EXAMINING THE INTERACTION BETWEEN PARENT GENDER AND CHILD SEX ON STRESS AND COPING FOR PARENTS OF CHILDREN WITH AUTISM SPECTRUM DISORDER

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Abstract

Parents of children with autism experience elevated stress, but coping strategies are used to manage stressors. Previous research in these areas uses measures not normed for this population with low representation of fathers, and it is unclear whether child sex and parent gender interact to impact stress and coping. Analyses were conducted to explore this interaction using responses from 501 mother-father dyads, using original and new factor-analytically derived subscales for parenting stress (i.e., PSI-SF) and coping (i.e., F-COPES). With the new subscales, fathers of female children reported lower stress for *Child Limits* than mothers. Additionally, mothers of male children reported higher stress for *General Parental Distress, Behavioural Regulation, Child Limits,* and *Perceived Disagreeable Behaviour* than fathers. This suggests that stress is experienced differently between mothers and fathers of female or male children with ASD. The new subscales may be more sensitive and clinically advantageous to identify specific stressors and strengths.

Keywords: autism, parents, families, stress, coping

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Examining the Interaction between Parent Gender and Child Sex on Stress and Coping for Parents of Children with Autism Spectrum Disorder

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by deficits in social communication and interaction, as well as restrictive and repetitive behaviours, interests, and/or activities (American Psychiatric Association, 2013). Children with ASD may also have comorbid intellectual disability diagnoses, difficulties with daily living skills, as well as deficits in understanding non-verbal social cues and appropriate social behaviours compared to typically developing children (Cervantes et al., 2013; Esteves et al., 2021).

Parents of children with ASD experience major impacts on the family and parents also face greater levels of parenting stress compared to families of neurotypical children or children with other psychological disorders (Costa et al., 2017; Hayes & Watson, 2013; Hou et al., 2018) or developmental disabilities (Amireh, 2019), in addition to greater demands and burdens associated with caregiving responsibilities (Bozkurt et al., 2019). Compared to mothers of typically developing children, mothers of children with ASD tend to have weaker coping skills (Enea & Rusu, 2020). Additionally, fathers of children with mental health disabilities, including ASD, experience greater parenting distress compared to fathers of typically developing children (Darling et al., 2012).

Given these challenges and experiences with childrearing for these families, the purpose of this thesis is to examine parents' stress management and use of coping between mothers and fathers. The following sections will outline and review the current literature regarding parenting stress and coping, comparisons between mothers' and fathers' experiences, the measurement of stress and coping, followed by the gaps in the literature, and the purpose of this study.

Parenting Stress and Coping

One of many contributors to negative impacts experienced in the family is the presence of stressors (e.g., child characteristics but also life stressors such as divorce and death in the family; Perry, 2004), which are factors that may cause parents to experience distress. Child-related characteristics which are strong predictors of increased parenting stress include child IQ, child gender, child age, the severity of ASD symptoms, presence and severity of challenging behaviours (e.g., aggression or emotion regulation difficulties), and low proficiency in daily living skills (Enea & Rusu, 2020; Patel et al., 2022; Perry, 2004; Rivard et al., 2014). However, whether or to what extent parents experience distress from stressors can be influenced by coping strategies employed to handle the effects of stressors and the family's ability to adapt to challenges (Enea & Rusu, 2020). To aid parents in improving mental health and decreasing parenting stress, it is imperative that their stress and coping experiences be further understood.

Parents can utilize coping strategies to assist with perceiving or experiencing stress reduction. As outlined by Lazarus & Folkman (1984), there is a cognitive appraisal of a stressor, where the level of potential harm is evaluated. Following the appraisal of the stressor, coping strategies, which are behavioural responses to the stressor, are employed to reduce the perceived harm. However, the experience of stress occurs when a person appraises the stressor as significantly harmful and exceeds the resources available to reduce or address the stressor. This can lead to different stressors resulting in varying levels of perceived stress, where individuals can appraise the stress level of the same stressor differently. Effective stress reduction and adaptive coping response methods are oriented toward addressing or attempting to solve the stressor, as opposed to coping styles that avoid, downplay, or ignore the stressor. According to systematic reviews on family stress and coping (Dabrowska & Pisula, 2010; Verhnet et al.,

2018), parents of children with ASD can employ problem-focused coping (e.g., trying to solve or address the issue), emotion-focused coping (e.g., denying that the problem exists), positive coping (e.g., trying to view the issue through a more optimistic lens), or negative coping (e.g., using substances to distract or delay confrontation with the issue) to manage stressors. A recent systematic review by Vernhet and colleagues (2018) found that gravitation towards positive and problem-focused coping can be more beneficial and adaptive as opposed to negative and emotion-focused coping strategies, which are risk factors for greater parental stress and lower quality of life. However, it was also found that parents of children with ASD tend to use more avoidant coping strategies and fewer social support-seeking strategies than families of typically developing children.

Due to some of the challenging aspects of ASD symptoms, parents may expend additional efforts in child-rearing and coping compared to parents of typically developing children. For example, parents of children with ASD often face issues with financial difficulties, additional caretaking responsibilities, greater emotional demands, discrimination and stigma from the community or family members, and challenges with navigating the school and medical system (Benson & Kersh, 2011; Jarbrink et al., 2003; Khanlou et al., 2017; Rao & Beidel, 2009; Smith et al., 2010). Sex differences in ASD presentation between male and female children may also impact stress for parents. ASD is three to four times more commonly diagnosed in males compared to females, with sex differences in ASD traits and symptom presentation (Ratto et al., 2018; Werling & Geschwind, 2013). Current literature suggests that females with ASD tend to have fewer or lower severity in restrictive and repetitive behaviours and externalizing behaviours compared to males (e.g., aggression or hyperactivity; Ratto et al., 2018), but also tend to have greater internalizing symptoms compared to males (e.g., anxiety or depressive traits; Werling &

Geschwind, 2013). Additionally, sex differences in ASD characteristics may be dependent on age (Walsh et al., 2021). Older female children with ASD may have more severe impairments in social communication skill areas compared to males of the same age, but younger female children had stronger social-communication skills compared to other younger male children (Mahendiran et al., 2019). Despite some of the sex differences in ASD presentation, ASD should be viewed as a spectrum disorder, in which there are individual differences among autistic individuals; the severity of symptoms and differences in characteristics can vary and no two diagnoses will be the same. It should also be noted that neurobiological and genetic factors, alongside social-environment factors, can influence sex differences in ASD (Mahendiran et al., 2019; Walsh et al., 2021). Furthermore, parenting stress may also be impacted by social-environment factors related to parent-child interactions. According to Sameroff's (2009) transactional model of development, there is a bi-directional relationship between parents and their children. Parents and children form a social relationship with each other, where each party continually influences one another through social interactions, and this process may affect children's social-emotional development in addition to positive and negative parenting stress outcomes. Therefore, child sex along with ASD symptom presentation and severity can impact parenting stress, and these factors should be considered when examining differences between stress outcomes for mothers and fathers.

In line with Sameroff's (2009) model, longitudinal studies have found that parenting stress and children's challenging behaviours may have bi-directional cascading effects by influencing one another over time (Neece et al., 2012; Rodriguez et al., 2019; Zaidman-Zait et al., 2014). For parents of children with ASD, child-related characteristics and maladaptive behaviours can influence the social environment and increase parenting stress, which may then

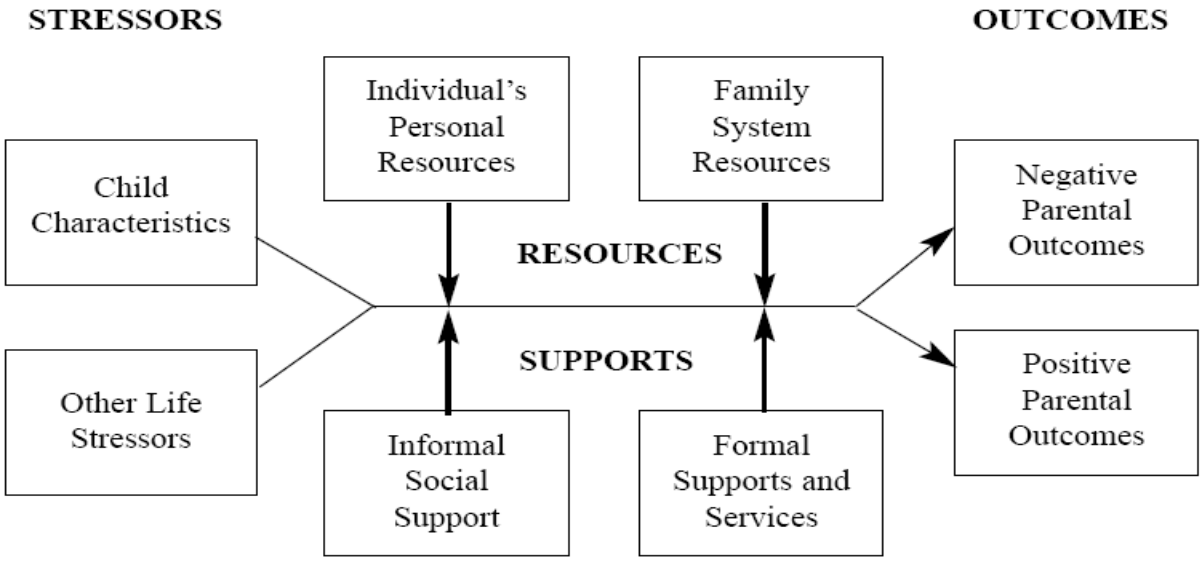
negatively affect the parent-child relationship and their social interactions with one another, leading to the further escalation of the presence or severity of the child's challenging behaviours. For example, in their longitudinal study with 188 mother-father dyads of children with ASD, Rodriguez et al. (2019) found that parenting stress predicted child internalizing symptoms at time 2; internalizing symptoms at time 2 predicted increased parenting stress at time 2, which then predicted greater internalizing symptoms at time 3 and 4. Therefore, parenting stress for families of children with ASD can also be understood as a dynamic process that is continually influenced by parent-child interactions and parenting stress management and experiences have important implications on children with ASD's development.

Additionally, children with ASD often have deficits in social communication skills, which impact the perceived quality and/or quantity of parent-child social interactions. This affects how the parent-child relationship is perceived, which may lead to parenting stress and negatively influence the social environment, as research has found that deficits in children's social communication skills were associated with greater overall parenting stress, parent-child relationship difficulties, and distress for both mothers and fathers (Davis & Carter, 2008). Furthermore, the severity and developmental trajectory of ASD characteristics such as social impairment and restrictive, repetitive behaviours may be associated with or more prevalent in specific age ranges or gender (Fountain et al., 2012; Waizbard-Bartov et al., 2022). For example, Waizbard-Bartov et al. (2022) found that ASD symptom severity decreased from early to middle childhood, and that girls with ASD were more likely to decrease in symptom severity compared to boys with ASD. Thus, ASD severity, child sex, and age may also impact the parent-child relationship, and these child variables should be considered when examining parenting stress and coping.

However, the Perry Model of Stress (Perry, 2004) posits that, aside from child-related factors and an individual's coping style, other domains must also be considered as they jointly contribute to how positive and negative family outcomes are experienced (refer to Figure 1 below; Perry, 2004). Through Perry's (2004) theoretical framework, parents' stress experiences are conceptualized holistically through the consideration of stressors (child characteristics and life stressors), personal and family system resources (coping strategies, family hardiness, marital satisfaction), and supports, both informal social support from friends, extended family, and/or neighbours, as well as formal (professional services or interventions for the child or family). The effects of stressors on parenting distress can be moderated or mediated by the presence and level of the resources and supports domains (Perry, 2004). For example, the usage of effective problem-focused coping strategies and reliable, high-quality social supports can buffer against the effects of stressors on parenting stress, resulting in greater positive parental outcomes (Enea & Rusu, 2020; Kuan et al., 2022). However, caregivers' perception of receiving social support has been found to have stronger associations with stress reduction than actual received social support (Robinson & Weiss, 2020). A study with mother-father dyads also revealed that the association between positive coping and reduced parenting stress was mediated by higher marital satisfaction (Brown et al., 2019), suggesting that family and couple factors may also impact individual parent stress and coping outcomes. In addition, all three domains are important in holistically understanding the relationship between raising a child with autism or developmental disabilities and both positive and negative family impacts. Thus, the stressors, resources, and supports as highlighted in the Perry Model of Stress (2004), along with child characteristics that may impact the parent-child relationship (e.g., ASD severity, age, sex) should be considered when examining parents' experiences with stress and coping.

Figure 1

The Perry Model of Stress



Differences between Mothers and Fathers

There may be parent-gender differences in childrearing practices. For example, a recent systematic review of families in different countries found that generally, mothers and fathers tend to gravitate toward using different parenting styles (e.g., authoritative vs. authoritarian; responsive vs. behaviourally controlling), although these gender differences may not apply similarly for families of children with ASD (Yaffe, 2020). Furthermore, Hu and colleagues (2019) examined 211 Chinese mother-father dyads and found that parenting behaviours and styles for mothers and fathers of children with ASD were independent, where mother-child and father-child dynamics do not influence stress and coping for one another between couples, as parents' experiences of parenting stress and coping were only associated with their own processes of emotion regulation for childrearing challenges and were not associated with those used by their partner. Although it was found that mother-father dyads may have a generally

similar parenting experience as their stress is associated with each other's (Patel et al., 2022), results from Hu and colleagues (2019) emphasize that mothers' and fathers' parenting stress and coping related to their child with ASD require separate examinations, as their childrearing practices and experiences with the same child may differ. This is further highlighted in studies that found greater positive experiences for mothers of children with ASD when compared to fathers (Kayfitz et al., 2010).

Mothers and fathers also identify different perceived sources and severity of parenting stress associated with their child with ASD (Flippin & Crais, 2011). A recent study with 683 mother-father dyads conducted by Li et al. (2022) found that maternal stress was higher than paternal stress, where parent-gender differences in stress depended on the child's ASD symptoms and severity. This is corroborated by a systematic review in which it was found that mothers were generally more stressed with both externalizing and internalizing behaviours of the child as well as the child's level of daily living skills, whereas fathers only identified externalizing behaviours and future employment prospects as their main source of stress or concern (Flippin & Crais, 2011). However, results from a study conducted by Allen et al. (2013) with mother-father dyads found that lower child communication and sociability skills predicted stress for mothers, whereas only child cognitive and sensory challenges predicted stress for fathers. Although the child's socialization challenges were associated with both increased maternal and paternal stress (Davis & Carter, 2008), a recent study of 683 mother-father dyads by Li et al. (2022) found that children's social impairment only predicted maternal distress. Therefore, these research studies highlight that there are parent-gender differences in predictors of stress between mothers and fathers, suggesting that differential factors contribute to parents' outcomes and experiences.

Mothers and fathers of children with ASD may also rely on or prefer using different coping strategies to aid in their reduction of parenting stress, where mothers may gravitate toward emotion-focused coping and fathers to use problem-focused coping (Dabrowska & Pisula, 2010). On the contrary, another study found the opposite; mothers of children with ASD used more positive problem-focused coping strategies than fathers (Pozo & Sarria, 2014). In addition, mothers were found to perceive stressors as more threatening (i.e., they feel that their coping resources are inadequate to address the stressor) than challenging (i.e., they anticipate having adequate coping resources to ensure a positive outcome) compared to fathers' perceptions of similar events, and the maternal tendency to appraise stressors as threats was associated with poorer maternal mental health outcomes (Kaniel & Siman-Tov, 2011). This is important to consider as the way in which stressors are conceptualized may impact how effective coping strategies are in reducing the experience of distress associated with ASD symptom severity, and thereby increasing quality of life (Ni'matuzahroh et al., 2022; Shepherd et al., 2018).

However, it should be noted that mixed findings regarding parent-gender differences in stress and coping may be related to the low representation of fathers in research through small sample sizes when compared to mothers, with few studies directly comparing parent-gender differences (Johnson & Simpson, 2013; Rankin et al., 2019). Furthermore, Rankin and colleagues (2019) recently conducted a systematic review of parent involvement in families of children with ASD and found that compared to mothers, fathers are often excluded or not represented in research, and have less general parental involvement in childrearing and participation in parent-mediated interventions. Thus, further research should be conducted to clarify parent-gender differences, where more sensitive methods are utilized while examining a

large sample of fathers to better conceptualize both mothers' and fathers' parenting stress and coping experiences.

Measuring Parenting Stress and Coping

Parenting stress and coping are both typically measured using self-report questionnaires. A recent systematic review conducted by Enea and Rusu (2020) revealed that the short form of the Parenting Stress Index (PSI-SF; Abidin, 1995) is one of the most commonly used measures of parenting stress for parents of children with ASD. The three subscales of the PSI-SF published by Abidin (1995) are *Parental Distress* (i.e., distress experienced due to being a parent), *Dysfunctional Parent-Child Interaction* (i.e., negative feelings as a result of poor social interactions with the child), and *Difficult Child* (i.e., issues with handling the child's challenging behaviours).

The Family Crisis Oriented Personal Evaluation Scales (F-COPES; McCubbin et al., 1991) is also frequently used as a measure of parent coping experiences. For the F-COPES subscales as published by McCubbin et al. (1991), the five subscales were *Acquiring Social Support* (i.e., receiving support from friends, family, or neighbours), *Reframing* (i.e., looking at the problem with a more positive perspective so it becomes more manageable), *Seeking Spiritual Support* (i.e., using religion or spirituality as a source of support), *Mobilizing the Family to Acquire or Accept Help* (i.e., seeking help from the wider community and accepting help from others), and *Passive Appraisal* (i.e., use of emotion-focused coping strategies).

The PSI-SF and F-COPES can be jointly used to conceptualize parents' experiences with stress and coping. For example, in a recent study conducted by Ntre and colleagues (2022), 143 Greek mothers of children with ASD were examined and it was found that scores on the *Reframing* subscale on the F-COPES was associated with lower *Parental Distress* scores on the

PSI-SF. Ntre et al. (2022) also found that greater use of *Passive Appraisal* coping methods was associated with higher scores on the *Dysfunctional Parent-Child Interaction* subscale, suggesting that mothers of children with ASD may use passive appraisal coping as a strategy to handle stress associated with poor interactions with their child. Furthermore, lack of social supports may act as a risk factor for poorer family outcomes as lower scores on the *Mobilizing the Family to Acquire or Accept Help* were associated with lower family quality of life.

In the current literature, there have been mixed findings on gender differences between mothers' and fathers' general experiences with parenting stress and coping when examining research that utilized the PSI-SF and/or the F-COPES (Dabrowska & Pisula, 2010; Enea & Rusu, 2020; Pozo & Sarria, 2014). According to a meta-analysis, many studies have concluded that mothers of children with ASD report experiencing greater general stress compared to fathers (Hayes & Watson, 2013). On the other hand, while some studies have found that paternal stress is greater overall, with fathers reporting higher scores on certain subscales of the PSI-SF (Davis & Carter, 2008; Enea & Rusu, 2020; Rivard et al., 2014), other studies have found no gender differences when comparing mothers and fathers on parenting stress (Pozo & Sarria, 2014). Conflicting and inconsistent findings regarding gender differences on the PSI-SF may be in part due to researchers using different methodologies concerning the *Parenting Distress* domain and/or using the total score of the PSI-SF to interpret parenting stress differences.

In a similar fashion as the PSI-SF, there have been conflicting findings on the direction of gender differences in general coping use as well as in specific domains of the F-COPES between mothers and fathers (Altiere & von Kluge, 2009; Lee, 2009; Twoy & Connolly, 2007), in addition to inconsistent findings on whether or not coping strategies differ between mothers and

fathers when analyzing F-COPES scores (Dabrowska & Pisula, 2010; McStay et al., 2014; Pozo & Sarria, 2014).

However, it should be noted that the PSI-SF and F-COPES measures were not developed or normed with the ASD population in mind. The conflicting findings regarding gender differences may be at least partially attributed to the inadequate psychometric properties of the PSI-SF and F-COPES for this specific population. It has been suggested that the scores derived from these measures may not fully capture the experience of parents of children with ASD. Some previous research has found differences in psychometric properties when non-normed parenting measures are used for this population, as well as alternative factor structures that are better psychometrically suited have been reported for the PSI-SF, for example (Shine et al., 2022; Zaidman-Zait et al., 2010; Zaidman-Zait et al., 2011).

In particular, a series of factor analyses conducted by Shine and colleagues (2022) in a large sample of Ontario parents of children with ASD resulted in the development of new subscales for both the PSI-SF and F-COPES that were more psychometrically appropriate compared to the factor structures of these measures as originally published. Refer to Shine (2021) for psychometric information regarding the exploratory and cross-validated confirmatory factor analyses between the original and new factor structures of the PSI-SF and F-COPES. These new factor analytically derived subscales were demonstrated to be empirically validated for both mothers and fathers and they are more specific to this population, thus allowing for a more nuanced understanding of different aspects of stress and coping that may better capture the experience of parents of children with ASD. Therefore, research examining and measuring parent stress and coping moving forward should consider using these new subscales.

Gaps in the Literature

Furthermore, most studies utilizing the PSI-SF and F-COPES measures to explore stress and coping for parents of children with ASD have mainly examined mothers and also have had limited sample sizes (e.g., Bohadana et al., 2019; Hou et al., 2018; Lai et al., 2015). Furthermore, there are few comparisons between mothers and fathers. Despite some literature exploring some gender differences in parenting stress and coping experiences, as reviewed above, most research has predominantly examined data from mothers of male children with ASD, and featured a small sample of fathers in analyses (if any) which is important to consider as fathers' experiences have historically been vastly underexplored in the literature (Johnson & Simpson, 2013; Rankin et al., 2019). In addition, comparisons between mothers and fathers generally examine small sample sizes that rely on volunteers for research studies (who are typically well-educated, higher SES volunteers) as opposed to recruiting diverse community-based samples, which could yield data that are more reflective of the population.

Moreover, no research study has explored the potential interaction between parent gender and child sex on parenting stress for families of children with ASD in detail, which is another gap in the literature. As mentioned previously, the discrepant sex ratio (4:1 for males to females) and the sex differences in ASD presentation and parent-gender norms and expectations with male and female children may contribute to mother-father differences in their experiences with parenting stress. However, it is unknown how these variables interact with each other to impact parenting stress. Although one small study of 118 Canadian francophone mother-father dyads found that fathers with female children reported higher scores on the PSI-SF than fathers with male children, parent-gender and child-sex factors were not explored as factors for parent coping (Rivard et al., 2014). Furthermore, the mother-father dyads in Rivard and colleagues' (2014)

sample had homogenous socioeconomic status levels and educational attainment, which may not be reflective of all parents of children with ASD. It is imperative to explore how parent-gender and child-sex factors interact with each other to accurately conceptualize and further understand how families of children with ASD experience stress, as well as how mothers' and fathers' stress outcomes are influenced. Additionally, more studies using Shine et al.'s (2022) new subscales for the PSI-SF and F-COPES to identify gender differences in parenting stress and coping are warranted to further explore the potentially increased psychometric sensitivity when using these measures for this population.

Purpose of the Current Study

The proposed factor structures by Shine et al. (2022) may result in the detection of more sensitive differences in parenting distress and coping between mothers and fathers of children with ASD. However, there have yet to be comparisons utilizing these proposed factor structures. Additionally, although Shine (2021) examined various child characteristics (e.g., age, sex, ASD severity) as predictors of parental stress and coping differentially between mothers and fathers, comparisons between the original and new subscales of the PSI-SF and F-COPES were not conducted, and differential comparisons for mothers and fathers of male or female children were not explored. To build on Shine et al.'s (2022) factor analyses by utilizing the new subscales and to address limitations in the literature, parent-gender differences and child-related variables should be further explored to conceptualize families' stress and coping experiences in a more sophisticated manner. Therefore, the primary objective of this study is to broaden our understanding of the stress and coping of parents of children with ASD by examining the potential interaction effect between parent gender and/or child sex on parents' stress and coping, using a large community sample of mother-father dyads. An emphasis will be placed on

exploring differences between mothers and fathers. However, directional hypotheses will not be made, as the literature on gender differences between mothers and fathers is quite mixed and there is only one small study that explored potential interactions between parent gender and child sex on stress outcomes.

A secondary objective is to compare and contrast the results from the first objective between Shine and colleagues' (2022) proposed subscales and those as originally published in order to validate the enhanced specificity of the new subscales in measuring the stress and coping experiences for parents of children with ASD.

Method

The current study was based on a secondary analysis of archival survey data collected by Shine et al. (2022) from a large community sample of parents of children who received a diagnosis of ASD. Parents and their children were referred to Surrey Place, which is a public service agency located in Toronto, Ontario, Canada, to apply for a behavioural intervention for their children. Data was then collected from parents who completed the PSI-SF and F-COPES measures at the time of their child's clinical assessment, which were administered routinely during the screening assessments at the agency from years 2000 to 2016. The current study has obtained ethics approval from the research ethics board at Surrey Place and the Human Participants Review Committee at York University.

Participants

Prior to cleaning the database according to the inclusion and exclusion criteria, the initial sample consisted of 2893 parents. Parents in the final database included only mother-father dyads to control for child-related and socioeconomic status confounds. Inclusion criteria included: mothers and fathers of the same clinically diagnosed child with ASD (verified through

CARS score of above 30.0) and completion of either one of the PSI-SF or F-COPES measures, or both.

If there were missing data, participants were retained as long as less than 20% was missing. Parents with more than one item missing on the Defensive Responding scale of the PSI-SF were excluded from the study.

The final sample included mother-father dyads (i.e., mothers and fathers of the same child) of 501 children: 420 with male children and 81 with female children. Median family income information was based on families' neighbourhoods and cross-referenced with their postal code using the 2006 Canadian Census data (Statistics Canada, 2006). Although data pertaining to parents' martial status and racial or cultural background were not available, this community-based sample has a large representation of immigrant families and is known to be very diverse based on the demographics of the city and of the communities that Surrey Place serves (e.g., Kuan et al., 2022). See Table 1 below for child demographics and diagnostic scores.

Table 1

Child Demographic Information

	M (SD)	Range
Age (months)[a]	44.14 (13.13)	20-83
Childhood Autism Rating Scale score[a]	33.56 (2.82)	30.0-44.5
Vineland Adaptive Behavior Composite score[b]	60.10 (8.92)	35.0-83.33
Median income ($CAD)[a]	53,532 (13,030)	30,465-104,862

[a]n = 501; [b]n = 459

Measures

Child Measures

ASD Severity. Depending on when the initial clinical assessment was conducted on the child with ASD, clinicians administered the first or second edition of the Child Autism Rating Scale was used to determine the severity of ASD symptoms (CARS; Schopler et al., 1988; Schopler et al., 2010). This measure consists of 15 items, each rated on a 7-point Likert scale (1 to 4, with half points). Scores can range from 15 to 60. Scores under 30 suggested minimal or absence of ASD, scores between 30 and 36.5 represented mild/moderate severity, and scores above 37 are considered severe. The CARS and CARS-2 have excellent internal consistency levels (α = .94 and .93, respectively). To ensure that the final sample only included families of children with ASD, children with a CARS score below 30.0 (n = 313) were removed from the dataset, resulting in a final sample of 501 children.

Adaptive Behaviour. Clinicians administered either the first or second edition of the Vineland Adaptive Behavior Scale interview form (Sparrow et al., 1984; Sparrow et al., 2005) to determine adaptive behaviour level. Domains in this measure included communication, daily living skills, and socialization, which can be combined and interpreted as the Adaptive Behavior Composite score, with higher scores indicating greater levels of adaptive behaviours.

Parent Measures

Parenting Stress. On the PSI-SF, parents indicated their agreement to statements on a 5-point Likert scale. The original subscales of the PSI-SF published by Abidin (1995) include *Parental Distress* (i.e., distress experienced due to being a parent of a child with ASD; items 1-12), *Dysfunctional Parent-Child Interaction* (i.e., negative feelings as a result of poor social

interactions with the child; items 13-24), and *Difficult Child* (i.e., issues with handling the child's challenging behaviours; items 25-36).

The new subscales by Shine et al. (2022) include *General Parental Distress* (i.e., distress generally related to being a parent of a child with ASD; items 1-12, 22), *Behavioural Regulation* (i.e., child behaviours and emotion regulation capabilities; 25, 26, 27, 29, 30, 31), *Reciprocity* (i.e., reciprocal social relationship between the parent and child; 13-17, 19, 23), *Child Limits* (i.e., emotional or physical demands from the child placed on the parent; 18, 20, 21, 32, 36), and *Perceived Disagreeable Behaviour* (i.e., child behaviours that parents deem undesirable or oppositional; items 24, 28, 33, 34, 35). See Table 2 below for internal reliability between mothers and fathers for both old and new subscales, which had acceptable levels and reliability for the new subscales were comparable to the original subscales.

Table 2

PSI-SF and F-COPES Internal Reliability

	Mothers (α)	Fathers (α)
Original PSI-SF (Abidin, 1995)		
Parental Distress	.917	.905
Dysfunctional Parent-Child Interaction	.839	.834
Difficult Child	.887	.879
New PSI-SF (Shine et al., 2022)		
General Parental Distress	.912	.901
Behavioural Regulation	.824	.832
Reciprocity	.829	.834
Child Limits	.749	.754
Perceived Disagreeable Behaviour	.820	.794
Original F-COPES (McCubbin et al., 1991)		
Acquiring Social Support	.811	.828
Reframing	.765	.735
Seeking Spiritual Support	.877	.898
Mobilizing the Family to Acquire or Accept Help	.664	.623
Passive Appraisal	.605	.539
New F-COPES (Shine et al., 2022)		
Social Support from Friends/Family	.798	.809
Self-Efficacy	.743	.733
Religious Participation/Coping	.877	.898
Passive-Avoidant Coping	.605	.539
Formal Supports	.664	.623
Support from Neighbours	.739	.747
Acceptance	.675	.557

Parent Coping. On the original F-COPES subscales by McCubbin et al. (1991), parents indicated their agreement to statements on a 5-point Likert scale that encompassed *Acquiring Social Support* (i.e., receiving support from friends, family, or neighbours; items 1, 2, 5, 8, 10, 16, 20, 25, 29), *Reframing* (i.e., looking at the problem with a more positive perspective so it becomes more manageable; items 3, 7, 11, 13, 15, 19, 22, 24), *Seeking Spiritual Support* (i.e., using religion or spirituality as a source of support; items 14, 23, 27, 30), *Mobilizing the Family to Acquire or Accept Help* (i.e., seeking help from the wider community and accepting help from others; items 4, 6, 9, 21), and *Passive Appraisal* (i.e., use of emotion-focused coping strategies; items 12, 17, 26, 28, which are all reverse coded).

The new F-COPES subscales proposed by Shine and colleagues (2022) include *Social Support from Friends/Family* (items 1, 2, 5, 16, 20, 25), *Self-Efficacy* (i.e., belief in the family's ability to solve and handle problems; 3, 7, 11, 13, 22, 24), *Religious Participation/Coping* (i.e., use of religious or spiritual activities; items 14, 23, 27, 30), *Passive-Avoidant Coping* (i.e., emotion-focused coping; items 12, 17, 26, 28, which are all reverse coded), *Formal Supports* (i.e., seeking services from professionals such as psychologists; items 4, 6, 9, 21), *Support from Neighbours* (items 8, 10, 29), and *Acceptance* (i.e., accepting the stressful event into their life; items 15, 19). See Table 2 for internal reliability between mothers and fathers for both old and new subscales. Most were acceptable but reliability for some subscales was low likely due to these subscales having few items.

Data Analysis

Using profile analyses to address the primary objective of this study, mother-father dyad scores on each of the PSI-SF and F-COPES subscales were compared for parent gender and child sex differences in parenting stress and coping, while also considering potential parent gender and

child sex interaction effects for differences within and between subscale scores. These analyses were conducted through using the General Linear Model – Repeated Measures analysis function in SPSS 29, as the mother-father dyadic data is non-independent. Multivariate analyses were also used to circumvent concerns regarding sphericity assumption violations and to reduce the risk of Type I error. The two within-subjects factors were parent gender and each of the PSI-SF or F-COPES subscales, and the child sex was the between-subjects variable. An alpha level of $\alpha = .05$ along with appropriate effect sizes were interpreted to evaluate the significance and magnitude of results.

To address the secondary objective, the profile analyses will be conducted using both the original (i.e., as published by their original authors) and new factor analytically derived subscales from Shine and colleagues (2022). Results will then be qualitatively compared and contrasted to discuss similarities or differences in findings between the original and new subscales.

Results

Parenting Stress Comparisons

Original PSI-SF Subscales

See Table 3 for descriptive statistics and refer to Table 4 for repeated measures ANOVA and within-subjects contrasts results. Box's M test revealed that the assumption of equal covariance matrices across groups was met M (21, 71475.34) = 22.81, p = .39. There was a significant main effect of parent gender where mothers reported higher overall parenting stress than fathers, with a small effect (η_p^2 = .015). Additionally, there was a significant interaction effect between parent gender and subscale type, with a small to moderate effect (η_p^2 = .053). The interaction between child sex and subscale type was also found to be significant. However, the

main effect of child sex, along with the joint interaction between parent gender * child sex * subscale type were not significant.

Table 3

Descriptive Statistics – Original PSI-SF Subscales

	Parent Gender	Child Sex	*M* (*SD*)
Parental Distress	Mothers	Male[a]	2.76 (.93)
		Female[b]	2.63 (.92)
	Fathers	Male[a]	2.60 (.86)
		Female[b]	2.46 (.78)
Dysfunctional Parent-Child Interaction	Mothers	Male[a]	2.58 (.71)
		Female[b]	2.61 (.62)
	Fathers	Male[a]	2.58 (.68)
		Female[b]	2.64 (.63)
Difficult Child	Mothers	Male[a]	3.28 (.85)
		Female[b]	3.27 (.81)
	Fathers	Male[a]	3.13 (.81)
		Female[b]	3.19 (.81)

[a]*n* = 396; [b]*n* = 79

Table 4

Multivariate Repeated Measures ANOVA – Original PSI-SF Subscales

	df (within, between)	*F*	*p*	η_p^2
Parent Gender	1, 473	7.19	.008*	.015
Child Sex	1, 473	.082	.774	.001
Parent Gender * Subscale	2, 472	13.29	<.001*	.053
Child Sex * Subscale	2, 472	3.20	.042*	.013
Parent Gender * Child Sex * Subscale	2, 472	.310	.734	.001

Post-hoc pairwise comparisons were then conducted for the significant interaction effects. See Table 5 below for details. For the interaction effect between parent gender * subscale type, there were gender differences in ratings of stress within subscales. Mothers reported having significantly greater *Parental Distress* compared to fathers (mean difference = .16, *SE* = .05, 95% CI [.07, .26]). Additionally, mothers reported more stress regarding *Difficult Child* than fathers (mean difference = .11, *SE* = .04, 95% CI [.04, .19]). See Figure 2 for the profile analysis plot of this significant interaction effect.

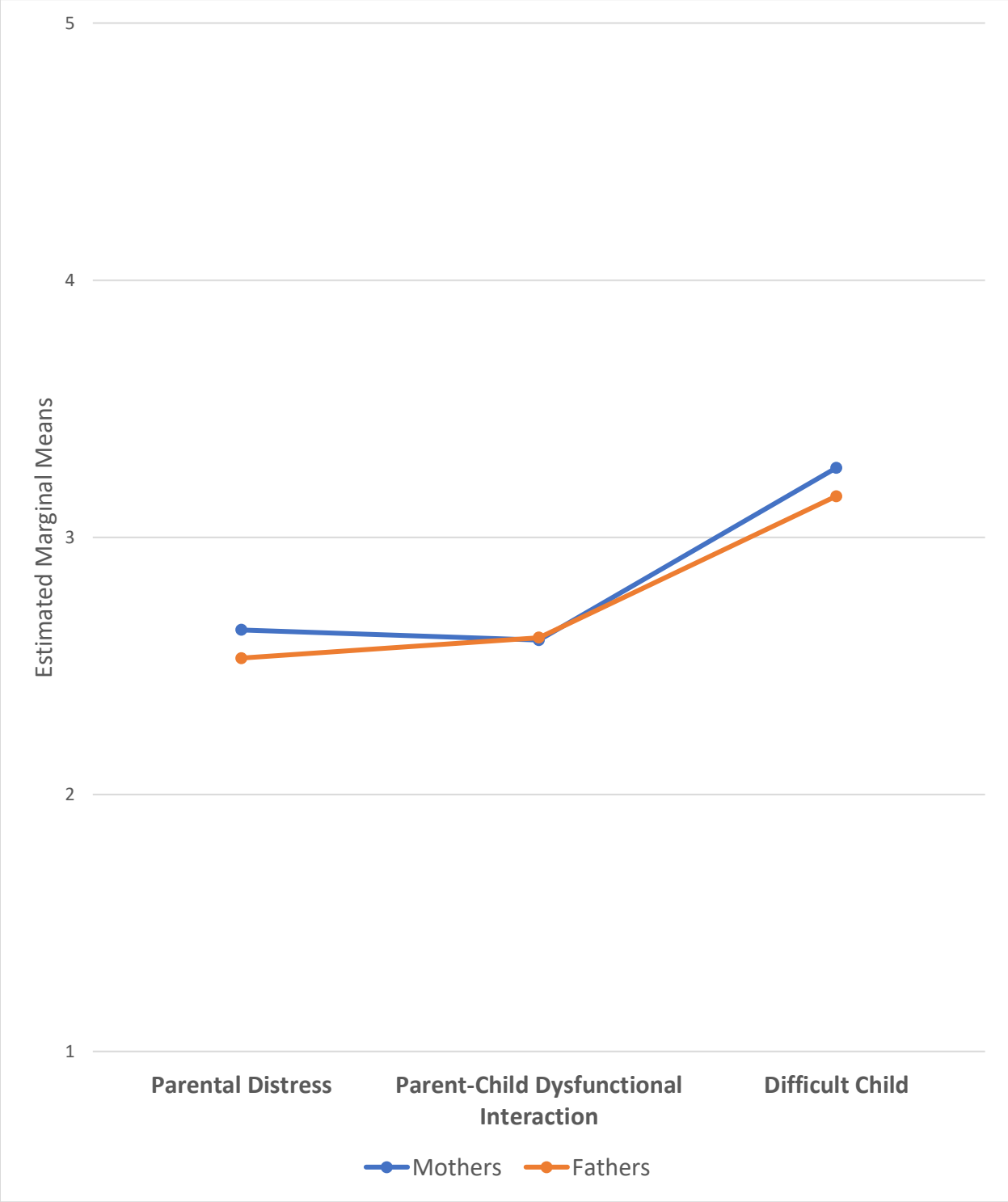
Table 5

Post-Hoc Pairwise Comparisons – Original PSI-SF Subscales

	Mean Difference	*SE*	*p*	95% CI
Parent Gender * Subscale				
Parental Distress				
Mothers – Fathers	.16	.05	<.001*	[.07, .26]
Dysfunctional Parent-Child Interaction				
Mothers – Fathers	-.01	.04	.701	[-.09, .06]
Difficult Child				
Mothers – Fathers	.11	.04	.003*	[.04, .19]
Child Sex * Subscale				
Parental Distress				
Males – Females	.14	.10	.167	[-.06, .33]
Dysfunctional Parent-Child Interaction				
Males – Females	-.04	.08	.561	[-.19, .11]
Difficult Child				
Males – Females	-.03	.09	.788	[-.21, .16]

Figure 2

*Profile Plot for Parent Gender * Subscale – Original PSI-SF Subscales*



Regarding the interaction between child sex * subscale type, child sex differences in subscale stress ratings for male and female children were not significant. Although significant differences between subscales were found within child sex (e.g., higher stress ratings in a subscale for males compared to another subscale), these results were not of interest to the current study, and thus will not be interpreted.

New PSI-SF Subscales

Refer to Table 6 for descriptive statistics and Table 7 for multivariate repeated measures ANOVA and within-subjects contrasts results. Box's M test revealed that the assumption of equal covariance matrices across groups was not met M (55, 66108.38) = 89.37, p = .006, thus, Pillai's trace was used. Similar to the original PSI-SF subscales, there was a main effect of parent gender, where mothers reported greater overall parenting stress compared to fathers, with a small effect (Pillai's Trace = .014). A significant interaction effect of parent gender * subscale was similarly found as well, with a small to moderate effect (Pillai's Trace = .043). Furthermore, the main effect of child sex, as well as the interaction between child sex * subscale type were not significant. However, an interaction effect was significant between parent gender * child sex * subscale type, with a small effect (Pillai's Trace = .022).

Table 6

Descriptive Statistics – New PSI-SF Subscales

	Parent Gender	Child Sex	*M* (*SD*)
General Parental Distress	Mothers	Male[a]	2.71(.90)
		Female[b]	2.58(.87)
	Fathers	Male[a]	2.57 (.83)
		Female[b]	2.42 (.74)
Behavioural Regulation	Mothers	Male[a]	3.19 (.93)
		Female[b]	3.19 (.88)
	Fathers	Male[a]	3.06 (.91)
		Female[b]	3.21 (.78)
Reciprocity	Mothers	Male[a]	2.15 (.85)
		Female[b]	2.15 (.80)
	Fathers	Male[a]	2.15 (.82)
		Female[b]	2.22 (.78)
Child Limits	Mothers	Male[a]	3.89 (.80)
		Female[b]	3.97 (.81)
	Fathers	Male[a]	3.81 (.79)
		Female[b]	3.75 (.80)
Perceived Disagreeable Behaviour	Mothers	Male[a]	2.92 (.99)
		Female[b]	2.85 (.96)
	Fathers	Male[a]	2.77 (.94)
		Female[b]	2.79 (.98)

[a]*n* = 403; [b]*n* = 80

Table 7

Multivariate Repeated Measures ANOVA – New PSI-SF Subscales

	df (within, between)	*F*	*p*	η_p^2
Parent Gender	1, 481	6.84	.009*	.014
Child Sex	1, 481	.021	.885	.001
Parent Gender * Subscale	4, 478	5.34	<.001*	.043
Child Sex * Subscale	4, 478	1.67	.157	.014
Parent Gender * Child Sex * Subscale	4, 478	2.65	.033*	.043

See Table 8 below for post-hoc pairwise comparisons information. For the interaction of parent gender * subscale type, when comparing parent gender differences within subscales, significant differences were found where mothers reported higher ratings of *General Parental Distress* (mean difference = .15, *SE* = .04, 95% CI [.06, .23]), *Child Limits* (mean difference = .15, *SE* = .04, 95% CI [.07, .24]), and *Perceived Disagreeable Behaviour* (mean difference = .10, *SE* = .05, 95% CI [.01, .19]) compared to fathers. See Figure 3 for the profile plot for this interaction effect.

Table 8

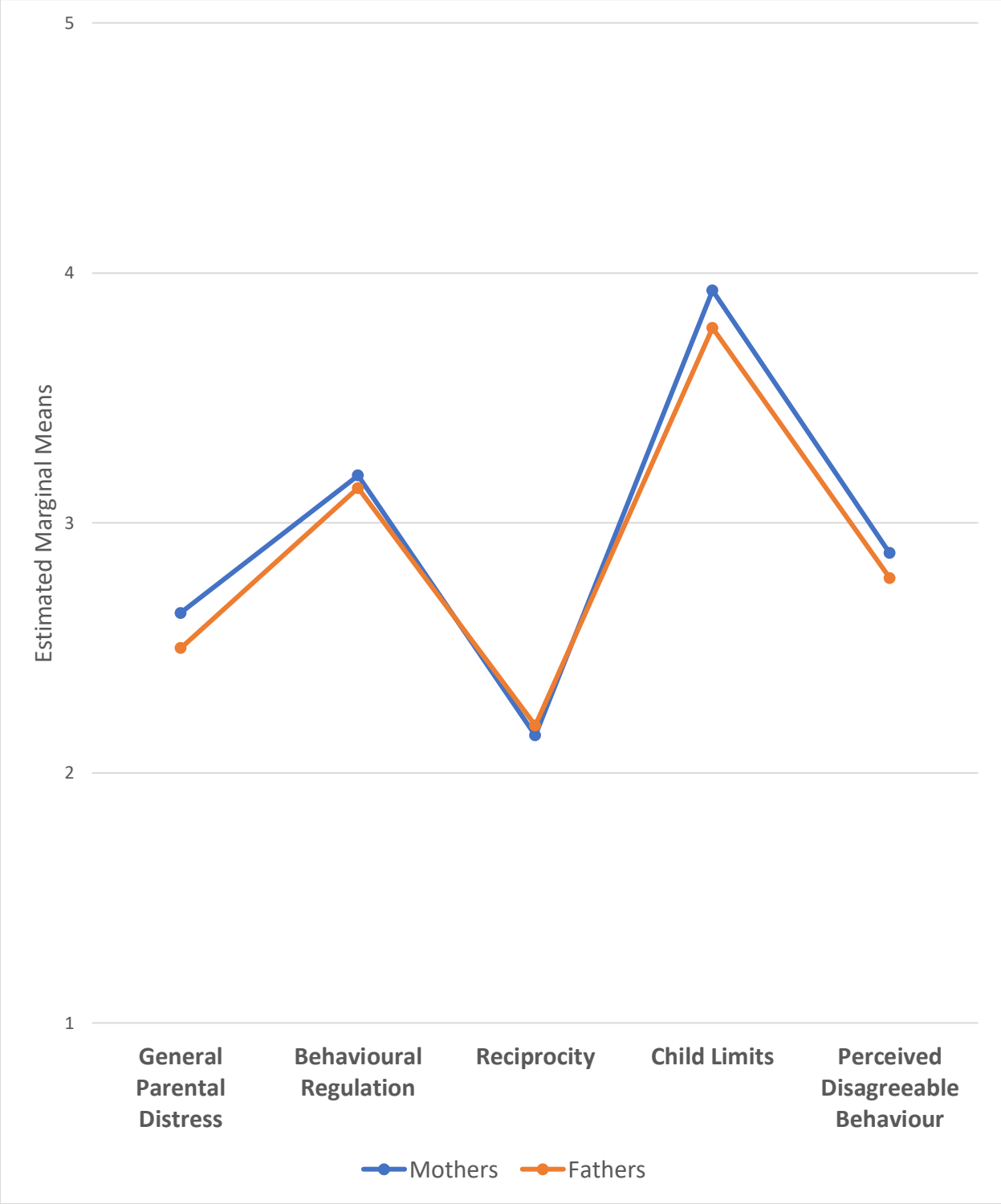
Post-Hoc Pairwise Comparisons – New PSI-SF Subscales

	Mean Difference	*SE*	*p*	95% CI
Parent Gender * Subscale				
General Parental Distress				
Mothers – Fathers	.15	.04	.001*	[.06, .23]
Behavioural Regulation				
Mothers – Fathers	.05	.04	.197	[-.03, .14]
Reciprocity				
Mothers – Fathers	-.04	.05	.420	[.-13, .05]
Child Limits				
Mothers – Fathers	.15	.04	<.001*	[.07, .24]
Perceived Disagreeable Behaviour				
Mothers – Fathers	.10	.05	.028*	[.01, .19]
Parent Gender * Child Sex * Subscale				
Mothers				
General Parental Distress				
Males – Females	.13	.11	.223	[-.08, .35]
Behavioural Regulation				
Males – Females	.001	.11	.996	[-.22, .22]
Reciprocity				
Males – Females	.001	.10	.993	[-.20, .20]
Child Limits				
Males – Females	-.07	.10	.471	[-.26, .12]
Perceived Disagreeable Behaviour				
Males – Females	.07	.12	.58	[-.17, .31]
Fathers				
General Parental Distress				
Males – Females	.15	.10	.135	[-.05, .35]
Behavioural Regulation				
Males – Females	-.15	.11	.180	[-.36, .07]
Reciprocity				
Males – Females	-.06	.10	.520	[-.26, .13]
Child Limits				
Males – Females	.05	.10	.577	[-.14, .25]
Perceived Disagreeable Behaviour				
Males – Females	-.01	.12	.927	[-.24, .22]

Male Children				
General Parental Distress				
Mothers – Fathers	.14	.04	<.001*	[.07, .21]
Behavioural Regulation				
Mothers – Fathers	.13	.03	<.001*	[.06, .19]
Reciprocity				
Mothers – Fathers	-.004	.04	.908	[-.08, .07]
Child Limits				
Mothers – Fathers	.09	.04	.012*	[.02, .16]
Perceived Disagreeable Behaviour				
Mothers – Fathers	.14	.04	<.001*	[.07, .22]
Female Children				
General Parental Distress				
Mothers – Fathers	.15	.08	.057	[-.01, .31]
Behavioural Regulation				
Mothers – Fathers	-.02	.08	.796	[-.17, .13]
Reciprocity				
Mothers – Fathers	-.07	.08	.406	[-.23 .10]
Child Limits				
Mothers – Fathers	.21	.08	.007*	[.06, .37]
Perceived Disagreeable Behaviour				
Mothers – Fathers	.07	.09	.451	[-.10, .23]

Figure 3

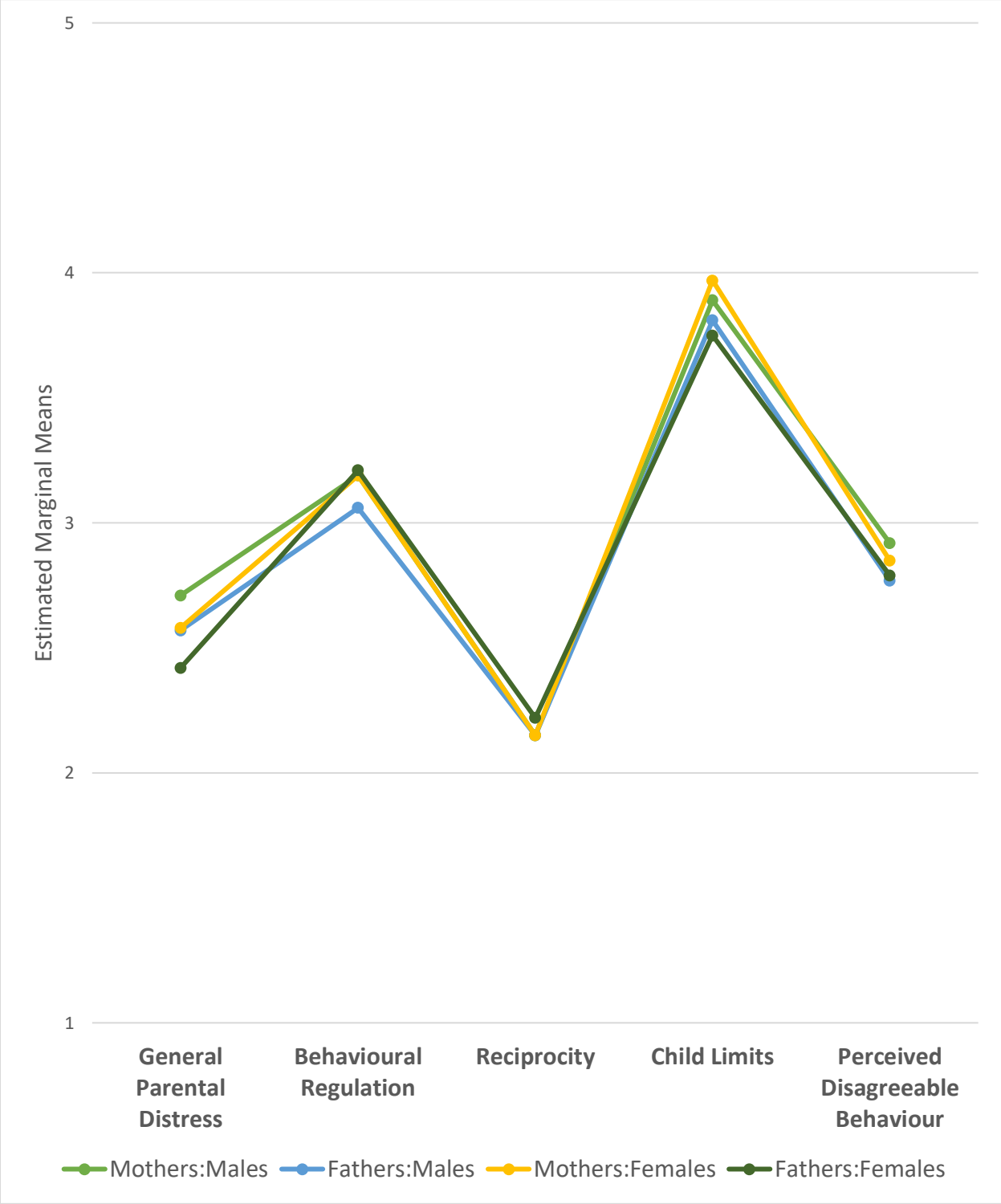
*Profile Plot for Parent Gender * Subscale – New PSI-SF Subscales*



Examining the interaction of parent gender * child sex * subscale type, significant differences in stress ratings were found between parent gender for male and female children, but not between child sex for mothers and fathers. Mothers of female children reported greater stress regarding challenges with *Child Limits* than fathers (mean difference = .21, *SE* = .08, 95% CI [.06, .37]). Additionally, mothers of male children had higher ratings of stress across the subscales of *General Parental Distress* (mean difference = .14, *SE* = .04, 95% CI [.07, .21]), *Behavioural Regulation* (mean difference = .13, *SE* = .03, 95% CI [.06, .19]), *Child Limits* (mean difference = .09, *SE* = .04, 95% CI [.02, .16]), and *Perceived Disagreeable Behaviour* (mean difference = .14, *SE* = .04, 95% CI [.07, .22]) when compared with fathers. See Figure 4 for the profile plot of the interaction effect.

Figure 4

*Profile Plot for Parent Gender * Child Sex * Subscale – New PSI-SF Subscales*



Parent Coping Comparisons

Original F-COPES Subscales

See Table 9 for descriptives and Table 10 for the multivariate repeated measures ANOVA and within-subjects contrasts results. Box's M test revealed that the assumption of equal covariance matrices across groups was met M (55, 41522.41) = 52.65, p = .68. Results of the analysis revealed no statistically significant main effects or interaction effects for differences in parent coping scores.

Table 9

Descriptive Statistics – Original F-COPES Subscales

	Parent Gender	Child Sex	*M* (*SD*)
Acquiring Social Support	Mothers	Male[a]	2.94 (.79)
		Female[b]	2.96 (.76)
	Fathers	Male[a]	2.83 (.81)
		Female[b]	2.93 (.70)
Reframing	Mothers	Male[a]	3.79 (.63)
		Female[b]	3.83 (.62)
	Fathers	Male[a]	3.79 (.60)
		Female[b]	3.89 (.58)
Seeking Spiritual Support	Mothers	Male[a]	3.95 (1.23)
		Female[b]	2.81 (1.31)
	Fathers	Male[a]	2.92 (1.25)
		Female[b]	2.75 (1.32)
Mobilizing the Family to Acquire or Accept Help	Mothers	Male[a]	3.79 (.86)
		Female[b]	3.80 (.80)
	Fathers	Male[a]	3.81 (.84)
		Female[b]	3.90 (.69)
Passive Appraisal	Mothers	Male[a]	3.79 (.83)
		Female[b]	3.69 (.88)
	Fathers	Male[a]	3.79 (.78)
		Female[b]	3.78 (.76)

[a]*n* = 348; [b]*n* = 64

Table 10

Multivariate Repeated Measures ANOVA – Original F-COPES Subscales

	df (within, between)	*F*	*p*	η_p^2
Parent Gender	1, 410	.067	.796	.001
Child Sex	1, 410	.087	.769	.001
Parent Gender * Subscale	4, 407	2.24	.064	.022
Child Sex * Subscale	4, 407	1.32	.261	.013
Parent Gender * Child Sex * Subscale	4, 407	.005	1.00	.000

New F-COPES Subscales

Refer to Table 11 for descriptive statistics and Table 12 for the multivariate repeated measures ANOVA and within-subjects contrasts results. Box's M test revealed that the assumption of equal covariance matrices across groups was met M (105, 40528.18) = 115.46, p = .45. Similar to the analysis for the original F-COPES subscales, there were no significant main or interaction effects for the new subscales.

Table 11

Descriptive Statistics – New F-COPES Subscales

	Parent Gender	Child Sex	*M* (*SD*)
Social Support from Friends/Family	Mothers	Male[a]	3.35 (.91)
		Female[b]	3.34 (.83)
	Fathers	Male[a]	3.24 (.92)
		Female[b]	3.31 (.78)
Self-Efficacy	Mothers	Male[a]	3.73 (.71)
		Female[b]	3.84 (.64)
	Fathers	Male[a]	3.75 (.67)
		Female[b]	3.90 (.65)
Religious Participation/Coping	Mothers	Male[a]	3.03 (1.23)
		Female[b]	2.81 (1.31)
	Fathers	Male[a]	2.89 (1.26)
		Female[b]	2.75 (1.32)
Passive-Avoidant Coping	Mothers	Male[a]	3.80 (.83)
		Female[b]	3.69 (.88)
	Fathers	Male[a]	3.79 (.77)
		Female[b]	3.76 (.68)
Formal Supports	Mothers	Male[a]	3.78 (.87)
		Female[b]	3.80 (.80)
	Fathers	Male[a]	3.80 (.77)
		Female[b]	3.90 (.69)
Support from Neighbours	Mothers	Male[a]	2.14 (.97)
		Female[b]	2.21 (1.01)
	Fathers	Male[a]	2.04 (.96)
		Female[b]	2.16 (.93)

Acceptance	Mothers	Male[a]	3.94 (.80)
		Female[b]	3.78 (.84)
	Fathers	Male[a]	3.93 (.83)
		Female[b]	3.88 (.76)

[a]*n* = 336; [b]*n* = 64

Table 12

Multivariate Repeated Measures ANOVA – New F-COPES Subscales

	df (within, between)	*F*	*p*	η_p^2
Parent Gender	1, 398	.102	.750	.001
Child Sex	1, 398	.007	.935	.001
Parent Gender * Subscale	6, 393	1.51	.173	.023
Child Sex * Subscale	6, 393	1.84	.091	.027
Parent Gender * Child Sex * Subscale	6, 393	.077	.998	.001

Discussion

Patterns of parenting stress and coping among mothers and fathers of male or female children with ASD have been unclear in the literature. This is a challenging topic because of the sex ratio in ASD (4:1 for males to females) and because fathers are not proportionately represented in samples. Thus, the purpose of the current study was to broaden our understanding of families' experiences with parenting stress and coping by examining the interaction between parent gender and/or child sex, using a large community-based sample of mother-father dyads of children with ASD. Furthermore, as commonly used measures of stress and coping in research and clinical practice were not normed with this population in mind, additional analyses were also conducted to explore differences in stress and coping patterns for parents of children with ASD

across two factor structures of the PSI-SF and the F-COPES; as published by their original authors (Abidin, 1995; McCubbin et al., 1991) and as proposed by Shine and colleagues' (2022) recent factor analyses.

With the PSI-SF, parent-gender differences were similarly found in analyses using subscales by Abidin (1995) and Shine et al. (2022), where mothers reported greater overall parenting distress compared to fathers in both the *Parental Distress* and *General Parental Distress* domains. Mothers also reported greater stress than fathers regarding their child's challenging behaviours in the *Difficult Child* subscale, as well as the similar new subscales of *Child Limits* and *Perceived Disagreeable Behaviour*. Similar parent-gender differences in results with both factor structures may be due to nearly identical questionnaire items used in Shine et al.'s (2022) re-configuration of the subscale compared to the original factor structure.

This aligns with consistent findings from systematic reviews which suggest that mothers report higher parental distress than fathers (Enea & Rusu, 2020; Flippin & Crais, 2011). Additionally, these results also align with the study conducted by Li and colleagues (2022) in which maternal stress was higher than paternal stress, and mothers reported a strong source of their stress relating to externalizing and internalizing behaviours of the child as well as the child's level of daily living skills, which are similar to the *Difficult Child, Child Limits* and *Perceived Disagreeable Behaviour* subscales. However, the subscales by Shine and colleagues (2022) suggest further specificity and sensitivity regarding the particular child characteristics that mothers in our sample perceived to be related to more distress. For example, the newly revised subscales further subset the areas within *Difficult Child* into the *Behavioural Regulation* subscale and an additional factor of *Child Limits.* As opposed to the original *Difficult Child* subscale which only described stress associated with handling the child's challenging behaviours, both of

the new subscales encompass more specific areas of challenges regarding the behavioural and emotional regulation skills of the child along with the perceived increased emotional or physical demands that are placed on the parent. Shine and colleagues' revised PSI-SF subscales provide an increased level of specificity in identifying stressors and were able to tease apart parent-gender differences within the *Difficult Child* subscale to identify that the perceived parenting stress associated in this original subscale resulted in *Behavioural Regulation* as the same between mothers and fathers but with parent-gender differences within *Child Limits*. This difference between the items found for the original *Difficult Child* subscale would not have been identified without the increased specificity of Shine and colleagues' revised PSI-SF subscales.

However, this finding of higher maternal overall stress conflicts with a study conducted by Rivard et al. (2014), where 118 Canadian-Francophone mother-father dyads were examined, and it was found that fathers reported greater parental distress than mothers. These conflicting results may be due to the current study's sample having a more diverse representation of socioeconomic status, a larger sample size, as well as greater representation of female children compared to Rivard and colleagues' sample, which could impact our differences in findings. Although Rivard and colleagues (2014) did not examine coping constructs in their study, this difference between our results may be attributed to the mothers in our sample reported having more social support from religion/spirituality as well as friends and family to rely on than fathers (although not a significant difference), which can aid in buffering against the negative impacts of stress and distress (Altiere & von Kluge, 2009; Enea & Rusu, 2020; Kuan et al., 2022).

Additionally, our finding regarding greater maternal reports of perceived stress relating to challenging behaviours also conflicts with Rivard et al. (2014), where it was found that Canadian-Francophone fathers scored higher in the *Difficult Child* domain compared to mothers.

However, this conflicting result may be related to how the proposed subscales by Shine (2021) shed light on the specific areas of challenging behaviours that mothers perceive to be stressful compared to fathers, compared to conceptualizing it more broadly with the *Difficult Child* or *Dysfunctional Parent-Child Interaction* subscales by Abidin (1995). This increased specificity may explain the difference between our findings with Rivard et al. (2014), as various child behaviours may predict stress and distress differentially between mothers and fathers (Allen et al., 2013; Flippin & Crais, 2011; McStay et al., 2014).

Along with the interaction effect between parent gender and subscale type for the PSI-SF, an additional interaction effect between parent gender * child sex * subscale type was only significant when examined using Shine and colleagues' (2022) revised subscales. We found that fathers of female children reported experiencing lower stress regarding behavioural challenges associated with *Child Limits*, when compared to mothers of female children. This finding is quite novel in the literature and may be a result of the more psychometrically suitable factor analytically subscales of the PSI-SF, leading to greater sensitivity for understanding parenting stress for this population of families of children with ASD. Moreover, these findings extend the literature regarding patterns of parenting stress between parent-gender and child-sex from Rivard and colleagues (2014), where they found that fathers with female children reported higher scores on the *Parental Distress* subscale than fathers with male children. Both the current study and Rivard et al.'s (2014) study point towards the different childrearing experiences with fathers of female children with ASD, and further highlight the importance of representation of fathers and female children in research surrounding family stress experiences, as they are distinct from mothers of male children, who are often overrepresented in the literature (Johnson & Simpson, 2013; Rankin et al., 2019).

Furthermore, it was found that child sex was only significant when considered within a joint interaction with parent gender and subscale type, as opposed to child sex * subscale type. This suggests that generally, child sex may not impact mothers' and fathers' perceptions and experiences of stress when considered on its own. Moreover, there were reported differences in stress between parent genders for male or female children (e.g., between mothers and fathers of female children). This novel finding suggests that for parents of the same child, mothers and fathers experience stress differently depending on the child's sex. Specifically, the current study found that mothers of male children had higher ratings of stress across many new subscales of the PSI-SF when compared with fathers of male children, and mothers also reported greater stress related to *Child Limits* for female children than fathers. This may be due to mothers' perceptions of stress differing from fathers when examining specific child characteristics associated with maternal and paternal distress. For example, the dyadic studies conducted by Allen et al. (2013) and Li et al. (2022) found that lower child communication and sociability skills predicted stress for mothers, whereas only child cognitive and sensory challenges predicted stress for fathers. Our findings align with these studies as we found that mothers had higher ratings of stress relating to interacting with their child through the *Perceived Disagreeable Behaviour* subscale, suggesting that the child communication skills and oppositional behaviours impacting the negative parent-child interactions resulted in greater distress for mothers when compared to fathers.

In addition, our finding that there were no child sex differences within parent gender (e.g., no differences in stress ratings between mothers of male children and mothers of female children) may be influenced by sex differences in ASD characteristics. Although female children tend to have less severe ASD compared to males (Ratto et al., 2018), and more severe ASD

characteristics, such as social communication impairments, are associated with increased parental stress (Allen et al., 2013; Davis & Carter, 2008), the children in our sample had an average CARS score of $M = 33.56$, $SD = 2.82$, which falls within the mild to moderate ASD range. Additionally, the CARS scores between male and female children in the sample did not significantly differ. Although detailed information regarding severity across the domains of ASD characteristics was not available for the present study, the milder and similar ASD severity scores for males and females may explain the lack of child sex differences in mothers' ratings of stress.

For the F-COPES, we did not find main effects or interaction effects when examining parent-gender and/or child-sex differences in parent coping. Although the difference was not significant, mothers in our sample reported having a larger network of social supports from friends, family, and spirituality for mothers compared to fathers. This aligns with the findings of Altiere and von Kluge (2009), where mothers had higher scores in the *Acquiring Social Support* domain on the F-COPES, and this may explain gender differences in *Parental Distress* found in the PSI-SF, as the use of social supports is a significant predictor of lower maternal distress (Pozo & Sarria, 2014). Our lack of findings regarding parent-gender differences also aid in clarifying mixed findings in the literature, as other studies have also found no differences between mothers and fathers regarding their overall coping experiences according to the F-COPES (Dabrowska & Pisula, 2010; McStay et al., 2014; Pozo & Sarria, 2014). However, this also suggests the F-COPES may lack the specificity and sensitivity needed to conceptualize the coping experiences for families of children with ASD, and a measure of parent coping developed or normed for parents of children with ASD may provide greater utility in identifying parent-gender and/or child-sex differences.

These findings also highlight the potential of lower or higher maternal stress relating to the appraisal of stressors as a threat or challenge. As there were no parent-gender differences in coping, similar coping strategies and usage between mothers and fathers may have led to higher perceived maternal stress in child maladaptive behaviour subscales on the PSI-SF. This coincides with research suggesting that child characteristics predict greater stress for mothers than fathers when considering that mothers tend to appraise stressors as more threatening (Kaniel & Siman-Tov, 2011). If the mothers in our sample reported a greater use of coping, perhaps their stress would be lower or equal to fathers regardless of child sex. This suggests that a potential resilience factor for maternal parenting distress may be associated with greater coping usage than fathers.

Limitations & Future Research

Although the current study examined a large and demographically diverse community sample of mother-father dyads, many limitations should be noted. First, while our decision to use mother-father dyads controlled for child-related confounds, these results may not be representative of those in diverse family constellations. Second, the proposed subscales by Shine and colleagues (2022) utilize fewer questionnaire items per domain, in most cases, which led to some lower reliabilities compared to the original subscales. Third, effect sizes were small for all significant differences found. Fourth, data were collected over a wide timeframe, between 2006 and 2016, and gender expectations of parenting may have shifted within that decade and after the COVID-19 pandemic. Fifth, there were limited direct cross-comparisons between parent-gender and child sex (e.g., directly between mothers of male children and fathers of female children), and cross-sectional analyses were conducted without examining differential predictors of stress and coping between mothers and fathers of female and male children. Thus, our limited inclusion

of factors related to the Perry Model of Stress such as parenting style, level of involvement, social supports, cultural influences, or family variables, which have been found to impact stress and coping (e.g., Ni'matuzahroh et al., 2022; Robinson & Weiss, 2020; Shepherd et al., 2018), hinders our holistic conceptualization of parent-gender and child-sex interactive differences. Finally, parents' perceptions of their stress and coping were only collected shortly after their child received a diagnosis and was about to begin a behavioural intervention program. As previous research has shown that experiences of parenting stress and coping may evolve over time and bi-directionally interact with child characteristics and ASD symptoms (Rodriguez et al., 2019), our results do not represent families' experiences as they adapt and change throughout their caregiving and childrearing journeys.

Future studies should continue examining parental distress and coping while being mindful of cultural influences on parenting, as well as including parents from non-traditional family systems. As previous research indicated that differences may exist between mothers' and fathers' experiences, it is important to continue broadening our understanding of these differences with a more nuanced view to fully conceptualize their parenting challenges and strengths. Furthermore, other commonly used measures of distress or coping should be re-conceptualized to explore psychometric properties in this population, and additional regression analyses that account for a wider range of stressors, resources, and supports as outlined by the Perry Model of Stress, should be conducted to extend the results of the current study. Possible psychometric revisions to existing measures administered to this population of families of children with ASD will promote more accurate and sensitive psychological interventions and research. Moreover, through greater explorations of how parent-child relationships and parent-child interactions are influenced by various factors, researchers and clinicians will be able to

further understand children's social-emotional development and well-being. Future studies conducting longitudinal qualitative research along with quantitative regression or latent class analyses will allow researchers to better understand the intricacies of parenting stress and coping over time while exploring differences between parent-gender and/or child-sex in order to identify areas of challenges and strengths for parents. As the current study found an interaction between parent gender * child sex * subscale type for the PSI-SF, this suggests that sex differences in child characteristics may also play a role in how some aspects of stress are experienced in families, and future research can further explore genetic, environmental, and neurobiological contributors to challenging behaviours aligning with the *Child Limits* subscale.

Clinical Implications

Despite the potential limitations regarding reliability estimates with Shine et al.'s (2022) factor structures in future research, the increased specificity of the proposed subscales regarding challenging behaviours may be more beneficial clinically. With more specific information using the proposed subscales, clinicians can more accurately identify areas of improvement regarding parental distress and coping for mothers and fathers of female or male children. These revised subscales should be used along with the Perry Model of Stress (2004) in order to holistically conceptualize areas of stressors, resources, and supports required to best address families' needs. Furthermore, the quality of support from clinicians may be more important for parenting stress reduction as opposed to the number of accessible or received resources and supports. With improvements to support programs and psychological interventions directed by more psychometrically sensitive measures, clinicians and policymakers can better aim to decrease parenting stress and improve positive coping skills or resilience, where both parents and children with ASD will benefit from healthier family relationships and mental health.

Through examining differences in stress and coping, both struggles and areas of resilience were suggested by the current study. For example, clinicians can intervene and reduce the impact of risk factors, such as threat appraisal, through buffering and strengthening maternal coping. Furthermore, clinicians working with specific parent genders can target coping relating to specific child characteristics or ASD symptoms, such as challenging behaviours falling under the *Child Limits* subscale. This will aid clinicians and policymakers to consider and pinpoint specific stressors that parents of certain characteristics may tend to experience, and will inform how future support and educational programs should be tailored for parents of children with ASD in particular. More specifically, when considering the use of parent-mediated interventions, it will be important for clinicians to consider the effectiveness of parent implementation through the consideration of specific child characteristics and coping strategies that may be more likely to be stressful and impede intervention outcomes. For example, parent-administered interventions targeting areas related to *Behavioural Regulation* or *Child Limits* will hopefully result in improvements in these child characteristics, leading to potential decreases in parenting stress as these areas are associated with greater stress outcomes. Parent-implemented interventions that aim to improve interactions between parents and children may also re-frame how parents appraise *Perceived Disagreeable Behaviours* and specific interactions regarding *Reciprocity*, leading to a strengthened bi-directional parent-child relationship through more positive interactions and decreased parenting stress, as suggested through the theoretical framework proposed by Sameroff's (2009) transactional model. Thus, researchers, clinicians, and policymakers interested in promoting parent-mediated interventions should also consider both child and parent-related outcomes.

Conclusion

In summary, our study highlighted that parental distress and coping may be experienced somewhat differently between mothers and fathers of female or male children with ASD. Additionally, our study demonstrated that although there are strengths to examining the PSI-SF and F-COPES in parents of children with ASD using the factor structures as published by their authors (Abidin, 1995; McCubbin et al., 1991), there may be more clinical advantages of using the proposed factor structures by Shine and colleagues (2022) in the future for these measures. Furthering our understanding of gender differences and influences of child sex in parenting experiences will allow clinicians to target specific areas of support for mothers and fathers, as well as better support their parenting needs and family well-being.

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