree than parents of children with other developmental problems such as intellectual disability (Al-Farsi et al., 2016; Estes et al., 2009; Hastings & Brown, 2002).

Experiencing high levels of stress is a significant predictor of reduced parental sensitivity (Ward & Lee, 2020), a key variable in the development of secure attachment in parent–child relationships (De Wolff & van Ijzendoorn, 1997). However, few studies have focused on parent–child relationships in the context of autism while also considering the role of parental stress, although some have examined the role of parental stress in child or parenting outcomes (Reed & Osborne, 2013). For example, Giovagnoli et al. (2015), specifically focusing on dysfunctional interactions, found that parenting stress was negatively associated with social skills, including daily living and interpersonal relationships, in autistic children. Osborne (2009) proposed a dynamic transaction model in which parenting stress may be dynamically associated with communication skills, but this model has not been tested while specifically focusing on mother–child relationships (Reed & Osborne, 2013). Therefore, the current study aims to provide a more comprehensive understanding of mother–child relationships, taking into account factors such as autism characteristics and parenting stress in the context of autism. In this study, we conceptualize the mother–child relationship as a multidimensional construct and assess it based on both observed interaction quality and mothers' self-reported perceptions of their relationships with their children.

Maternal sensitivity and mother–child relationships

Quality of care is a multidimensional concept that includes the physical and emotional availability of the caregiver, the attention given to the child, the sensitivity to the child's needs, and the responses given to the child's signals (Gunnar & Donzella, 2002). Sensitive parents act predictably, consistently, and warmly toward their children's signals and needs, influencing the quality of mother–child interactions (Kivijärvi et al., 2001). They perceive the child's signals well and respond appropriately; interactions follow the child's pace and are characterized by a certain degree of reciprocity (Ainsworth et al., 1978; Shin et al., 2008). Parent–child relationships are bidirectional (Harach & Kuczynski, 2005; Loulis & Kuczynski, 1997), meaning that both the mother and the child are likely to influence each other's behaviors, emotions, and responses, thereby mutually influencing the quality of their relationship. Several aspects of interaction define the quality of the relationship, including responsiveness, age appropriateness, and warmth during the interaction (Biringen et al., 2000). These components have been extensively studied in non-autistic samples, with maternal sensitivity recognized as a particularly critical parental behavior associated with high-quality mother–child interaction (Ainsworth et al., 1978; Shin et al., 2008). Maternal sensitivity is typically measured through observations of structured and unstructured mother–child interactions, such as in caregiving contexts or free play (Behrens et al., 2012; Biringen et al., 2000). Maternal behaviors such as non-intrusiveness, age-appropriate verbal and nonverbal communication, showing interest in the child while also allowing space for autonomy, and responding appropriately to the child's signals have been coded as sensitivity (Cerezo et al., 2021). In this sense, the quality of interaction is often described in terms of maternal sensitivity while examining the association of maternal sensitivity and child outcomes. For example, non-intrusive play as a dimension of sensitivity has been linked to healthier developmental outcomes, including secure attachment (Pons-Salvador et al., 2025). Similarly, maternal availability and positivity during interactions, also considered markers of sensitivity, have been associated with children's socioemotional development (Bernier et al., 2021).

Mother–child relationships in the context of autism

Given the communication and social interaction challenges associated with autism, it can be difficult for parents of autistic children to accurately interpret and respond sensitively to their children's needs, as their expressive abilities may be limited and their needs may differ from what parents would typically expect. The communication difficulties of autistic children may lead to negative parental feelings and a sense of low parental competence, which could subsequently contribute to high levels of parental anxiety and depression (Hastings & Brown, 2002). This psychological distress, combined with the children's ongoing relational difficulties, may impair parents' emotional availability and sensitive responses (Dolev et al., 2009) and their perceived relationships with their children. Specifically, parents of autistic children reported lower positive relationship scores than parents of non-autistic children (Riany et al., 2017) and higher levels of conflict than mothers of children with other developmental disabilities (Teague et al., 2018). Moreover, parents of children with autism have been observed to be more directive compared to parents of non-autistic children (McCauley & Solomon, 2022) and more controlling than parents of children with other developmental disorders (Lemanek et al., 1993). In contrast, other authors found no differences in maternal sensitivity (either observed or self-reported) or support between autistic and non-autistic dyads (Baker et al., 2010; McCauley & Solomon, 2022; van Ijzendoorn et al., 2007), although they reported more complex associations with child development. In the study conducted by van Ijzendoorn et al. (2007), although maternal sensitivity did not differ between the groups, sensitivity was associated with attachment security only in the non-autistic group, while autistic children

showed more attachment disorganization. In the study by Baker et al. (2010), maternal sensitivity was positively associated with behavioral problems, but at the same time, it predicted better language outcomes in emergent autistic children, whereas in non-autistic children maternal sensitivity was negatively associated with behavioral problems. These findings raise questions about the association between maternal sensitivity and child development in autistic children and other related variables, such as the level of autism characteristics, given that higher levels of autism characteristics in the social domain were found to be negatively associated with attachment security (van IJzendoorn et al., 2007). Since parent–child interaction is bidirectional (Loulis & Kuczynski, 1997), the levels of the child’s autism characteristics may influence the quality of these interactions in the context of autism. For example, some authors have suggested that maternal sensitivity, measured as the quality of observed mother–child interactions, may diminish as the levels of autism characteristics rise (Beurkens et al., 2013; Hobson et al., 2016). In contrast, no such correlations were found when parent–child interaction quality was self-reported by mothers (Beurkens et al., 2013). Overall, these findings not only highlight the need to consider the levels of autism characteristics in attempts to understand mother–child relationships with autistic children; they also underscore the importance of considering multiple perspectives when measuring the quality of parent–child interactions with autistic children.

Methodological considerations

It is essential to utilize strong methodological approaches in the complex domain of studying sensitivity and mother–child relationships. A variety of methods can be used to study parenting quality, such as parental reports or observational measures applied by independent coders. Each method has its own unique contributions and considerations. For example, self-reports of parenting can provide valuable information about parents’ beliefs and practices regarding child rearing (Durgel et al., 2013). Although self-reporting can be influenced by social desirability and individual factors such as stress (Hickey et al., 2020; Morsbach & Prinz, 2006), it remains a preferred method for obtaining parental perceptions of life experiences with the child. In contrast, observational methods, particularly those that assess mother–child interactions, provide insights into parental behaviors that would not otherwise be revealed by parents (Wan et al., 2019). In addition, observations conducted in the home are likely to be more ecologically valid than those conducted outside the home, as they reflect parent–child interactions in their natural environment (Hart & Risley, 1992).

The limited literature on maternal sensitivity and parent–child interaction quality in general in the context of autism varies widely in its methods and constructs. Some studies have focused on emotional availability using an observational scale, assessing parent–child interaction with the Emotional Availability Scales (EAS; Biringen et al., 2014; Benteuto et al., 2020; Dolev et al., 2009). Others have used the Maternal Behavior Q-set (Pederson et al., 1990) to measure maternal sensitivity and capture mothers’ behaviors toward their children (Kim & Kim, 2009) or the Dyadic Coding Scales (Humber & Moss, 2005), which reflect the contribution of both members of the dyad (Beurkens et al., 2013; Hobson et al., 2016). Some studies have conceptualized maternal behavior using only a parenting stress index (Hoffman et al., 2009). Other studies included children not yet diagnosed, such as high-probability samples including children with autistic siblings (Wan et al., 2019). Some researchers compared emergent autistic children with a mixed group that included non-diagnosed children with autistic siblings (Baker et al., 2010). Others compared autism with intellectual disability or developmental delay without autism (Valicenti-McDermott et al., 2015). Some studies did not have any comparison groups (Benteuto et al., 2020; Beurkens et al., 2013; Dolev et al., 2009; Hobson et al., 2016). In this empirical context, it is difficult to understand the nature and characteristics of mother–child relationships in dyads that include an autistic child. Therefore, to strengthen the method applied in this study, we examined both perceived and observed mother–child relationships for a group of autistic children and a group of non-autistic children.

Aims and hypothesis

This study aimed to shed light on mother–child relationships in dyads with an autistic child using the two assessment methods of self-report and observational measures, comparing these dyads with mother–child dyads without an autistic child. It was expected that parents in the autistic group would report higher conflict and lower closeness compared to parents in the non-autistic group. Furthermore, dyads in the autistic group were expected to have lower observed mother–child interaction quality than dyads with a non-autistic child. Parental stress was also examined between the groups and it was hypothesized that parents in the autistic group would have higher scores for the parental distress, parent–child dysfunctional interaction, and difficult child subscales of the Parental Stress Index (PSI) (Abidin, 1995) than parents in the non-autistic group. In addition, high levels of parental stress in the autistic group (Hayes & Watson, 2013) could contribute to possible observed differences in mother–child relationships between the groups of dyads with and without an autistic child. Therefore, for exploratory purposes, we examined the moderating role of parental stress levels between the groups on mother–child relationships.

Furthermore, this study also examined the association between autism characteristics and the mother–child relationship and maternal stress levels in the autistic group. It was expected that autism characteristics would be negatively associated with perceived closeness and observed mother–child interaction quality but positively associated with perceived conflict and parenting stress.

Method

Participants

A total of 121 mother–child dyads were recruited in Québec, including 66 dyads (males = 50, females = 16) in which the child was autistic and 55 dyads (males = 27, females = 28) in which the child was not autistic. The autistic group had a higher proportion of male

children (75.8 %) compared to the non-autistic group (49.1 %), constituting a significant sex difference between the groups, $\chi^2(1, N = 121) = 9.22, p < .01$. The children in the autistic group were also significantly older than the children in the non-autistic group. [Table 1](#) presents descriptive and group differences for sociodemographic variables.

The education levels of the mothers were measured on a 6-point Likert-type scale (1 = primary school degree, 2 = secondary/high school degree, 3 = two-year college degree, 4 = bachelor's degree, 5 = master's degree, 6 = doctorate degree). Annual family income was measured with a 4-point Likert-type scale (1 = 40,000 CAD and below, 2 = 41,000–80,000 CAD, 3 = 81,000–120,000 CAD, 4 = 121,000 CAD and above). There was a significant group difference regarding family income, with the non-autistic group having significantly higher income levels (see [Table 1](#)). Diagnostic information was also collected for the mothers. A chi-square test was conducted to examine the group difference in maternal diagnoses (none, one, or comorbid). The association was statistically significant, $\chi^2(2, N = 101) = 22.49, p < .001$. In the non-autistic group, most mothers had no diagnosis (65.5 %), with only 18.2 % having one diagnosis and 1.8 % reporting comorbidity (14.5 % of mothers did not answer this question). In contrast, in the autistic group, only 25.8 % of mothers had no diagnosis, while 36.5 % had one diagnosis and 19.7 % had comorbid conditions (18.2 % of mothers did not answer this question). Among those who answered this question, 12 mothers in the autistic group reported an autism diagnosis, 27 reported anxiety problems, 9 reported attention deficit hyperactivity disorder (ADHD), and 7 reported depression. In the non-autistic group, no mothers reported an autism diagnosis (exclusion criterion), while 7 reported anxiety problems and 2 reported ADHD. Please see [Supplementary Table 1](#) for more details related to these diagnostic categories. The data collection was conducted over approximately three years (2020–2023), coinciding with the COVID-19 pandemic. Consequently, a control variable called “data collection time” was computed to regulate for the duration of data collection. This variable ranged from 1 to 4, indicating specific time frames, with higher scores indicating later stages of the pandemic period. Given that it took more time to recruit autistic mother–child dyads, the data collection duration was higher in this group (see [Table 1](#)).

Because the data were collected online, diagnostic information was obtained from the mothers by phone during the initial contact, and additional details were later gathered through an online questionnaire. Children with a diagnosis or in the diagnostic process, with the condition of having an autistic sibling or mother in the latter case, were included in the autistic group, while the non-autistic group included children without autism or diagnosed developmental delay. Although the diagnostic information was parent-reported, data obtained with the Childhood Autism Rating Scale, Standard Version, Second Edition (CARS2-ST) ([Schopler et al., 2010](#)) and the Short Sensory Profile Scale ([McIntosh et al., 1999](#)) in a larger project involving the same participants confirmed that these two groups differed in terms of autism characteristics.

Measures

Perceived mother–child relationship

The French version of the Child–Parent Relationship Scale (CPRS) ([Pianta, 1992](#)) was used to capture the mother's view of her mother–child relationship. It was translated into French as part of a larger project following the translation-back translation technique. The CPRS consists of 15 items completed by the mothers of 3- to 12-year-old children using a 5-point Likert-type scale, with responses ranging from 1 (“definitely does not apply”) to 5 (“definitely applies”). The CPRS includes two subscales: (1) the conflicts subscale, consisting of 8 items assessing the degree to which the parent perceives the relationship with the child negatively, and (2) the closeness subscale, composed of 7 items assessing the parent's perceptions of warmth, affection, and open communication in the relationship with the child. Cronbach's alpha ranged between .69 and .78 for the subscales and .78 and .75 for the total scale for the groups in our sample. Higher scores indicate a greater number of conflicts and a higher level of closeness in relationships.

Observed relationships

The Parent–Child Interaction Grid ([Moss et al., 1996](#)) was used to code the quality of mother–child interactions. This coding includes eight subscales (coordination, communication, role, emotional expression, sensitivity/adapted response, tension/relaxation,

Table 1
Group differences in demographic variables.

	Non-autistic group <i>M (SD)</i> Min.-Max.	Autistic group <i>M (SD)</i> Min.-Max.	One-way ANOVA statistics
Child's age	4.06 (1.16) 2.03–5.80	4.59 (1.24) 1.57–7.59	$F(1, 119) = 5.98, \eta^2 = .05^*$
Mother's age	34.12 (4.28) 25.72–44.43	35.55 (5.02) 26.44–46.88	$F(1, 110) = 2.64, \eta^2 = .02$
Mother's education level	4.18 (1.03) 2–6	4.11 (1.25) 1–6	$F(1, 103) = .12, \eta^2 = .001$
Family's annual income	2.79 (.84) 1–4	2.41 (1.04) 1–4	$F(1, 107) = 4.41, \eta^2 = .04^*$
Data collection time	1.42 (.50) 1–2	1.89 (.90) 1–4	$F(1, 119) = 12.31, \eta^2 = .09^{**}$

*: $p < .05$, **: $p < .001$

mood, and pleasure) and an overall global score based on clinical judgment. Each item is rated on a Likert-type scale from 1 to 7, ranging from problematic interaction to reciprocal and synchronized interaction in which parents show high sensitivity and shared affect. Interaction quality was coded during a ten-minute snack and play session recorded on Zoom. Procedures for assessing parent–child interaction online have been successfully used in previous studies with autistic (Cyr et al., 2023) and non-autistic (Waller et al., 2024) children. Since the data were not obtained in a laboratory environment, other siblings or adults were present during the task recording in some cases. Therefore, a control variable was created to control for that environmental condition, referred to as “interruption by others” (0 = no interruption, 1 = other children or adults present during the task). One psychology graduate student and one clinical psychologist, blinded to the group of the child (i.e., autistic or non-autistic), independently coded 20 % of the total sample. They were both trained by an expert of the instrument on a separate sample. Interrater reliability scores were excellent with an ICC of .92 for the global score based on the average of subscale ratings. The global score was used in the analysis of mother–child interaction quality.

Parental stress

The Parental Stress Index-Short-Form (PSI-SF) (Abidin, 1995; French translation: Lacharité et al., 1992) is a 36-item self-report measure of parenting stress. It includes three subscales (12 items each) rated on a 5-point Likert-type scale ranging from 1 (“agree”) to 5 (“totally disagree”). The three subscales of Parental Distress, Dysfunctional Parent–Child Interaction, and Difficult Child consist of 12 items each. Parents use the 5-point scale to indicate the degree to which they agree with each statement. The reliability of the scale was calculated separately for each group, and for subscales and total scores, Cronbach’s alpha ranged between .79 and .92. The total PSI score was obtained by summing these three subscales, indicating overall stress due to parenting, interaction, and child characteristics. Each subscale is scored between 12 and 60, with scores of 36–180 for the total PSI scale. High scores above the 85th percentile may indicate elevated parenting stress (Abidin, 1995). A raw score of 90 or above (90th percentile and above) is commonly used as a cutoff for clinical stress (Rivas et al., 2021; Tomanik et al., 2004), although exact raw thresholds may vary by normative sample. In the current Canadian sample, the raw score corresponding to the 85th percentile was 93.1 in the non-autistic group and 133.5 in the autistic group. A raw score of 90 or above was used as cutoff score for descriptive purposes, while the total raw score was used as a continuous variable in all analyses.

Autism characteristics

The CARS2-ST (Schopler et al., 2010) is a standardized instrument comprising a questionnaire for the parent and a clinical evaluation grid that makes it possible to document the presence, intensity, and duration of behaviors associated with autism in children two years of age and older. In this study, the 39-item parent-rated questionnaire (Childhood Autism Rating Scale-Second Edition Questionnaire for Parents or Caregivers [CARS-QCP]) (Schopler et al., 2010) and a semi-structured recorded phone interview were applied to gather the information needed to complete the CARS2-ST evaluation. During the interviews, mothers were questioned on 15 themes related to the child’s behaviors, such as relationships with others, emotional response, coping with change, verbal and nonverbal communication, and level and consistency of intellectual reaction. Behaviors were rated on a 7-point scale with a range of 1–4 according to their frequency, intensity, duration, and particular features. Higher scores indicate higher levels of autism characteristics. The suggested cutoff score is 25.5 (Chlebowski et al., 2010). In this sample, seven children in the autistic group fell below this score. These children were retained in the autistic group as their parents reported an official diagnosis for five of them and the remaining two were undergoing diagnostic processes, with one confirmed at follow-up. For the remaining case, although the diagnostic process was ongoing, the child’s score on the Short Sensory Profile (McIntosh et al., 1999) was above 120, which falls in the “definite difference” category, and so this case was also retained in the autistic group. The total score was calculated by summing the points for each item, and it was used as a continuous variable in this study. All recorded phone interviews were coded by three trained PhD students in clinical psychology. The coders received training prior to coding, and interrater reliability was calculated based on a subset of cases coded independently by the first two coders and by the first and third coders. The interrater reliability for the total CARS2-ST score between pairs of coders was excellent (ICC = .92 and .92).

Procedure

This study is part of a longitudinal project named “Maman S’adapte.” The analysis was based on the first time point. The ethical principles of the Declaration of Helsinki were followed and ethical approval was obtained from the Human Research Ethics Committee of Université du Québec à Trois-Rivières (CER-18–252–07.27). Written informed consent was obtained from all mothers. The participants were recruited through social media and organizations such as daycare centers in Québec province and the province’s Autisme Québec – Community Center, available to all families, using non-random sampling strategies such as purposive and convenience sampling. Data were collected online using Qualtrics questionnaires and Zoom observations.

Results

Data analysis strategy

The maximum expectation technique was used to address missing items on a given scale separately for each group (see Table 2 for

descriptive statistics). If more than half of the items of a subscale were missing, that score was noted as “missing.” The analysis was conducted with complete cases; therefore, there were slight variations in the sample size. Univariate outliers were examined independently for each group for the parenting scales (perceived conflict and closeness, observed mother–child interaction quality, total PSI, and subscales of parental distress, dysfunctional interaction, and difficult child), the CARS2-ST score, and the control variables. Based on z-scores, all scores fell within the range of ± 3.29 , except for one case in the non-autistic group where the dysfunctional interaction score was higher than the mean ($z\text{-score} = 4.56$). After checking for multivariate outliers, this score was still an outlier, and to deal with this, the score was replaced with the nearest score for which $z\text{-score} = 2.21$. After this modification, there were no univariate or multivariate outliers. Skewness was within the acceptable range of -1 to $+1$ for each group for each parenting score.

Correlations between study variables

Bivariate correlations were computed separately for each group of dyads. For the non-autistic group, it was found that perceived conflicts between mother and child were negatively correlated with perceived closeness and positively correlated with the total PSI parenting stress score and its subscales. Perceived closeness was negatively correlated with total PSI and the subscales of parenting stress and parent–child dysfunctional interaction. However, no correlation was observed between the perceived relationship scores (conflicts and closeness) and the observed mother–child interaction quality. The mother’s education level was positively correlated with family income and the observed quality of mother–child interactions. Conversely, education levels were negatively correlated with total PSI and the subscale of parent–child dysfunctional interaction. In addition, family income was negatively correlated with total PSI and the parent–child dysfunctional interaction and difficult child subscales, while it positively correlated with perceived closeness and observed interaction quality.

For the autistic group, perceived conflicts were positively correlated with total PSI score and the subscales, excluding parental distress. Perceived closeness was negatively correlated with the parent–child dysfunctional interaction - PSI subscale and CARS2-ST scores. However, there was no correlation between the self-reported relationship scores and observed interaction quality. Furthermore, the parent–child dysfunctional interaction subscale was positively correlated with CARS2-ST scores. Finally, education level was positively correlated with family income, while education level and family income were negatively correlated with CARS2-ST scores (see [Tables 3 and 4](#) for the coefficients).

Group differences in relationship variables and parenting stress

Levene’s test was conducted to assess the assumption of homogeneity of variance. The results were not significant for observed mother–child interaction quality or the difficult child subscale of the PSI. However, Levene’s test was significant for perceived conflict and closeness, $F(1, 111) = 6.60, p = .01$, and $F(1, 111) = 5.48, p = .02$, respectively. It was also significant for the total PSI score, $F(1, 116) = 5.74, p < .05$, the parenting stress subscale, $F(1, 117) = 15.01, p < .001$, and the dysfunctional interaction subscale, $F(1, 117) = 17.64, p < .001$, showing that variances were not equal between groups. Welch’s t -test was applied due to unequal variances between groups.

Because there were significant group differences in demographic variables (child’s age, child’s sex, family income, and data collection time), these variables were included as covariates in ANCOVA performed to compare the groups in terms of relationship scores and parenting stress. For the mother–child interaction score, the presence of others during the task was also included as a covariate. All relevant covariates were initially considered; however, nonsignificant covariates were excluded from the final reported models. The assumption of homogeneity of regression slopes was satisfied for all outcomes.

For perceived conflict, one-way ANOVA results obtained without any covariates showed that the group effect was significant, $F(1, 111) = 39.09, p < .001, \eta^2 = .26$. Welch’s test again confirmed a significant group difference, Welch’s $F(1, 107.89) = 40.54, p < .001$. For perceived closeness, ANCOVA results obtained after controlling for the child’s age showed that the overall model was significant, adjusted $R^2 = .30, F(2, 110) = 24.99, p < .001$. A significant group effect was found, $F(1, 110) = 48.92, p < .001$, partial $\eta^2 = .31$, indicating a large effect size, with mothers in the autistic group reporting lower scores (marginal mean = 26.49) than mothers in the non-autistic group (marginal mean = 31.74). The child’s age also significantly predicted closeness, $F(1, 110) = 5.96, p < .05$, partial $\eta^2 = .05$. These results indicate that mothers in the non-autistic group reported less conflict and more closeness in their relationships than

Table 2
Descriptive statistics of the predictors.

	Non-autistic Group					Autistic Group				
	<i>n</i>	<i>M</i>	<i>SD</i>	Min.	Max.	<i>n</i>	<i>M</i>	<i>SD</i>	Min.	Max.
Perceived conflict	53	16.32	4.77	9	31	60	23.05	6.43	10	36
Perceived closeness	53	31.54	3.08	24	35	60	26.67	4.63	16	35
Observed interaction quality	53	5.30	1.14	3	7	52	4.10	1.42	1	7
Total parental stress (PSI)	54	73.47	16.95	43.00	111.86	64	107.02	23.98	42.00	147.00
Parental distress (PSI)	54	27.26	7.17	14.00	46.00	65	37.29	10.82	13.00	57.00
Parent–child dysfunctional interaction (PSI)	54	18.49	4.63	12.00	31.00	65	28.67	8.20	15.00	47.00
Difficult child (PSI)	54	27.48	8.78	12.00	50	64	41.31	10.64	13.00	58.00
CARS2-ST						54	31.86	5.10	20.50	43

Table 3

Bivariate correlations between study variables: Non-autistic group.

Measures	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Child's sex	1												
2. Child's age	.19	1											
3. Mother's age	.13	.27*	1										
4. Mother's education level	.34*	.04	.04	1									
5. Family's annual income level	.20	-.07	-.03	.58**	1								
6. Data collection time	-.05	-.20	-.21	-.16	.08	1							
7. Perceived conflict	.05	-.02	.08	-.11	-.15	-.03	1						
8. Perceived closeness	-.03	.06	-.13	.24	.35*	.12	-.36**	1					
9. Observed interaction quality	.13	-.03	-.04	.36**	.30*	.17	-.06	.16	1				
10. Total Parental Stress Index (PSI)	-.02	.06	.01	-.32*	-.39**	-.16	.66**	-.49**	-.09	1			
11. Parental distress (PSI)	.02	.12	.08	-.22	-.25	-.12	.42**	-.43**	-.08	.81**	1		
12. Parent-child dysfunctional interaction (PSI)	-.10	.07	-.02	-.37*	-.40**	-.07	.51**	-.58**	-.14	.72**	.40**	1	
13. Difficult child (PSI)	.04	-.04	-.05	-.19	-.32*	-.16	.68**	-.27	.01	.86**	.53**	.46**	1

* $p < .05$, ** $p < .01$, *** $p < .001$ **Table 4**

Bivariate correlations between study variables: Autistic group.

Measures	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Child's sex	1.00													
2. Child's age	-.06	1.00												
3. Mother's age	.19	.17	1.00											
4. Mother's education level	.18	.16	.35*	1.00										
5. Family's annual income level	.07	.22	.22	.53**	1.00									
6. Data collection time	.07	-.33**	.07	-.11	-.09	1.00								
7. Perceived conflict	-.18	.18	.05	-.16	-.08	.22	1.00							
8. Perceived closeness	-.04	.32*	-.06	.19	.07	-.13	-.12	1.00						
9. Observed interaction quality	-.01	.02	-.01	-.20	.04	.20	.03	.02	1.00					
10. Total Parental Stress Index (PSI)	.01	.04	.12	-.01	-.08	.25	.56**	-.13	-.03	1.00				
11. Parental distress (PSI)	.02	-.01	.08	.17	-.07	.12	.16	-.04	-.13	.80**	1.00			
12. Parent-child dysfunctional interaction (PSI)	-.06	-.05	.04	-.24	-.09	.25*	.55**	-.31*	.01	.75**	.37**	1.00		
13. Difficult child (PSI)	.03	.14	.15	-.03	-.02	.21	.67**	-.02	.00	.86**	.50**	.55**	1.00	
14. Autism characteristics (CARS)	-.09	-.30*	-.29*	-.43**	-.31*	-.11	.11	-.37**	-.19	.15	.06	.32*	.09	1.00

* $p < .05$, ** $p < .01$, *** $p < .001$

mothers in the autistic group and that group status explained a substantial amount of the variance in these scores. Because the variance between the groups was unequal, Welch's t -test was repeated. The results indicated that the group difference was still the same, $t(103.40) = 6.65$, $p < .001$.

For observed mother-child interaction quality, ANCOVA results obtained after controlling for the influence of the presence of others during the task showed that the overall model was significant, adjusted $R^2 = .21$, $F(2, 102) = 14.54$, $p < .001$. A significant group effect was found, $F(1, 102) = 17.69$, $p < .001$, partial $\eta^2 = .15$, indicating a medium effect size, with the autistic group having lower scores (marginal mean = 4.17) than the non-autistic group (marginal mean = 5.23). Thus, the presence of another person during the task had a significant effect, $F(1, 102) = 5.01$, $p < .05$, partial $\eta^2 = .05$.

For descriptive purposes only, the proportion of mothers scoring at or above 90 for total PSI score was also examined. In the non-autistic group, 16.7 % of mothers (9 of 54, as one mother did not complete the PSI-SF) had a score of 90 or above, while in the autistic group, 81.3 % of mothers (52 of 64, as two mothers did not complete the PSI-SF) had clinically high stress levels. A chi-square test was conducted to examine the association between group membership (autistic vs. non-autistic) and whether mothers scored in the clinical range of parenting stress. The association was statistically significant, $\chi^2(1, N = 118) = 48.92$, $p < .001$, indicating that mothers in the autistic group were significantly more likely to report clinical levels of stress than those in the non-autistic group.

The main effect of group was significant across all three subscales of the PSI. For the parental distress subscale, the ANOVA result was significant, $F(1, 117) = 34.02$, $p < .001$, $\eta^2 = .23$, with a large effect size. Welch's test also indicated a significant group difference, $F(1, 111.83) = 36.58$, $p < .001$, although the variance was not equal. For the parent-child dysfunctional interaction subscale, the result was also significant, $F(1, 117) = 65.72$, $p < .001$, $\eta^2 = .36$, indicating a large effect size. Welch's test was still significant, $F(1, 104.09) = 72.36$, $p < .001$. For the difficult child subscale, $F(1, 116) = 57.93$, $p < .001$, $\eta^2 = .33$, a large effect size was again observed. Welch's test was still significant, $F(1, 115.95) = 59.85$, $p < .001$. Mothers in the autistic group reported higher distress on all subscales than mothers in the non-autistic group (see Table 2 for raw means).

The moderating role of parenting stress

The moderating role of total parenting stress as reflected by PSI scores was further examined between the groups. All moderation analyses were conducted using PROCESS v4.1 (Hayes, 2013; Hayes, 2022), with HC3 heteroscedasticity-consistent standard errors to account for unequal variances in the outcome and/or moderator variables. Since there were significant group differences in the variables of child's age, child's sex, family income, and data collection time, they were included in the models as covariates, in addition to the control variable of "interruption by others" during the observed mother-child interactions. Nonsignificant control variables were excluded from the reported models to increase power.

For the perceived conflict scale, the model (without any covariate) was significant $R^2 = .52$, $FHC3(3, 107) = 49.24$, $p < .001$. The interaction between group and total PSI score was not significant, but the total PSI score positively predicted perceived conflict ($B = .18$, $p < .001$). For the perceived closeness scale, the model with child's age as a covariate was significant, $R^2 = .37$, $FHC3(4, 106) = 20.26$, $p < .001$, with child's age being positively associated with perceived closeness ($B = .79$, $p < .05$). The interaction term was significant ($B = .07$, $p < .05$) with a small effect size ($\Delta R^2 = .019$). A simple slope calculation based on ± 1 SD from the mean showed that the slope was significant for low PSI scores ($b = -4.95$, $p = .001$), but not for high PSI ($b = -1.40$, $p = .24$). This indicated the existence of no group differences when parents' stress levels were high. However, when stress levels were low, mothers in the autistic group reported lower closeness in their relationships than mothers in the non-autistic group (see Fig. 1).

For the observed quality of mother-child interaction, the model including the variable that controlled for the presence of others during the observed task was significant, $R^2 = .23$, $FHC3(4, 97) = 7.49$, $p < .001$. The interaction term was not significant. The group variable was significant ($B = -.86$, $p < .05$), showing that interaction quality was lower in the autistic group than in the non-autistic group, as confirmed by ANOVA results in a previous section. The control variable referred to as "interruption by others" was also significant ($B = -.73$, $p < .05$), showing that the presence of children or adults other than the mother and the child in the environment was negatively associated with interaction quality.

Association between autism characteristics and relationship scores and parenting stress

Hierarchical regression analyses were conducted separately for perceived closeness and dysfunctional interaction (defined as the dependent variables) to examine the predictive value of autism characteristics (CARS2-ST score, defined as the independent variable) after controlling for covariates. To streamline the number of covariates, which included child's age, mother's age, family income, mother's education level, and data collection time, as well as interruption by others (in the analysis of global interaction quality score), correlations between outcome variables were examined. Child's age correlated positively with perceived closeness, while data collection time was positively correlated with the dysfunctional interaction subscale (see Table 4). Consequently, only these variables were included as covariates in the analysis of the specified outcomes. When the covariates were added, they were introduced in the first step, followed by the inclusion of the CARS2-ST score in the second step.

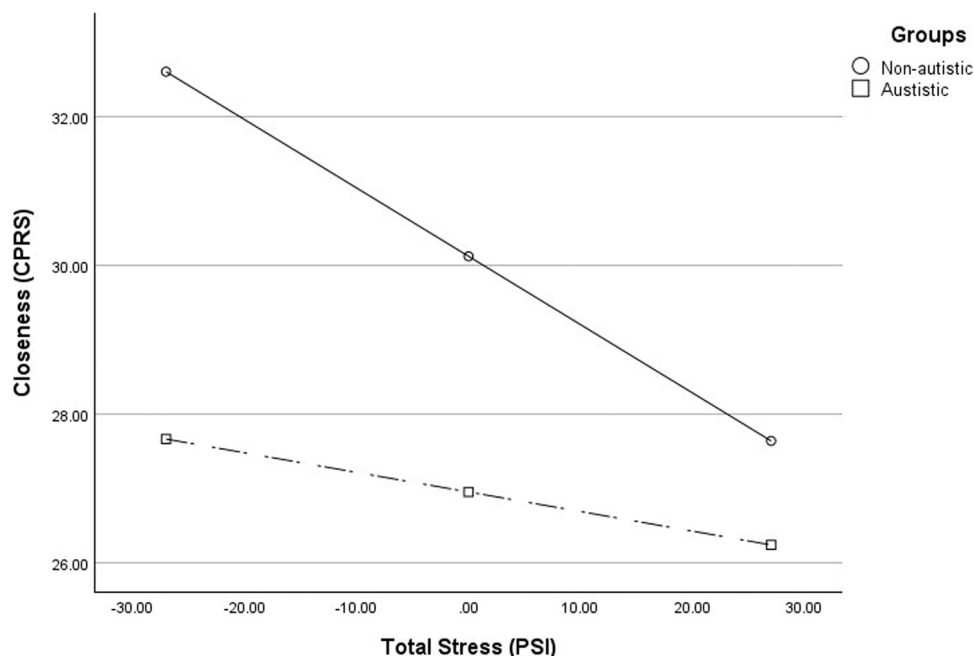


Fig. 1. Interaction between total PSI scores and group in predicting perceived closeness in mother-child interactions (PSI: Parental Stress Index; CPRS: Child-Parent Relationship Scale).

For perceived closeness, Model 1 with child's age was significant, $R^2 = .10$, $\text{adj}R^2 = .08$, $F(1, 53) = 5.59$, $p < .05$. Model 2 with CARS2-ST was also significant, $\Delta R^2 = .08$, $\text{adj}R^2 = .15$, $F_{\text{change}}(1, 52) = 5.32$, $p < .05$. Child's age was positively associated with closeness in the first step ($\beta = .31$, $p < .05$), but not in the second step. When all variables were entered into the equation, CARS2-ST was negatively associated with closeness ($\beta = -.30$, $p < .05$).

For dysfunctional interaction, Model 1 with data collection time as a control variable was not significant, $R^2 = .03$, $\text{adj}R^2 = .01$, $F(1, 54) = 1.61$, $p = .21$. However, Model 2, which incorporated the CARS2-ST total score, was significant, $\text{adj}R^2 = .11$, $\Delta R^2 = .11$, $F_{\text{change}}(1, 53) = 7.01$, $p < .05$, indicating a small to moderate effect. When all variables were included in the equation, autism characteristics were positively associated with dysfunctional interaction ($\beta = .34$, $p < .05$).

Discussion

The purpose of this study was to investigate parent–child relationships in the context of autism in detail. As hypothesized, the findings showed that mothers in the autistic group reported higher scores for perceived conflict and lower scores for perceived closeness in their relationships with their children. These findings are supported by previous research indicating that parents of autistic children report lower positive relationship scores than parents of non-autistic children (Riany et al., 2017) and also report less closeness and higher levels of conflict as measured by the CPRS than mothers of children with other developmental disabilities (Teague et al., 2018). However, Hoffman et al. (2009) showed no group difference in terms of emotional closeness as measured by the attachment subscale of the PSI (Abidin, 1995). This discrepancy in the literature may have arisen because the participants in the study by Hoffman et al. (2009) were drawn from an ongoing intervention project aimed at reducing behavioral problems in autistic children and supporting parents. Participation in such a support program might have positively influenced the parents' perceptions of closeness to their children.

Moreover, interestingly, although initial analyses revealed a significant group difference in perceived conflict, this effect was no longer significant when parenting stress was included in the model to test the moderation effect (see the section titled "The moderating role of parenting stress"). Instead, total parenting stress emerged as a strong predictor of perceived conflict. This suggests that the elevated levels of perceived conflict reported by parents of autistic children may be driven more by elevated stress levels than by autism group membership alone. Given that levels of parenting stress were substantially higher in the autistic group in this study, the group difference in perceived conflict may still be indirectly attributable to autism through its association with increased stress. Besides stress levels, mothers in the autistic group also reported higher levels of psychosocial problems in the current study, including anxiety and depression (see Supplementary Table 1). A meta-analysis found an increased prevalence of depressive symptoms among parents of autistic children (Scherer et al., 2019). These factors may have influenced their perceptions of their parent–child relationship. Additionally, a recent study conducted during the COVID-19 pandemic found a positive correlation between parents' anxiety and depression and perceived conflicts with their children, as well as a negative correlation with perceived closeness (Russell et al., 2020). Although the effect of the child's age was no longer significant after autism characteristics were included in the model (see the section titled "Association between autism characteristics and relationship scores and parenting stress") (it was initially positively associated with parents' perceived closeness. One possible explanation for this is that as children grow older, their communication and social skills may improve, facilitating more reciprocal and rewarding interactions. These developmental changes could, in turn, enhance parents' sense of closeness in the relationship.

In addition, for observed mother–child interaction quality, coded with the grid proposed by Moss et al. (1996), the autistic group had lower scores than the non-autistic group, as expected. In contrast to the current findings, Baker et al. (2010) found no difference between high- and low-probability autistic toddlers in terms of observed parenting structuring and emotional support. However, similar to the current study, a recent meta-analysis of high-probability autistic toddlers found that observed parent–infant interactions were significantly different from those of parents of non-autistic toddlers (Wan et al., 2019). This difference may be related to characteristics of autism, as the coding of interactions with the Moss's grid is largely based on the dyadic dimensions of the relationship, thus including the child's contributions in the coding. Autistic children are known to exhibit differences in social interaction and communication (Landa et al., 2007), which may explain the group differences in interaction quality scores. Travis et al. (2001) found that social understanding skills, such as joint attention and empathy, were positively associated with social interaction in autistic preschoolers but not in developmentally delayed peers. This suggests that autistic traits are closely related to social interaction quality. However, it is important to note that our correlation results did not support this finding, as the CARS2-ST scores were not associated with observed interaction quality. One possible explanation for this finding is that the CARS2-ST was not administered according to the standard observational protocol; due to pandemic-related constraints, data were collected via parent interviews rather than direct observations. However, the observed group difference might also be attributable to broader autism-related traits in dyads with autistic children, or the broader autism phenotype (BAP), which was not directly measured in the current study. A previous study showed that parents of autistic children had higher levels of BAP traits than parents of non-autistic children, and among mothers, higher BAP traits were associated with greater disturbances in the child's social responsiveness (Hasegawa et al., 2015). Future studies may benefit from directly assessing BAP traits, as these subclinical autism-related behaviors in parents could influence the quality of parent–child interactions.

Moreover, it is important to note that the groups in the current study were not matched for children's verbal abilities, which may be a relevant factor to consider while interpreting the results. However, the coding system that was used (Moss et al., 1996) captures both verbal and nonverbal aspects of communication, coordination, and role assumption; it is not solely dependent on verbal fluency. Furthermore, previous research has shown that differences in interaction and communication behaviors persist even when autistic children are matched with non-autistic peers for language level (Krupa et al., 2019, 2024), indicating that unique aspects of

parent–child interaction in autism extend beyond verbal development alone.

In terms of parental stress, as hypothesized, mothers of autistic children in the current study reported higher levels of stress as reflected by total PSI score and all PSI subscales (i.e., parental distress, parent–child dysfunctional interaction, and difficult child subscales). This finding is consistent with previous research that showed that parents of autistic children experience higher levels of stress compared to parents of non-autistic children (Hayes & Watson, 2013; Padden & James, 2017). They also experience higher levels of stress than parents of children with other developmental delays (Estes et al., 2013). The elevated stress levels experienced by parents of autistic children can be attributed to several challenges, including child-related factors such as behavioral problems (Al-Oran & Khuan, 2021; Estes et al., 2013; Wang et al., 2013), external factors such as social support and financial difficulties (Ilias et al., 2018; Wang et al., 2013), and individual-related factors such as coping skills (Shepherd et al., 2018), social support (Martinez & Turnage, 2022) or parenting self-efficacy (Strauss et al., 2024).

Regarding the moderating role of parenting stress for mother–child relationships between the groups, the findings showed that total parenting stress significantly moderated the association between group and perceived closeness, but not perceived conflict. Specifically, there were no group differences in perceived closeness with their children among mothers with high stress levels. However, among mothers with low stress levels, those with autistic children reported less closeness in their relationships than mothers of non-autistic children. Thus, perceived stress may be related to mothers' perceptions of positive relationships with their children. Although parents are important sources in reporting about their children, perceived stress may inevitably alter their perceptions of the quality of their relationships with their children. For example, a recent study showed that when parental stress is high, parents' ratings of their autistic children's challenging behaviors are more negative, but there is no association with the children's language development (Schwartzman et al., 2021). Similarly, Hickey et al. (2020) examined parents' perceptions of their autistic children by evaluating a five-minute speech. They found that mothers' stress levels were negatively associated with their warmth toward their children and positively associated with criticisms toward their children. Regarding perceived conflict, although the total PSI score did not moderate the association with the group variable, it was positively associated with perceived conflict. Based on the family stress model, this finding is unsurprising, as parenting stress influences relationships within the family environment as well as child adjustment (Masarik & Conger, 2017).

A moderating role of stress was not found for the observed quality of mother–child interaction. However, beyond their stress levels, mothers in the autistic group had lower scores for observed mother–child interaction quality. The different results obtained from self-reported and observed measures may be due to methodological issues. As noted above, parents' ratings of their relationships may vary depending on several personal characteristics, whereas observations made by others, such as clinicians and teachers, may not be affected by such factors (Schwartzman et al., 2021). In the current study, perceived relationships and observed interactions were not correlated in either the autistic or the non-autistic group, suggesting that these two different methods provide different perspectives of the concept. Furthermore, although parent-reported measures can offer valuable insights into parenting beliefs and the development of the child (Durgel et al., 2013), it is important to note that these perceptions may be influenced by personal factors (Hickey et al., 2020; Morsbach & Prinz, 2006). Observational methods can provide external information and help achieve a more complete picture of the studied concept, especially when other variables are reported by the same informant. Therefore, multi-source methods are suggested to increase the validity of results (Cossette-Côté et al., 2022).

Associations between autism characteristics and mother–child relationships and maternal stress levels in the autistic group were also examined. The findings showed small to moderate effect sizes, with autism characteristics positively associated with dysfunctional interaction and negatively associated with perceived closeness. Previous studies similarly found that levels of children's social impairment were positively associated with parenting stress (Ingersoll & Hambrick, 2011; Phetrasuwan & Shandor Miles, 2009). As difficulties in social interaction are one of the main characteristics of autism (American Psychiatric Association, 2013), these findings are not surprising. However, in contrast to the current findings, Beurkens et al. (2013) found that autism characteristics were not associated with perceived parent–child relationship quality but were negatively associated with observed parental relatedness in a small sample with a wide age range (4–14 years old). In the current study, autism characteristics were not associated with observed interaction quality. However, autism characteristics were negatively associated with observed parent–child interaction quality in another study (Hobson et al., 2016). Similarly, the observed interaction features of reciprocity and mutuality were previously associated with autism characteristics in high-probability autistic infant samples (Wan et al., 2019). As noted above, the CARS2-ST was not administered in its standard observational form in the current study; instead, these scores were based on parent interviews. This deviation from standard procedures may have prevented the measure from capturing the full range of autism characteristics, which may have contributed to the lack of association observed.

Conclusion and future research

The findings of this study contribute to the growing understanding of parent–child relationships in both autistic and non-autistic samples, particularly by showing that parents of autistic children report lower perceived closeness and higher conflict and stress. These findings support transactional models of development, which emphasize that child characteristics and increased caregiver stress might mutually influence relationship quality over time. Practically, this underscores the importance of providing support not only for child development but also for parental well-being and the relationship context. Future research should explore whether similar patterns are observed in fathers, as most studies, including the current one, focus predominantly on mothers. Fathers may experience and interpret the parent–child relationship differently. It would also be valuable to examine how parent–child dynamics evolve over time, particularly as children gain autonomy. Finally, future studies could include child-reported perspectives.

Strengths and limitations

The major contribution of the current study is its focus on mother–child relationships using different methods, including both self-report and observation techniques. Additionally, this study included a non-autistic comparison group to provide a more in-depth analysis of the results. Despite these strengths, the study has some limitations. First, the measures used in this study were primarily developed and validated with non-autistic samples and may not fully capture the relationship dynamics between autistic children and their parents. The factor structure may differ, as seen in the case of the PSI when used with parents of autistic children (Zaidman-Zait et al., 2011). However, using the same measure and factor structure for both autistic and non-autistic groups is necessary to allow for direct comparisons. Moreover, the reliability of the scales was consistently similar across the groups, supporting the appropriateness of these measures for comparative analysis. Nonetheless, researchers should be cautious while interpreting group differences. Furthermore, the reliability values were slightly below the acceptable threshold for perceived closeness (.69 for the non-autistic group and .70 for the autistic group); these results should be interpreted carefully. The data were largely collected during the COVID-19 pandemic, which may have influenced parental stress levels. To mitigate that influence, a control variable pertaining to data collection timing was included in the analysis. Another limitation is the measurement of CARS2-ST scores. Although the CARS2-ST is an observational instrument, it was coded via phone interviews in this study due to the pandemic conditions. Finally, diagnosis information was only provided by the parents. However, additional measures as described in the Method section indicated that the groups were significantly different in terms of autism characteristics.

CRediT authorship contribution statement

Ève-Line Bussi res: Writing – review & editing, Supervision, Methodology, Investigation, Funding acquisition, Conceptualization. **M lanie M. Couture:** Writing – review & editing. **Chantal Cyr:** Writing – review & editing, Methodology, Conceptualization. **Annie Stipanovic:** Writing – review & editing. **Karine Dubois-Comtois:** Writing – review & editing, Methodology, Conceptualization. **Delphine P riard-Lariv e:** Writing – review & editing, Project administration, Data curation. **Carole-Anne Leblanc:** Writing – review & editing, Data curation, Conceptualization. **Zeynep Ertekin:** Writing – review & editing, Writing – original draft, Formal analysis, Data curation, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.reia.2025.202753](https://doi.org/10.1016/j.reia.2025.202753).

Data availability

Data will be made available on request.

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