Like Mother, Like Son: A Similarity-Fit Perspective on Motherhood and the Broader Autism Phenotype

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Abstract

Background: The broader autism phenotype (BAP) has emerged as a promising construct in the study of autism spectrum disorder (ASD). Given that this pattern of subclinical ASD characteristics is commonly found in parents of children with ASD, it seems critical that parenting research with ASD populations acknowledge the likely interaction between parent and child traits. Unfortunately, little research has explored the interaction between childhood ASD, maternal BAP, and parenting outcomes. The present study helps to address this gap by investigating these relationships through the lens of the similarity-fit hypothesis, which was first established in the attention-deficit/hyperactivity disorder (ADHD) literature. Under this framework, overlap between parent and child traits is thought to promote a "fit" within the parent-child relationship. **Methods:** A sample of 143 North American mothers of boys (with and without ASD) participated in a large online survey incorporating measures of the BAP, ASD, ADHD, and parenting variables (i.e., positive/involved parenting, negative parenting, parenting stress). Moderation analyses were conducted to examine the relationship between maternal BAP, child ASD, and parenting outcomes. Given previous support for similarity-fit in ADHD populations, post-hoc moderation analyses were conducted to examine the interaction between maternal ADHD, child ADHD, and parenting outcomes. **Results:** The regression analyses revealed no significant interaction effects between maternal BAP, child ASD, and each dependent variable. Instead, both mother and child ASD/BAP traits corresponded with increased parenting stress, suggesting the possibility of an additive impact. Conversely, parenting practices were related to maternal BAP traits but not child ASD symptomology. Greater maternal BAP ratings were linked to poorer parenting practices. Paralleling past similarity-fit research, post-hoc analyses revealed significant interaction effects for mother and child ADHD symptomology and

parenting outcomes. Greater maternal ADHD symptomology predicted significantly more negative parenting and parenting stress, but only for mothers of children without ADHD. **Conclusions:** Contrary to the similarity-fit hypothesis, child ASD did not moderate the relationship between BAP characteristics and parenting outcomes. Conversely, results supported ADHD similarity-fit within the present sample. These findings suggest that 'fit' between mother and child is important for promoting positive parenting outcomes within the context of ADHD symptomology but not ASD/BAP characteristics.

Keywords: autism spectrum disorder, attention-deficit/hyperactivity disorder, broader autism phenotype, mother, parent-child

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Table of Contents

Abstract ... 2
Acknowledgments ... 4
Table of Contents ... 5
List of Tables ... 7
List of Figures ... 8
Preface ... 10
Chapter 1: Literature Review ... 16
The Historical Context of Parenting and ASD ... 17
The Broader Autism Phenotype ... 22
Transactional Perspectives on Development ... 25
Similarity-Fit and The Broader Autism Phenotype ... 29
Chapter 2: The Current Study ... 38
Parenting Behaviours ... 39
Parenting Stress ... 41
Research Questions ... 43
Chapter 3: Method ... 46
Participants ... 46
Measures ... 48
Procedures ... 56
Chapter 4: Results ... 58
Data Preparation ... 58
Sample Characteristics ... 62
Descriptive Statistics ... 66
Correlational Analyses ... 68
Moderation Analyses ... 71
Post-Hoc Analyses ... 108
Chapter 5: Discussion ... 130
Relationships Between Variables ... 130
Similarity-Fit Findings ... 140

Satisfaction with Support 145
Study Strengths 147
Study Limitations 149
Implications 154
Future Directions 162
Conclusions 163
References 165
Appendix A: Recruitment Materials 195
Appendix B: Demographic Questionnaire 200
Appendix C: Suvey Measures and Time Commitment 206
Appendix D: Consent Form 207
Appendix E: Debriefing Information 209
Appendix F: Survey Infographic Results Summary 210
Appendix G: Assumptions Testing 211
Appendix H: Variance Inflation Factor 229
Appendix I: ASD/BAP Moderation Analyses Without Covariates 233

List of Tables

Table 1: Location of Residence 62
Table 2: Sample Characteristics 64
Table 3: Descriptive Statistics 66
Table 4: Correlation Matrix 70
Table 5: Research Question 1 – Rigidity & Positive and Involved Parenting 73
Table 6: Research Question 2 – Aloofness & Positive and Involved Parenting 76
Table 7: Research Question 3 – Pragmatic Language Difficulties & Positive and Involved Parenting 79
Table 8: Research Question 4 – Total BAP & Positive and Involved Parenting 82
Table 9: Research Question 5 – Rigidity & Negative Parenting Practices 85
Table 10: Research Question 6 – Aloofness & Negative Parenting Practices 88
Table 11: Research Question 7 – Pragmatic Language Difficulties & Negative Parenting Practices 91
Table 12: Research Question 8 – Total BAP & Negative Parenting Practices 94
Table 13: Research Question 9 – Rigidity & Parenting Stress 97
Table 14: Research Question 10 – Aloofness & Parenting Stress 100
Table 15: Research Question 11 – Pragmatic Language Difficulties & Parenting Stress 103
Table 16: Research Question 12 – Total BAP & Parenting Stress 106
Table 17: ADHD Similarity-Fit – Positive and Involved Parenting 111
Table 18: ADHD Similarity-Fit – Negative Parenting Practices 114
Table 19: ADHD Similarity-Fit – Parenting Stress 117
Table 20: ADHD Similarity-Fit in ASD Sample – Positive and Involved Parenting 120
Table 21: ADHD Similarity-Fit in ASD Sample – Negative Parenting Practices 122
Table 22: ADHD Similarity-Fit in ASD Sample – Parenting Stress 124
Table 23: Correlations with Support Satisfaction 129

List of Figures

Figure 1: Moderation Model 1 – Conceptual Diagram 72
Figure 2: Research Question 1 – Statistical Diagram 74
Figure 3: Research Question 1 – Graph with Fit Line 75
Figure 4: Research Question 2 – Statistical Diagram 77
Figure 5: Research Question 2 – Graph with Fit Line 78
Figure 6: Research Question 3 – Statistical Diagram 80
Figure 7: Research Question 3 – Graph with Fit Line 81
Figure 8: Research Question 4 – Statistical Diagram 83
Figure 9: Research Question 4 – Graph with Fit Line 84
Figure 10: Research Question 5 – Statistical Diagram 86
Figure 11: Research Question 5 – Graph with Fit Line 87
Figure 12: Research Question 6 – Statistical Diagram 89
Figure 13: Research Question 6 – Graph with Fit Line 90
Figure 14: Research Question 7 – Statistical Diagram 92
Figure 15: Research Question 7 – Graph with Fit Line 93
Figure 16: Research Question 8 – Statistical Diagram 95
Figure 17: Research Question 8 – Graph with Fit Line 96
Figure 18: Research Question 9 – Statistical Diagram 98
Figure 19: Research Question 9 – Graph with Fit Line 99
Figure 20: Research Question 10 – Statistical Diagram 101
Figure 21: Research Question 10 – Graph with Fit Line 102
Figure 22: Research Question 11 – Statistical Diagram 104
Figure 23: Research Question 11 – Graph with Fit Line 105
Figure 24: Research Question 12 – Statistical Diagram 107
Figure 25: Research Question 12 – Graph with Fit Line 108
Figure 26: Moderation Model 1 – Conceptual Diagran for ADHD 110
Figure 27: ADHD Similarity-Fit – Positive/Involved Parenting Statistical Diagram 112
Figure 28: ADHD Similarity-Fit – Positive/Involved Parenting Graph with Fit Line 113
Figure 29: ADHD Similarity-Fit – Negative Parenting Statistical Diagram 115
Figure 30: ADHD Similarity-Fit – Negative Parenting Graph with Fit Line 116

Figure 31: ADHD Similarity-Fit – Parenting Stress Statistical Diagram..... 118
Figure 32: ADHD Similarity-Fit – Parenting Stress Graph with Fit Line..... 119
Figure 33: ADHD Similarity-Fit in ASD Sample – Positive/Involved Parenting Statistical Diagram..... 121
Figure 34: ADHD Similarity-Fit in ASD Sample – Positive/Involved Parenting Graph with Fit Line..... 122
Figure 35: ADHD Similarity-Fit in ASD Sample –Negative Parenting Practices Statistical Diagram..... 123
Figure 36: ADHD Similarity-Fit in ASD Sample – Negative Parenting Practices Graph with Fit Line..... 124
Figure 37: ADHD Similarity-Fit in ASD Sample – Parenting Stress Statistical Diagram..... 125
Figure 38: ADHD Similarity-Fit in ASD Sample – Parenting Stress Graph with Fit Line..... 126

Like Mother, Like Son: A Similarity-Fit Perspective on Motherhood and the Broader Autism Phenotype

Preface

For several decades, autism spectrum disorder (ASD) has been a subject of interest for researchers and practitioners across social, developmental, psychological, and medical fields. More recently, it has risen to the attention of the general population through trending media coverage and a persistently growing incidence rate that has been established on a global scale. A recent report from the Public Health Agency of Canada (2018) identified that 1 in every 66 Canadian children and youth has ASD. Similarly, current estimates from North America, Asia, and Europe suggest that ASD can be found in nearly 1-2% of the population (American Psychiatric Association [APA], 2013; Centers for Disease Control and Prevention [CDC], 2016). This rate has risen considerably from the 1990s, when estimates suggested that only 1 in 150 children had an ASD diagnosis (CDC, 2016). Proposed explanations for these rising diagnostic rates suggest a variety of possible factors including ever-changing diagnostic practices and conceptualizations, increased awareness, and actual increases in the incidence of ASD (APA, 2013; Tsai, 2014).

Whether due to altering conceptualizations or tangible increases, the reality of a rising worldwide prevalence rate is that many modern families—regardless of race, culture, or socioeconomic status—are directly impacted. The impact may be particularly salient for mothers of children with ASD, who report greater levels of domestic responsibility and unmet support needs than fathers of children with ASD (Gray, 2003; Hartley et al., 2014; Hartley & Shucltz, 2015; Teehee et al., 2009). This finding aligns with general parenting norms, where mothers—even more so historically, but still at present—tend to assume greater responsibility for

household and caregiving needs within the family system (Horne et al., 2018; Yavorsky et al., 2015).

Given the central role of mothers within the family unit, it seems unsurprising that investigations involving families of children with ASD have commonly explored the dynamics between children with ASD and their mothers (Jack, 2014). Research suggests that parents (primarily mothers) of children with ASD report poorer family cohesion, increased marital strain, and poorer parenting outcomes than parents of typically developing children (Chang et al., 2019; Higgins et al., 2005; McRae et al., 2018; 2019); though these relationships have not consistently been supported (Lambrechts et al., 2011; Maljaars et al., 2014; van Steijn et al., 2015). This discrepancy may stem, at least in part, from varied approaches to measuring family and parenting outcomes. Greater consensus seems to have been reached regarding mental health outcomes, where parents of children with ASD have reported higher levels of parenting stress, psychological distress, and physical/emotional exhaustion in comparison to parents of typically developing children (Giallo et al., 2011; Hayes & Watson, 2013; Hodge et al., 2011; Keenan et al., 2016; Kiami & Goodgold, 2017; Sawyer et al., 2010). In research that has specifically compared maternal and paternal experiences, mothers of children with ASD have reported greater levels of somatization, anxiety, depressive symptomology, and parenting stress compared to fathers of children with ASD (Dabrowska & Pisula, 2010; Gray, 2003; Hodge et al., 2011; Teehee et al., 2009; van Steijn et al., 2014).

Despite growing interest in the parenting experiences of mothers of children with ASD, research rarely considers the likely presence of maternal autism characteristics in this parent-child dynamic and very little is known about the experiences of mothers *with* ASD (van Steijn et al., 2013a). This oversight is highly concerning, given that ASD diagnostic rates are higher in

parents of children with ASD than in parents of children without ASD (Lau et al., 2016). Moreover, even in the absence of clinical impairment, parents of children with ASD are more likely to demonstrate subthreshold ASD-like characteristics—called the broader autism phenotype (BAP)—than parents of children without ASD (Bolten et al., 1994; Losh et al., 2011; Maxwell et al., 2013). The BAP involves patterns of behaviour that are qualitatively similar to those seen in ASD, including restricted behaviours and social/communication deficits. Estimates suggest that approximately 9–23% of mothers and 9–40% of fathers of children with ASD report patterns of behaviour consistent with the BAP—compared to approximately 4–9% of parents of typically developing children (Maxwell et al., 2013; Sasson et al., 2013a). Given the high probability of parental BAP, it seems fundamentally important that any exploration of parenting dynamics in ASD populations consider the likely interaction between parent and child characteristics; yet, this is a gap that continues to persist in the literature.

The BAP is a relatively novel concept within the ASD literature, which may offer context to why gaps persist in relation to parenting outcomes. Yet very little research has explored the interaction between parenting and parental ASD, which is not a new phenomenon. The lack of research in the study of parenting and ASD may relate to persisting societal perspectives that generally intertwine depictions of disability with those of childhood (Robey et al., 2006). This stereotype of the "eternal child" is especially pervasive in the ASD community, where the infantilization of autism has been perpetuated by media, advocacy groups, researchers, parents, and family members (Stevenson et al., 2011). Strictly speaking, the dominant portrayal of autism is that of a young boy—which suggests to the public that youth and masculinity are not just more common, but actually inherent to ASD (Jack, 2014; Murray, 2008). It is conceivable that the limited research involving parents with ASD—and possibly by extension, the BAP—stems, at

least in part, from this societal tendency towards viewing ASD as a disability bound to childhood; thus, making people less likely to consider issues relating to the intersection of ASD and parenting, particularly for mothers.

For mothers specifically, exploration of ASD characteristics has likely been further hindered by the general nature of the ASD literature, where girls and women are often underrepresented or ignored altogether (Hsiao et al., 2013; Van Wijngaarden-Cremers et al., 2014). This male-oriented bias corresponds with a discrepant diagnostic gender ratio. Current estimates suggest that approximately three males receive an ASD diagnosis for every female who is diagnosed (Loomes et al., 2017). While no conclusive explanations have been drawn, the origins and perpetuation of this gender discrepancy have been attributed to (a) possible differences in diagnostic presentation across genders; (b) potential bias in ASD diagnostic criteria that is largely grounded in work with male samples; (c) the possibility that females are better able to mask or compensate for deficits; as well as (d) actual genetic differences between genders (APA, 2013; Mandy et al., 2012; Rivet & Matson, 2011; Skuse, 2007). Among those girls who receive a diagnosis, researchers have found higher rates of concurrent cognitive impairment than in boys with ASD (Dworzynski et al., 2012). Collectively, these factors narrow the potential participant pool and make it particularly challenging to conduct research with 'high functioning' women with ASD, including mothers. As such, research efforts involving adults with ASD are likely to favor male recruitment, thus creating an additional barrier to studying the unique experiences of mothers with ASD traits.

While gaps in the literature have persisted, the reality is that autism characteristics are not limited to boys and men, nor are they limited to childhood. Mothers with ASD or BAP characteristics may face distinct challenges and may offer unique strengths to the role of

parenting, yet this area is largely underexplored. Some recent studies have acknowledged this as a limitation to their research (e.g., Chang et al., 2019; Pisula & Porębowicz-Dörsmann, 2017), yet many studies in this area continue to overlook the contributions of the BAP altogether (e.g., Giallo et al., 2011; Keenan et al., 2016; Larson, 2006). In fact, much of the literature seems to presume that parents of children with ASD are typically functioning—rarely assessing for ASD and BAP characteristics despite well-established higher rates in parents of children with ASD (Bolten et al., 1994; Crowell et al., 2019; Lau et al., 2016; Losh et al., 2011; Maxwell et al., 2013).

Fortunately, a few studies have started to explore motherhood and ASD; though findings are inconsistent. Some research has highlighted negative impacts of maternal ASD (van Steijn et al., 2015), while other research has found little to no impact (van Steijn et al., 2013a; van Steijn et al., 2013b). Still other research has suggested that maternal ASD may not be associated with negative parental outcomes and may actually result in increased parental success and stronger parenting efficacy, although further research is needed to test this theory (Lau et al., 2016). Accordingly, mothers with autism spectrum conditions have qualitatively reported experiencing *both* strengths and challenges in their parenting role as a result of their symptomology (Winnard et al., 2021). While literature is starting to emerge in this area, there is a tendency towards more neutral or deficit-focused perspectives on parental ASD that emphasize the potential challenges that can result from lower levels of empathy, difficulty with give-and-take interactions, poor perspective taking, and excessive rigidity and need for control (e.g., Jennings, 2005; van Steijn et al., 2013a). Certainly, it is important to acknowledge the barriers that are faced by parents with ASD and BAP traits, yet there is also value in considering ASD and BAP-specific strengths (e.g.,

structure, consistency) that could contribute to the parenting role—particularly when parenting children with ASD. The present study is well positioned to undertake this objective.

In an effort to address persisting gaps in the literature, this dissertation explored the interaction between motherhood and BAP characteristics from a transactional lens that considers the bidirectional relationship between mother and child. More specifically, this research was guided by the similarity-fit hypothesis, a strength-based approach to exploring parenting outcomes based on the "fit" between maternal BAP traits and child ASD symptomology. This hypothesis has been previously established within attention-deficit/hyperactivity disorder (ADHD) populations, where greater maternal ADHD symptomology has been found to correspond with more positive parenting outcomes (Psychogiou et al., 2008), as well as buffering of the negative effects of child ADHD on parenting (Psychogiou et al., 2007; Johnston et al., 2016). Extending beyond the ADHD literature, the similarity-fit hypothesis offers a useful framework for conceptualizing the dynamics between parenting and ASD.

Within the present study, the similarity-fit hypothesis guided exploration of the relationship between the BAP and maternal parenting experiences and practices. Primarily, this research sought to investigate whether higher levels of maternal BAP characteristics correspond with more positive parenting outcomes (i.e., parent related practices and stress) for mothers of sons with ASD. To accomplish this objective, mothers were recruited from across North America to participate in an online survey. Survey measures and questions were carefully selected to address the primary objectives of this study.

Chapter 1: Literature Review

At present, autism is conceptualized along a spectrum that recognizes variability in symptom severity and developmental trajectories within the diagnosis (APA, 2013). Under this framework, recent diagnostic guidelines have advocated for grouping several former neurodevelopmental diagnoses (i.e., autistic disorder, Asperger's syndrome, and pervasive developmental disorder not otherwise specified) under one diagnostic label (APA, 2013). Collectively, these diagnoses are conceptualized as ASD, which ranges from lower to higher levels of functioning and recognizes extensive variability in symptom presentation.

Despite considerable variability, ASD symptom presentations are unified through several core features. ASD is a neurodevelopmental disorder that results in deficits in social interaction and communication as well as repetitive behaviour patterns and interests that impact daily functioning (APA, 2013). Compared to neurotypical populations, individuals with ASD demonstrate greater rigidity, adherence to rules and routines (APA, 2013), interpersonal challenges (APA, 2013; Chamberlain et al., 2007; Mazurek & Kanne, 2010; Orsmond et al., 2004), and difficulty with the pragmatic or social use of language (Baixauli-Fortea et al., 2017; Larkin et al., 2017). ASD also involves social-emotional deficits, including difficulties with interpreting social cues (Attwood, 2000; Koning & Magill-Evans, 2001), following social conventions (APA, 2013; Tantam, 1991; Williams, 1995), empathizing (Baron-Cohen & Wheelwright, 2004), and identifying, describing, and regulating emotions (see Mazefsky et al., 2013; Samson et al., 2012). While these difficulties first present in childhood, they have been found to continue across the lifespan (Murray, 2008), making it imperative to consider how these challenges impact roles and responsibilities that arise in adulthood. In particular, we must consider how the unique pattern of social, emotional, and behavioural challenges associated with

ASD—both in terms of clinical and subclinical characteristics—interact with the role of parenting.

Interest in the relationship between parenting and ASD is not a new phenomenon. In fact, discussions on this issue can be traced back to some of the first conversations in the field (e.g., Asperger, 1944, Kanner, 1949). Most notably, early perspectives prompted an ongoing dialogue regarding the contributions of biology and environment to the development of ASD. Extensive research has explored this issue since the introduction of autism as a diagnostic concept, and while knowledge regarding the etiology of autism has significantly advanced, the precise contributions of nature and nurture have yet to be definitively established.

The Historical Context of Parenting and ASD

Conceptualizations of ASD have historically fluctuated like a pendulum, starkly shifting between two opposing theoretical positions and stimulating the age-old debate of nature versus nurture. Perspectives on this issue have continued to evolve over many decades, not only influencing clinical and societal perspectives on individuals with ASD, but also on *parents* of individuals with ASD—who have received attention from both sides of the argument. The following discussion synthesizes these evolving perspectives, particularly as they relate to parenting and ASD.

Early Support for Nature

Some of the earliest observations documented by Leo Kanner and Hans Asperger—pioneers in the field of autism research—supported a genetic understanding of ASD (Asperger, 1944; Kanner, 1944). These historical accounts speak to the heritable nature of autism by mapping a trans-historical record of "autism's essence" across generations (Verhoeff, 2013). For example, in his seminal paper, Asperger (1944) described observing similar characteristics,

personality features, and patterns of intelligence in family members—particularly fathers—of children with autism. In documenting his work with children with autism, Kanner (1954; republished in 1973) also acknowledged the "resemblance between [parent's] make-up and that of their children," noting that "one is tempted to think of them as successfully autistic adults" (p. 74). While both Kanner and Asperger initiated a conversation around genetic heritability in ASD families, these insights failed to gain traction in research or clinical communities, as they stood in contrast to the prevailing Freudian perspectives of this era (Chown & Hughes, 2016; Greydanus & Toledo-Pereyra, 2012). Instead, interpretations of familial characteristics and subclinical traits veered extensively away from a nature-based dialogue and the contributions of nurture entered the ASD debate.

The Psychoanalytic Influence

Though Kanner acknowledged the potential role of genetics, he also became influenced by the wide-spread psychoanalytic beliefs of the time (Kanner 1949; 1973). Under the psychoanalytic framework, Kanner proposed what has notoriously become one of his most detrimental hypotheses surrounding autism—that autism is a product of cold, detached parenting (Kanner, 1973). When documenting his perceptions of parents of children with ASD, he depicted them as coldhearted and disinterested in others. Most infamously, Kanner's work inspired the phrase 'refrigerator mother,' as he once stated that childhood autism results, at least in part, from "parental coldness, obsessiveness, and a mechanical type of attention to material needs only.... [these children] were kept neatly in refrigerators which did not defrost" (Kanner, 1949, p. 425). Although Kanner also acknowledged that parental relations fail to account for the full picture—as the early onset of symptoms suggests a possible genetic contribution (Kanner, 1944)—his

nurture-based hypotheses gained momentum within the field and inspired even more radical perspectives regarding the influence of parents.

For example, over a decade after Kanner first discussed parent-child likeness in autism, Leon Eisenberg explored similar patterns of behaviour in fathers of children with autism. He described the fathers as "obsessive, detached, and humorless…perfectionistic to an extreme…[and] pre-occupied with detailed minutiae to the exclusion of concern for over-all meanings" (Eisenberg, 1957, p.721). In his descriptions, Eisenberg portrayed these men as inadequate husbands and fathers, who demand conformity from their child and who view the child's detachment as an asset. Though he did not explicitly link the cause of autism to paternal treatment, he noted that the "personality difficulties" of these fathers impaired their ability to fulfill their paternal role and were severely detrimental to the functioning of their families. This dismal deficit-based perspective highlights Eisenberg's attempt to make sense of the overlap in characteristics between children with autism and their fathers. Even more radical were the discussions that followed the discourse of Kanner and Eisenberg.

Bruno Bettelheim—an Austrian-born American philosopher—is notoriously recognized for drastically twisting Kanner's perspectives to propagate the refrigerator mother theory (Baker, 2010; Greydanus & Toledo-Pereyra, 2012). Influenced by Freudian ideology and using Kanner's work to bolster his argument, Bettelheim popularized this parent-blaming ASD hypothesis in the United States through his book *The Empty Fortress* (1967). In his writings, Bettelheim asserted that autism develops from the neglect and cruelty of mothers who withhold affection from their children (Baker, 2010; Bettelheim, 1967; Losh et al., 2011). He compared mothers of children with ASD to controlling Nazi prison guards and advocated for the removal of these children from the care of their parents (Bettelheim, 1967; Cohmer, 2014; Mesibov et al., 2000). Despite

having no psychological or medical training, Bettelheim's work left a dark legacy on the field, as families of children with ASD became riddled with guilt, struggled through increased tension and conflict, and became wary of the perspectives of clinical and medical authorities (Baker, 2010; Holaday, 2012; Mesibov et al., 2000; Wing, 1997).

Returning to a Genetic Perspective

Bernard Rimland, an American psychologist and founder of the Autism Society of America, took a significant stance against Bettelheim's prevailing views (Cohmer, 2014; Rimland, 1964). In a time where popular opinion maintained the refrigerator mother theory of autism, Rimland stressed that neurological factors were the true cause of autism. He also contended that psychoanalytic causal theories of autism that place blame on parents are harmful for the welfare of the child, as they incite guilt, shame, and family discord. He published his views in 1964, in a novel that contained a forward by Leo Kanner. Kanner described his own transforming perspective, moving away from the role of mothers and towards a neurological understanding of autism (Rimland, 1964). With this publication, Rimland's monologue became the spark that directed research and practice in a new direction, one that was routed in a neurological understanding.

To this day, research and theory in the field commonly lean toward a biological understanding of ASD that includes an emphasis on neurodevelopment and family transmission of traits through genetics—more so than relationships. Certainly, the research supports a neurodevelopmental understanding of ASD, but it seems shortsighted to completely disregard the influence of relational factors in this picture—particularly given that social communication and interaction deficits are core features underlying the diagnosis (APA, 2013; Crittenden et al., 2014). This reluctance to explore relational factors likely stems from the history of the field,

where parent-blaming refrigerator-mother theories have made it more challenging for modern researchers to navigate the sensitivities of parenting issues in ASD populations (Crowell et al., 2019). While it is absolutely important to acknowledge this history and avoid further damaging of relationships within the ASD community, it is possible to sensitively navigate relational research in a way that recognizes the unique contributions of both nature and nurture in the development of psychopathology.

Supporting the existence of an interaction between nature and nurture, research has found that harmful relational factors (e.g., extreme neglect, institutional deprivation) can significantly alter child development across cognitive, social, emotional, behavioural, psychological, and neurobiological domains (Van Ijzendoorn et al., 2011; Verhulst, 2017). At its most extreme, research with children who have experienced severe long-term neglect or institutional deprivation—often children adopted from Romanian orphanages—has found heightened rates of autism symptomology in this population (Rutter et al., 2010; Sonuga-Barke et al., 2017). At lesser extremes, some researchers have proposed that parent-infant mismatch, where a parent consistently struggles to interpret and respond to their infant's needs, could impact the attachment relationship, result in "impoverished input," and contribute to autism symptomology (Crittenden et al., 2014)—though more research is needed in this area to directly test this hypothesis. Other researchers have taken less severe stances, suggesting that parenting behaviour may not directly cause ASD, but could negatively impact neurodevelopment and exacerbate symptoms (Crowell et al., 2019). This stance acknowledges the transactional nature of the relationship between parents and children with ASD, where both parent and child difficulties are recognized for their bidirectional influence.

Incorporating a transactional perspective seems particularly important given that research suggests the frequent presence of subclinical ASD patterns in family members of individuals with ASD (Deisinger & Rotatori, 2015; Ingersoll & Wainer, 2014; Losh et al., 2011; Pickles et al., 2000). The research literature collectively refers to this presentation of milder personality and language characteristics as the *broader autism phenotype* (BAP). The BAP suggests a "strong probability of gene-environment interaction" (Crowell et al., 2019, p. 25); parents with higher BAP traits are more likely to have children with ASD, while also being more likely to demonstrate subclinical ASD characteristics of their own (Bolten et al., 1994; Losh et al., 2011; Maxwell et al., 2013)—which could impact their approach to parenting and subsequent child development outcomes. In exploring parent-child dynamics in ASD populations, it is absolutely necessary to consider the role of the BAP.

The Broader Autism Phenotype

Folstein and Rutter's (1977) formative twin research is often credited with providing the first wave of evidence for the role of heritability, genetics, and the BAP in ASD families (Ingersoll & Wainer, 2014; Losh et al., 2011). In their work with 21 same-sexed twin pairs (11 monozygotic [MZ] and 10 dizygotic [DZ]), Folstein and Rutter established an autism diagnostic concordance rate of 0% for the DZ pairs and 36% for the MZ pairs. This rate jumped to 10% for DZ twins and 82% for MZ twins when they looked at cognitive impairment (e.g., speech or language deficits, low IQ, and academic difficulties) among these pairs. From these findings, they established the importance of heritability and genetic factors in autism and concluded that "the hereditary influences are concerned with a variety of cognitive abnormalities and not just with autism" (Folstein & Rutter, 1977, p. 308). Not only was this study groundbreaking for the field of ASD research, it also amplified interest in the BAP. More specifically, this research

provided the first genetic evidence for a broader phenotype or milder variant of autism (based on cognitive and language characteristics) in family members of individuals with ASD (Losh et al., 2011).

Though it was not their initial objective, Folstein and Rutter's study propelled the field towards exploring an autism phenotype that exists below the diagnostic threshold of ASD. Influenced by Folstein and Rutter, Patrick Bolton et al. coined the term "broader phenotype" in their 1994 paper documenting their own research on the families of 99 individuals with autism (Bolten et al., 1994). Among the siblings of individuals with autism, they found that 12.4 to 20.4% (depending on phenotype definition stringency) demonstrated milder variations of autism symptomology, including repetitive behaviour patterns and social interaction and communication difficulties. This rate was significantly higher than in their comparison group, which consisted of siblings of individuals with Down syndrome. In drawing conclusions, they emphasized the genetic etiology of autism and characterized the broader phenotype as generally involving stereotypic behaviours and impairments in language, cognition, and social functioning. Since this time, research has continued to build a strong case for the existence of a broader autism phenotype, even when using contemporary diagnostic criteria (Deisinger & Rotatori, 2015; Ingersoll & Wainer, 2014; Losh et al., 2011; Pickles et al., 2000).

Collectively, the literature suggests that the BAP represents a phenotype of subclinical personality traits and behaviour patterns that align with those seen in ASD (Wainer, Ingersoll & Hopwood, 2011). It is important to note that the BAP itself is not a disorder and, by definition, does not involve clinically significant impairment in autism symptomology. Indeed, BAP features have not only been found in family members of individuals with ASD, but also continuously distributed throughout the general population (Wainer et al., 2011). Researchers

have generally studied the BAP by exploring characteristics associated with ASD, finding evidence for social impairment (e.g., Bolton et al., 1994; Losh & Piven, 2007; Wheelwright et al., 2010; Ruta et al., 2011); pragmatic language deficits (e.g., Bolton et al., 1994; Hurley et al., 2007; Whitehouse et al., 2007); and restricted and repetitive behaviour patterns (Bolton et al., 1994; Briskman et al., 2001; Losh et al., 2008; Murphy et al., 2000; Piven et al., 1997). Still, it should be noted that variability in study methodology, measurement, and theory has made it challenging to conclusively standardize a definition of the BAP (Deisinger & Roratori, 2015; Rubenstein & Chawla, 2018). For example, there is currently no universally recognized or gold standard approach for measuring the BAP (Ingersoll & Wainer, 2014).

Still, the BAP holds exciting promise as a construct and seems fundamentally important to current conceptualizations of ASD. Most relevant to the proposed study, the BAP offers a unique opportunity for exploring the link between ASD and parenting from a framework that recognizes the interacting contributions of both nature and nurture. Fit or misfit between parent and child characteristics—particularly in regard to autism symptomology—could have considerable influence on the parent-child relationship. At this point, one would be remiss to study the dynamics of parenting in ASD populations without acknowledging the very likely interaction between parent and child ASD/BAP traits. This perspective aligns with Sameroff and Chandler's (1975) argument that developmental outcomes and abnormalities cannot be attributed to nature *or* nurture, and instead must be recognized for the inseparable contributions of both (Sameroff & Mackenzie, 2003). It was through this lens that Sameroff and Chandler's (1975) Transactional Model of Development emerged.

Transactional Perspectives on Development

Transactional Model of Development

Sameroff and Chandler (1975) challenged the notion that child development could be understood by looking at biological or experiential explanations in isolation. Instead, they proposed that it is the dynamic reciprocal interaction between a child's biological nature (e.g., genes, neurodevelopment) and their environmental experiences (particularly in parent-child interactions) that determines their developmental outcomes. They believed "what is constant in a child's development was not a set of 'traits,' but the processes by which traits were maintained through the relationship between a child and his or her experience" (Sameroff & Mackenzie, 2003, p. 18). From this framework, it is understood that a child with the same genes can follow different paths of development based on the interactions of their biological predispositions and the experiences offered to them through their social environment (Sameroff, 2009). Moreover, just as parent interactions and behaviours can impact child outcomes, the child's interactions and behaviours can impact the parent's level of adjustment; thus, a transactional relationship emerges.

This model has been supported in families of children with ASD, with recent research suggesting that parental adjustment and behaviours (i.e., warm/supportive vs. harsh/disengaged parenting) are predictive of child internalizing and externalizing behaviours in children with ASD (McRae et al., 2019). Unfortunately, this research did not consider the potential (and likely) role of parental BAP characteristics within this interaction. Given that the transactional model accounts not only for the bidirectional nature of the parent-child relationship, but also for the contributions of genetics, it seems fundamentally important to consider BAP characteristics when researching parent-child dynamics in ASD families. This objective is further supported by

the "goodness of fit" model—proposed by Thomas and Chess (1977)—which has been attributed to informing the development of the transactional model (Sameroff & Mackenzie, 2003)

The Goodness of Fit Model

It was through their research on child temperament and developmental outcomes that Thomas and Chess (1977) established a model of development based on the "goodness of fit" between children and their social environments. Within parent-child relationships, this model explores the dynamics of psychological development through an emphasis on the role of harmony between parent and child characteristics and behaviours (Chess & Thomas, 1996). When there is accordance between the child's capabilities, intentions, and behaviour patterns and their environment (i.e., parental responses, caregiver approaches), there is said to be a "goodness of fit" that fosters optimal positive development. Conversely, mismatch between characteristics and environment prompts a "poorness of fit" that can result in maladaptive functioning and poor developmental outcomes. Essentially, the goodness of fit model predicts developmental outcomes based on the match between child temperament and reactions, expectations, and demands placed on them within the parent-child relationship.

Within the parent-child relationship, this match or "fit" does not necessarily require similarity in parent and child capacities and behaviours (Psychogiou et al., 2008). A positive fit may involve overlapping parent and child traits/behaviours or divergent but complementary traits/behaviours. As such, two separate hypotheses have emerged from this literature (Psychogiou et al., 2008). The former speaks to "similarity-fit," where similarity across parent and child characteristics is thought to relieve stress and promote a shared "tempo of activity" within the parent-child relationship, thus increasing parental empathy and understanding. The latter hypothesis is "similarity-misfit," where similarity in parent and child characteristics may

actually compound or worsen outcomes while complementary characteristics offer a better "fit." Over the past decade, these hypotheses have been explored within ADHD populations to clarify the nature of interaction between parent and child psychopathology (e.g., Psychogiou et al., 2007; 2008; Johnston et al., 2016). While both fit and misfit have been investigated in these ADHD populations, the similarity-fit model has emerged as a particularly promising theory within the field of child psychopathology. Extending beyond ADHD, the similarity-fit hypothesis holds great potential for exploring parent-child relationship dynamics within the context of ASD and the BAP.

The Similarity-Fit Model

The similarity-fit hypothesis was first introduced within the ADHD literature to clarify the relationship between parents and children with ADHD (Psychogiou et al., 2007; 2008). Seminal findings from this research—which were replicated across three successive studies—supported the existence of an interaction between mother and child ADHD symptoms. Using the Alabama Parenting Questionnaire (APQ; Shelton et al., 1996), mothers self-reported on their parenting behaviours—both positive (i.e., positive and involved parenting) and negative (i.e., poor monitoring, use of corporal punishment, inconsistent discipline). When analyzing the independent contributions of ADHD, greater ADHD symptomology in mother *or* child corresponded with lower levels of positive and involved parenting; yet, the interaction of this symptomology—where both mother *and* child had higher levels of ADHD symptomology—seemed to ameliorate this effect (Psychogiou et al., 2007; 2008). In fact, maternal responses to children with heightened ADHD symptomology were more positive and affectionate when the mothers also reported higher ADHD symptomology themselves. Further, maternal ADHD symptoms did not exacerbate negative parenting behaviours typically associated with childhood

ADHD (i.e., poor monitoring, use of corporal punishment, inconsistent discipline). Interestingly, findings with fathers have suggested an opposite effect (i.e., similarity-misfit), where greater paternal ADHD symptomology corresponded with greater parental negativity when the child also had ADHD (Psychogiou et al., 2007). The authors hypothesized that these results relate to differences in parenting gender roles, where fathers may be less nurturing and more aggravated by child symptomology; though more research is needed to directly test this hypothesis.

In accordance with Psychogiou et al.'s (2007; 2008) research, Johnston et al. (2016) found modest support for the similarity-fit hypothesis when investigating positive and involved parenting using the APQ. Findings from this study did not support a definitive advantage of symptom similarity, yet they found that the negative impact of parental inattentive ADHD symptomology was buffered in the presence of child ADHD. They also found some evidence for paternal similarity-misfit, but only for tolerance of child misbehavior. The authors concluded that maternal ADHD symptomology may serve as a protective factor in families with children with ADHD, "dampening" the usual negative association between child ADHD symptoms and positive parenting behaviours.

Support for similarity-fit has also been established for other parenting outcomes. For example, parallels in maternal and child ADHD symptomology—where both mother and child have high symptom ratings—has been associated with lower maternal irritability and less negative corrective feedback towards their child (Griggs & Nikami, 2011). Furthermore, a recent study by Perez Algorta et al. (2018) found that high maternal ADHD symptomology was linked to increased parenting stress levels for mothers of children without ADHD, but not for mothers of children with ADHD—whose parenting stress levels remained constant regardless of ADHD symptomology. They concluded that maternal ADHD symptomology does not appear to account

for the high parenting stress levels experienced by mothers of children with ADHD, though it does correspond with heightened parenting stress for mothers raising a child without ADHD.

While several studies have suggested possible benefits (or at least buffering of negative outcomes) in relation to parent-child ADHD similarity-fit, one recent study failed to confirm these findings (Wymbs et al., 2015). In this study, greater parent reported ADHD symptoms (particularly inattentiveness) was associated with more negative parenting and communication outcomes. Unlike previous research (Psychogiou et al., 2007; 2008), the authors found that this similarity-misfit applied to both mothers and fathers. That said, it is important to note that divergence in their findings likely relates to vastly different methodological approaches; previous research has required families to self-report on parent and child symptoms, while this research involved observation of parents interacting with a confederate child who was trained to "behave like children with [or without] ADHD/ODD" (p. 111). As such, this study cannot speak to the relationships that these parents have established with their own children. When this literature is considered collectively, the similarity-fit hypothesis remains promising as a framework for understanding parent-child relationships and psychopathology.

Similarity-Fit and The Broader Autism Phenotype

Extending beyond the ADHD literature, the similarity-fit hypothesis offers a useful framework for conceptualizing the relationship between parenting, the BAP, and child ASD. This seems a natural extension of this theory given that research has continually established high comorbidity rates between ASD and ADHD, with estimates suggesting anywhere from 33 to 78% of children and adolescents with ASD also have ADHD (see Klinger et al., 2014). Furthermore, these disorders share similarities in neurodevelopmental and genetic factors (Rommelse et al., 2010; Rommelse et al., 2011) and demonstrate overlap in difficulties with

executive functioning and emotion regulation, which have been highlighted as possible transdiagnostic features (Benallie et al., 2021; England-Mason, 2020). Given that both disorders are neurodevelopmentally similar and highly comorbid, the similarity-fit hypothesis may account nicely for parent-child fit in ASD symptomology.

Under the similarity-fit framework, it could be argued that the overlap between ASD and the characteristic features of the BAP better enable a mother to connect with her child with ASD, relate to the challenges that her child faces, and structure the environment in a way that best meets their shared needs. While the BAP is often discussed as a whole, it would benefit this discussion to consider the role of similarity-fit as it relates to core features of the BAP. Research suggests that a wide range of factors may be implicated, but has commonly looked at three core features—as measured by the Broad Autism Phenotype Questionnaire (BAPQ), a commonly used self-report measure of the BAP (see Cruz et al., 2013; Hurley et al., 2007; Sucksmith et al., 2011). These characteristics are rigidity, aloofness, and difficulty with pragmatic language use.

Rigidity

Perhaps the strongest argument for similarity-fit can be built for rigidity—or adherence to rules, routines, and structure. Indeed, provision of routine and structure is a leading recommendation for parents of children with ASD and has been associated with lower co-occurring internalizing symptomology and reduced risk of behaviour problems in this population (Cashin & Yorke, 2018; Larson, 2006; McRae et al., 2019; O'Nions et al., 2018; Seidman et al., 2012). Some mothers of children with ASD have qualitatively conveyed that provision of routine and structure is important, but can be arduous and taxing (McAuliffe et al., 2019). It is conceivable that for those mothers who are more intrinsically structured, this process may feel less exhausting. Indeed, a recent qualitative study found that mothers with autism spectrum

conditions report greater ease in providing routine and structure for their child (Winnard et al., 2021). Additionally, some researchers have posited that greater maternal BAP rigidity may be adaptive for mothers of children with ASD because these characteristics encourage the establishment of a predictable and structured environment for their child (Seidman et al., 2012). Of note, the authors highlighted that greater maternal rigidity may correspond with the BAP or represent the mother's attempts to adapt in response to parenting a child with ASD who requires greater structure. Certainly, it is difficult to tease apart the contributions of nature and nurture in this issue, though the transactional model would suggest that biological and environmental factors are likely interacting within this parent-child relationship (Crowell et al., 2019). Regardless of the direction of this relationship, it seems that there is value to structure and routine when parenting a child with ASD; though, no known research has quantitatively explored the value of BAP rigidity within the role of parenting a child with ASD.

Pragmatic Language

Pragmatic language speaks to the social use of language, or the ability to effectively communicate and connect with others (Hurley et al., 2007; Tager-Flusberg, 2000). Pragmatic language abilities include reciprocal communication, topic maintenance, appropriate cadence, use of intonation, nonverbal communication, and interpreting intended meaning over surface meaning. From a deficit perspective, it seems natural to assume that difficulties with pragmatic language would impair parenting practices for mothers of children with ASD—who also struggle with pragmatic language. That said, few known studies—across the ASD or non-ASD literatures—have actually investigated the interaction between parental pragmatic language patterns and parenting. One recent study found that greater pragmatic language difficulties in mothers corresponded with increased negative affect during a mother-child interaction task but

was not related to mothers' self-reported emotion regulation (Rea et al., 2019). The authors suggested that these findings speak to the difficulties of communicating needs and employing effective communication strategies when mothers struggle with pragmatic language.

Still the question remains whether a match between mother and child pragmatic language could promote more positive outcomes. It seems plausible that mothers who struggle with pragmatic language would be more likely to speak directly, avoid nonverbal or implied messages, and communicate clearly to their child who also struggles with pragmatic language. Interestingly, some research has found that mothers who struggle with pragmatic language are more likely to pair themselves with fathers who similarly struggle with pragmatic language—suggesting a purposeful 'match' between mother and father in communication style (Seidman et al, 2012). Further, despite limited research, some mothers with ASD have spoken about the benefit of the language match in parenting through media interviews (Hill, n.d.; Pacton, n.d.). For example, one mother (Carol Greenberg) stated, "I think I'm more likely to 'get it' than a non-autistic parent. My son and I have different experiences of the world, but I do know exactly how it feels to be penalized for something like violating a social convention I don't understand" (Pacton, n.d.). This suggests the possibility that the shared experience promotes greater understanding in communication between mother and child. Accordingly, a recent study found that mothers who scored higher on the Autism Spectrum Quotient (AQ)—a common measure of BAP characteristics—were more likely to perceive their child's pragmatic language impairments as not being a problem (Hanabusa et al., 2018). The authors concluded that this may be both negative and positive; mothers with greater BAP characteristics may be less irritated by and better able to manage their child's pragmatic impairments, though they may also be less likely to seek support resources for their child if they do not view the pragmatic impairment as a problem.

More research is needed to further clarify the impact of mother and child pragmatic language "fit" on parenting outcomes.

Aloofness

Within the study of the BAP, aloofness generally speaks to social disinterest or a lack of enjoyment derived from social interaction (Hurley et al., 2007; Seidman et al., 2012). The term "aloof", in itself, may promote a deficit-based perspective on this trait, yet an argument can be made for the role of similarity-fit in the parent-child relationship. Through the media, mothers with ASD have spoken on the potential benefits of maternal ASD traits like aloofness. Some mothers have emphasized how their shared social experiences have brought unique understanding of their child's preferences for social and physical contact; approaches to interaction and play (i.e., non-imaginary play); and difficulties in social contexts (see interviews by Hill, n.d.; Pacton, n.d.). Some have also highlighted how this shared experience helps with supporting their child through social difficulties, as they can draw upon their own experiences and learned coping strategies. Recent qualitative research echoes these perspectives, finding that mothers with autism spectrum conditions report benefits to being an 'expert-by-experience' which has given them unique insight into their child's social world (Winnard et al., 2021).

While Winnard et al.'s (2021) study is the only known research to have directly investigated the perspectives of mothers with ASD, there is also some indirect literature to support these claims. For example, qualitative research involving members of the autism community has emphasized the importance of solitude—conveying it as necessary for promoting happiness and overall wellbeing in children, adolescents, and adults with ASD (Post et al., 2017; Ward & Montgomery, 2017). Additionally, some parents of children with ASD have reported 'missing out' or feeling 'hurt' by their child's aloofness and lack of physical connection in their

parent-child relationship (Cullen & Barlow, 2002). Unfortunately, this research did not assess for levels of the BAP; though, it seems plausible that mothers who felt hurt by their child's aloofness were less aloof themselves. Perhaps when both mother and child align in their social preferences—with a shared desire for times of solitude and differential displays of affection—positive parenting outcomes are promoted. This hypothesis aligns with research suggesting that parental affection fosters positive psychological and relational benefits when it falls within the child's range for optimal tolerance (i.e., neither too much, nor too little affection)—which can differ from one child to another (Hesse et al., 2018). Interestingly, a recent study looking at college roommates found that relationship satisfaction was higher when both roommates were aloof, compared to when there was a mismatch in this BAP trait (Faso et al., 2016). The authors suggested that parallels in social motivation may promote greater relationship quality. Conversely, a study involving parents found that fathers who were more aloof were more likely to be paired with mothers who were less aloof (Seidman et al., 2012). Further, parental warmth, affection, and engagement have been found to promote positive outcomes for children more generally, including psychological adjustment and social-emotional well-being (Hesse et al., 2018; Khaleque, 2013; Newland, 2015); though few studies have explored these parenting behaviours in ASD families. Clearly more research is needed to clarify the role of similarity-fit within the BAP and parenting, particularly as it relates to the parent-child relationship in ASD families.

Similarity-Fit and ASD

While there has been limited research in this area, some studies have begun to explore the transactional influence of autism and BAP characteristics in the parent-child relationship; though most of this research has investigated ASD or BAP total scores instead of looking at separate

domain characteristics. These studies have also looked at varied parenting outcomes and used different measures; consequently, findings have been mixed. Research by Van Steijn et al. (2013a; 2013b; 2015) directly considered the transactional nature of parent and child ASD symptoms on several parenting outcomes. They did not explicitly identify an interest in exploring the BAP, but assessed parental ASD symptomology using the Adult Autism Spectrum Quotient (AQ; Baron-Cohen et al., 2001), which is a measure of ASD characteristics that has also successfully been used as a measure of the BAP (Ingersoll & Wainer, 2014). They found that parental ASD symptoms were associated with poorer child perceptions of the parent-child relationship regarding their relationship with fathers but not mothers (van Steijn et al., 2013a). From this, they suggested that fathers with greater rigidity and social skill deficits may struggle more with maintaining positive parent-child relationships, compared to mothers with these same characteristics. However, when both parent and child ASD symptoms were considered, the authors found that the interaction between parent and child ASD symptoms did not predict child perceptions of the parent-child relationship (van Steijn et al., 2013a). In other words, fit or misfit between parent and child ASD symptomology did not seem to impact the parent-child relationship—at least as perceived by the child. Conversely, they did find support for an interaction when looking at mother-reported parenting styles (van Steijn et al., 2013b); maternal ASD symptomology corresponded with a more permissive parenting style, but only towards their typically developing children, not their ASD children (van Steijn et al., 2013b). From these findings, they hypothesized that similarity in ASD symptoms between mother and child may promote optimal parenting approaches, though they suggested that further research is needed to disentangle this interaction.

Similarly, Lau et al. (2016) suggested that maternal ASD characteristics may benefit maternal approaches to parenting a child with ASD due to "attention to detail, logical thinking, and persistence, combined with a tendency to approach rather than avoid family problems" (p. 62). While they did not directly test this hypothesis, their research found that mothers with ASD reported similar levels of parenting efficacy to mothers without ASD—both in families of children with and without ASD. In contrast, ASD symptomology in fathers was negatively associated with parenting efficacy. As with van Steijn et al. (2013a), they suggested that fathers with ASD may have greater difficulty managing the parent-child relationship than mothers with ASD. Accordingly, some research has found that parental ASD symptomology is related to increased parenting stress for fathers but not mothers of children with ASD and/or ADHD (van Steijn et al., 2014). The authors posited that perhaps this relates to socialized gender norms, where mothers tend to hold greater responsibility for household and childcare tasks while fathers are generally more involved in play and recreational activities—which would be differentially impacted by deficits associated with ASD (Craig, 2006; van Steijn et al., 2014).

Despite emerging research suggesting the potential for positive parenting outcomes among mothers with ASD/BAP, not all studies have supported this conclusion. Some research suggests a negative correlation between maternal ASD symptoms and family relationship quality (i.e., cohesion, expressiveness, and conflict), though, they did find that this interaction was stronger for fathers than for mothers (van Steijn et al., 2015). Another study investigating the use of a parent-mediated intervention for children with ASD found that higher maternal BAP scores corresponded with less change in mother-child interaction across treatment, suggesting that the BAP could negatively impact parent-based treatment outcomes in ASD families (Parr et al., 2015). Finally, other research has found that higher scores on the aloofness subscale of the

BAPQ correspond with increased depressive symptoms in mothers of children with ASD, though this relationship was mediated by relationship satisfaction (Pruitt et al., 2018). This study also revealed a positive association between maternal depressive symptomology and child behaviour problems. In their interpretation of these results, the authors drew a path between maternal BAP and child behaviour patterns; BAP aloofness corresponded with lower relationship satisfaction, which was associated with increased depressive symptoms. Greater depressive symptomology was subsequently associated with increased child behaviour problems. This suggests a potential indirect relationship between maternal BAP and child behaviour outcomes; however, further research is needed to confirm this relationship.

While research on the dynamics between the BAP and parenting remains scarce, interest is growing—particularly in relation to families of children with ASD. Given the gaps in this literature, which is limited by few and conflicting findings, more research is clearly needed. Through the strength-based lens of the similarity-fit hypothesis, the present study builds upon previous research by directly exploring the role of the BAP in motherhood.

Chapter 2: The Current Study

Within the current study, the similarity-fit hypothesis offered a guiding framework through which to explore the relationship between the BAP and maternal parenting outcomes in a sample of mothers of boys between ages 6 to 11 (with and without ASD). While the prospect of comparing the similarity-fit hypothesis across mothers and fathers is certainly intriguing—particularly given emerging evidence suggesting that the BAP may differentially interact with parenting across genders—the scope of this study was limited to mothers as this is the first known study to explore similarity-fit in BAP populations. An initial focus on mothers is a natural starting place, given that mothers continue to share greater caregiver responsibilities in families with and without children with ASD (Gray, 2003; Hartley et al., 2014; Hartley & Shucltz, 2015; Teehee et al., 2009). Additionally, maternal perspectives are predominant in the ASD literature, yet research has largely focused on experiences relating to having children with ASD—particularly sons—instead of exploring the role of BAP or ASD characteristics in parenting experiences. The decision to focus on mothers of *boys* is also logistical and accounts for well-established findings that ASD is far more prevalent in boys—with recent approximations suggesting a diagnostic gender ratio of 3.1:1 (male: female; Loomes et al., 2017). This ratio is presumed to be even higher in ASD populations without co-existing intellectual disabilities, as girls with intellectual disabilities are more likely to receive an ASD diagnosis than girls with normal-range IQ (Loomes et al., 2017; Rivet and Matson, 2011). As such, realistic recruitment efforts would have resulted in a far smaller subset of participants who identify having a girl with ASD, which would have inhibited the comparison of gender differences across children relative to the parenting relationships and experiences of mothers. Lastly, only mothers of biological sons between 6 and 11 years of age were included in the present study. This age range was chosen

because (1) it approximated ranges used in past similarity-fit research (e.g., Johnston et al., 2016; Psychogiou et al., 2008); (2) it was wide enough to allow for the exploration of age as a covariate; and (3) the boys were considered old enough to have received a reliable ASD diagnosis by this age. A biological relationship between mother and son was deemed necessary to promote sample homogeneity and account for biological contributions to the BAP and ASD within parent-child relationships.

The primary goal of this research was to discover whether there is evidence for similarity-fit in the interactions between child ASD, maternal BAP, and parenting outcomes. To accomplish this objective, North American mothers of boys (ages 6-11) were recruited to participate in an online survey. Survey measures enabled exploration of mother-child similarity-fit in ASD/BAP across three separate parenting outcomes: (1) positive and involved parenting; (2) negative parenting behaviours (i.e., poor monitoring/supervision and inconsistent discipline); and (3) parenting stress. The selection of these criterion variables corresponds with their relevance and importance within the similarity-fit and ASD literature.

Parenting Behaviours

Parenting behaviours—including positive parenting, involvement, supervision, and discipline—have been a central focus of previous similarity-fit research (e.g., Johnston et al., 2016; Psychogiou et al., 2007; 2008). Across the similarity-fit and ASD literatures, these behaviours have often been studied by combining the behaviours into two overarching domains: (1) positive and involved parenting; and (2) negative parenting behaviours. Positive and involved parenting has generally referred to the degree of parental involvement, praise, affection, and warmth displayed (Essau et al., 2006; Johnston et al., 2016). Conversely, negative parenting

behaviours have typically involved a focus on poor supervision and monitoring, as well as inconsistent disciplinary techniques (McRae et al.; 2018; 2019; Psychogiou et al., 2007; 2008).

While parenting behaviour variables have been central to the emerging ADHD similarity-fit research, they have received less attention within the ASD literature, which likely—at least in part—stems from the sensitive nature of this field, which has evolved from a troubling history of parent blaming (Boonen et al., 2015). Interestingly, there is some emerging evidence to suggest that parents with greater autism traits who have children without ASD report lower levels of involvement with their child compared to parents with less autism traits (Dissanayake et al., 2020). These findings may suggest that the misfit in characteristics between parent and child corresponds with poorer outcomes, thus aligning with the similarity-fit hypothesis; however, the researchers did not explore parenting outcomes among parents and children who were similar in traits (i.e., both with high ASD symptomology or both with low ASD symptomology) and so concrete conclusions cannot be drawn. The limited literature in this area points to a critical need for further investigation—particularly given that positive and involved parenting promotes child psychological adjustment and social-emotional well-being (Haven et al., 2013; Hesse et al., 2018; Newland, 2015). Further, poor supervision and inconsistent disciplinary practices can negatively impact child development and increase internalizing and externalizing problems (Cheung et al., 2018; McRae et al., 2018).

While research on parenting behaviours in ASD families is sparse, there have been a few studies that have explored positive and negative parenting behaviours in families of children with ASD. Similar to the ADHD literature, this research has suggested significantly lower positive and involved parenting and increased negative parenting outcomes in mothers of children with ASD—as measured by the APQ (McRae et al., 2018; 2019). That said, other studies have

revealed mixed results, where mothers of children with ASD report lower use of rules and discipline, but more positive parenting and less use of harsh punishment (Lambrechts et al., 2011; Maljaars et al., 2014). These discrepancies not only suggest a need for further clarifying research, but also greater investigation into the factors that contribute to differential outcomes in families of children with ASD. Most notably, previous research on ASD and parenting behaviours has failed to consider the interaction of maternal BAP/ASD traits with parenting behaviours—though some researchers have acknowledged that the BAP may be involved (e.g., McRae et al., 2018; 2019). Using the similarity-fit framework, the present study sought to address this gap through an exploration of the BAP, child ASD, and maternal parenting behaviours.

Parenting Stress

Parenting stress has only recently been investigated within the context of interacting mother and child ADHD characteristics (Perez Algorta et al., 2018). While these researchers did not explicitly investigate from a similarity-fit lens, their findings support the role of similarity-fit between mother and child. In light of these promising research findings, it seems valuable to explore this outcome in the present study, especially given that parenting stress is one of the most researched parenting variables within the field of ASD (Maljaars et al., 2014). The disproportionate attention devoted to parenting stress may relate to the importance of this variable within the parent-child relationship—as it both influences and is influenced by parent and child wellbeing (Deater-Deckard, 1998; Rodriguez, 2011). It is also a relatively safe parenting variable to explore within a field that continues to sensitively navigate the line of parent blaming.

Parenting stress refers to aversive distress that derives from the role of parenting (Deater-Deckard, 1998). Research consistently indicates that parents of children with ASD experience higher rates of parenting stress than parents of typically developing children as well as children with other disabilities—including Down syndrome, cerebral palsy, and intellectual disability (Craig et al., 2016; Hayes & Watson, 2013; Keenan et al., 2016; Pisula & Porębowicz-Dörsmann, 2017). This finding persists in ASD populations with *and* without co-occurring intellectual impairment (Craig et al., 2016; Derguy et al., 2016). While studies consistently support higher levels of parenting stress in ASD families, it is worth noting one other population that compares. Research suggests that parenting stress is similar—if not greater—in parents of children with ADHD (Craig et al., 2016; Miranda et al., 2015; van Steijn et al., 2014). This is worth noting, considering the high rates of comorbidity between ADHD and ASD—suggesting that parents within these populations are at a great risk of experiencing stress within their parenting role.

Given well-established findings that mothers of children with ASD (and ADHD) experience heightened rates of parenting stress, it seems important to understand factors that may contribute to this relationship. In particular, it seems valuable to consider the bidirectional influence of parent and child traits—as parenting stress derives from the transactional nature of the parent-child relationship. Indeed, some researchers have emphasized the need for further investigation, noting that the lack of research exploring the role of the BAP in parenting stress and ASD research is a major limitation within this literature (Pisula & Porębowicz-Dörsmann, 2017). Two known studies have looked at the relationship between parenting stress and the BAP in parents of children with ASD, finding that greater levels of the BAP corresponded with increased parenting stress (Derguy et al., 2016; Ingersoll & Hambrick, 2011). That said, Ingersoll

and Hambrick (2011) found that this relationship was not direct and was mediated by other factors such as level of social support and maladaptive coping. Further, neither of these studies explored the transactional nature of parent and child traits, nor did they investigate the individual domains of the BAP. Perhaps the "match" between maternal BAP traits (i.e., rigidity, aloofness, pragmatic language difficulties) and child ASD traits mitigates levels of distress associated with the demands of parenting a child with ASD.

Research Questions

The primary objective of this study was to clarify the role of similarity-fit in the interactions between child ASD, maternal BAP, and parenting outcomes—including positive and involved parenting, negative parenting practices, and parenting stress. In alignment with the similarity-fit hypothesis, it was hypothesized that higher maternal BAP characteristics (i.e., rigidity, aloofness, and pragmatic language difficulties) would predict lower levels of parenting stress, greater positive and involved parenting, and lower engagement in negative parenting practices (i.e., poor supervision, inconsistent discipline) for mothers of children with ASD. Given previous research suggesting similarity-fit in ADHD populations (Johnston et al., 2016; Perez Algorta et al., 2018; Psychogiou et al., 2007; 2008), and in light of high rates of comorbidity between ASD and ADHD (see Klinger et al., 2014), mother and child ADHD symptomology was controlled for in all analyses. The research questions that guided this study are outlined below.

Positive and Involved Parenting

Consistent with the similarity-fit hypothesis—where a "fit" in mother and child symptoms is thought to promote more positive and involved parenting—the following questions were asked:

1. Do greater levels of maternal *rigidity* predict more positive and involved parenting practices in mothers of boys with ASD compared to mothers of boys without ASD?
2. Do greater levels of maternal *aloofness* predict more positive and involved parenting practices in mothers of boys with ASD compared to mothers of boys without ASD?
3. Do greater maternal *pragmatic language difficulties* predict more positive and involved parenting practices in mothers of boys with ASD compared to mothers of boys without ASD?
4. Do greater levels of maternal *BAP characteristics (overall)* predict more positive and involved parenting practices in mothers of boys with ASD compared to mothers of boys without ASD?

Negative Parenting Practices

Consistent with the similarity-fit hypothesis—where a "fit" in mother and child symptoms is thought to decrease negative parenting practices (i.e., poor supervision/monitoring and inconsistent discipline)—the following questions were asked:

5. Do greater levels of maternal *rigidity* predict less negative parenting practices in mothers of boys with ASD compared to mothers of boys without ASD?
6. Do greater levels of maternal *aloofness* predict less negative parenting practices in mothers of boys with ASD compared to mothers of boys without ASD?
7. Do greater maternal *pragmatic language difficulties* predict less negative parenting practices in mothers of boys with ASD compared to mothers of boys without ASD?
8. Do greater levels of maternal *BAP characteristics (overall)* predict less negative parenting practices in mothers of boys with ASD compared to mothers of boys without ASD?

Parenting Stress

Consistent with the similarity-fit hypothesis—where a "fit" in mother and child symptoms is thought to promote lower parenting stress levels—the following questions were asked:

9. Do greater levels of maternal *rigidity* predict lower levels of parenting stress in mothers of boys with ASD compared to mothers of boys without ASD?
10. Do greater levels of maternal *aloofness* predict lower levels of parenting stress in mothers of boys with ASD compared to mothers of boys without ASD?
11. Do greater maternal *pragmatic language difficulties* predict lower levels of parenting stress in mothers of boys with ASD compared to mothers of boys without ASD?
12. Do greater levels of maternal *BAP characteristics (overall)* predict lower levels of parenting stress in mothers of boys with ASD compared to mothers of boys without ASD?

Chapter 3: Method

Participants

A total of 143 eligible mothers from Canada and the United States of America participated in the present study. All mothers had a biological son between 6 and 11 years of age. Among this sample, 57 mothers had at least one son with ASD within the target age range (ASD group) and 86 mothers had at least one son within the target age range and no children with ASD (comparison group). All sons in the ASD group were previously diagnosed with ASD or a former diagnostic label (i.e., autistic disorder, Asperger's disorder, pervasive developmental disorder not otherwise specified) by a qualified medical doctor or psychologist. A brief ASD screening measure, the Autism Spectrum Quotient, was used to corroborate these diagnoses. In families with more than one eligible son within the target age range, mothers were asked to complete child symptom and parenting measures based on their oldest eligible son. To ensure sample homogeneity, mothers were excluded from this study if their child (with or without ASD) had significant intellectual deficits, as these additional challenges may alter family and parenting dynamics in diverse ways (Pastor-Cerezuela et al., 2016; Salamone et al., 2018).

Recruitment

Before initiating study recruitment, ethical approval was obtained through the Psychology/Sociology Research Ethics Board (PSREB) at the University of Manitoba. Mothers were recruited to participate in this online study from February 2020 to March 2021. Of note, shortly after initiating recruitment a global pandemic was declared on March 11, 2020 due to the rapid outbreak of Covid-19. Unfortunately, this study was designed, piloted, and initiated prior to the onset of this pandemic, and as such, was not able to account for the role of the pandemic in parenting outcomes.

Given the challenges of recruiting a highly specific group of mothers during a global pandemic, intensive recruitment efforts were employed to obtain an adequate sample. Over 60 ASD service organizations and child clinical, research, and medical networks from across North America were contacted about recruitment for this study. Recruitment through these networks required organizations to send emails or post advertisements about this study (i.e., posting a physical copy or webpage advertisement). Email invitations and advertisements outlined relevant study details, provided contact information, and offered a link that directed participants to the online survey (see Appendix A). Additionally, close to 500 social media group administrators (largely via Facebook and Instagram) were contacted about sharing our study advertisement on their online social media pages. The majority of these groups were support groups for parents and families of children with ASD, ADHD, or general parenting support needs. Social media pages for ASD and ADHD service organizations were also contacted. Furthermore, several interviews were provided to print and television news sources to encourage knowledge translation and recruitment interest. Participants were also recruited through the University of Manitoba psychology participant subpool, where they received course credit in their introductory psychology class for participation. Lastly, efforts were made to recruit participants via Amazon Mechanical Turk (MTurk); however, this recruitment approach was quickly discontinued as it seemed to mainly result in the recruitment of automated survey bots. For greater detail regarding recruitment demographics for participants included in this study, please refer to the results section.

Sample Size

Using G*Power 3.1 software (Faul et al., 2007), a power analysis was conducted to ensure adequate power (.80) was achieved at an alpha level of .05. Based on previous similarity-fit literature (Johnston et al., 2016; Psychogiou et al., 2008), a medium effect size (Cohen's $f^2 = .15$) was used to run this analysis. The results of this analysis suggested the need for a sample of 120 mothers, ideally including 60 mothers of sons with ASD and 60 mothers of sons without ASD. A similar sample size has been used in past similarity-fit research (Johnston et al., 2016). The present study surpassed this sample recommendation with 143 mothers participating, including 57 mothers of sons with ASD and 86 mothers of sons without ASD. An oversampling approach was implemented to achieve this sample size, resulting in a total recruitment of 533 participants. Unfortunately, the majority of these participants were ineligible for inclusion in the present study due to partially completed surveys and failure to meet stringent eligibility criteria. Mainly, participants were excluded because (a) they did not live in North America, (b) they identified as a father, (c) they did not have a son within the designated age range, (d) they did not have a biological relationship with their child, (e) their son had co-occurring cognitive impairment, (f) they discussed a son without ASD while having another child with ASD, (g) their son fell between cut-off scores on an ASD screening measure, or (f) they did not complete key survey measures necessary for analysis. One participant was also excluded due to suspected duplication in data.

Measures

Demographic Questionnaire

Participants were asked to complete a questionnaire composed of demographic questions to obtain relevant information about descriptive statistics and predictor variables. These variables included age, race/ethnicity, place of residence, socioeconomic status, family composition,

diagnostic comorbidities, and recruitment source. Additionally, three questions were included to inquire about social supports and parenting. Using a sliding scale, parents were first asked to *Rank how well you feel your support needs for your child/family are being met.* They were then asked the following questions: *What supports are you currently receiving for your child and/or family (paid for by yourself, the education system, health care funding, or other government sources)?* and *What supports do you feel you need?* A more detailed outline of the demographic questionnaire can be found in Appendix B.

Developmental Screening

To rule out the presence of significant child intellectual deficits, mothers were asked to complete the *Communication Subtest* from the third edition of the *Ages and Stages Questionnaire—60 Month Questionnaire* (ASQ-3; Squires & Bricker, 2009). This 6-item measure was intended for screening purposes only and was used to identify children who had not developed communication skills that surpass those seen by children of at least 57 - 66 months of age (4.75 - 5.5 years). Mothers were asked to rate "yes", "sometimes", or "not yet" for each item regarding their child's developmental progress. Items assessed skills relating to following basic directions (i.e.., "clap your hands, walk to the door, and sit down"), answering basic questions (i.e., "what do you eat when you are hungry"), using four- and five-word sentences, using suffixes (e.g., "-ed") and comparison words (e.g., "heavier", "shorter"), and repeating sentences back (e.g., repeating "Jane hides her shoes for Maria to find"). Items were used to derive a subtest score that rated communication development as "on schedule" (i.e., score falls above threshold), in need of ongoing monitoring (i.e., score within designated range of threshold), or in need of further assessment regarding delay (i.e., score falls below threshold). Given the screening purposes of this measure within the present study, participants with child scores falling

below the threshold were excluded from this study. The ASQ-3 has been found to have high specificity (93.3%) and sensitivity (100%) in discriminating between children with and without delays (Squires & Bricker, 2009). Sufficient test-retest reliability (r = .75 - .82), interobserver reliability (r = .43 - .69), and internal consistency (Cronbach's α = .51 - .87) have also been established (Hanig, 2010; Squires & Bricker, 2009).

Maternal BAP Characteristics

Mothers completed the *Broad Autism Phenotype Questionnaire* (BAPQ; Hurley et al., 2007) to assess the extent to which their personality and language traits align with autism symptomology. As the first self-report questionnaire specifically designed to assess the BAP, the BAPQ is widely recognized in the literature as a leading measure in the field (Broderick et al., 2015; Ingersoll & Wainer, 2014). It has been developed to discriminate between those with and without BAP traits in both clinical and non-clinical populations, thus supporting its utility in research with ASD families as well as the general population (Hurley et al., 2007; Ingersoll et al., 2011). It consists of 36 items and uses a 6-point scale ranging from 1 (*never*) to 6 (*always*).

The BAPQ assesses characteristics across three separate domains: aloofness, rigidity, and pragmatic language difficulties. Within the BAPQ, aloofness is conceptualized as social disinterest, disengagement, or displeasure; rigidity refers to a preference for sameness and/or difficulty adjusting to change; and pragmatic language difficulties considers challenges with the social use of language that can impair communication and interactions. These three factors were incorporated into the BAPQ due to their theoretical relevance and correspondence with core ASD features (i.e., social deficits, communication deficits, and repetitive and restricted behaviours). In addition to computing a score for each of the three BAPQ subscales, a Total BAP score was computed. Given that the literature recognizes different patterns of the BAP, where

parents may report features in one, two, or all three of these categories (Hurley et al., 2007; Sasson et al., 2013a), each BAP domain was analyzed both separately and together (i.e., Total score) in the current study.

The BAP was measured continuously in the present study, aligning with past similarity-fit research and recommendations that research on the BAP among ASD and control groups reflect the continuous distribution of the BAP in the population (Rubenstein & Chawla, 2018). For reference, Maxwell et al. (2013) documented average total BAP self-report ratings as 2.49 among mothers of children with ASD and 2.25 among parents of children without ASD (Maxwell et al., 2013). Similarly, Sasson et al. (2013a) reported averaged self-informant ratings for mothers of children with ASD as 2.68 for aloofness, 2.48 for pragmatic language difficulties, 3.14 for rigidity, and 2.77 for total BAP. Among mothers of children without ASD, they found averaged self-informant ratings of 2.44 for aloofness, 2.27 for pragmatic language difficulties, 2.95 for rigidity, and 2.55 for the total BAP score.

While the psychometric study of BAP self-report measures is still in its infancy, the BAPQ seems to display stronger psychometric properties than other leading self-report BAP measures (Ingersoll et al., 2011). In comparison to parents of typically developing children, parents of children with ASD have been found to score significantly higher on all three domains of the BAPQ (Hurley et al., 2007). High internal consistency (Cronbach's α = .85 - .95), sensitivity (70 – 81.8%), and specificity (73.8 – 81.8%) have been established (Hurley et al., 2007; Sasson et al., 2013a). The BAPQ also demonstrates adequate criterion validity, incremental validity, and a replicable factor structure that corresponds with the construct of the BAP (Ingersoll et al., 2011). For example, this measure has been found to suitably correlate with measures of related constructs including social phobia (r = .54), interpersonal problems (r = .47),

schizoid personality disorder (r = .49), obsessive-compulsive disorder (r = .43), extraversion (r = -.59), agreeableness (r = -.54), and neuroticism (r = .49; Ingersoll et al., 2011). It should be noted, however, that little research has sought to validate the BAPQ with measures specific to language and communication (Losh et al., 2011; Sucksmith et al., 2011).

Maternal ADHD Symptoms

To assess ADHD symptomology, mothers completed the *Current Symptoms Scale* from the *Barkley Adult ADHD Rating Scale-IV* (BAARS-IV; Barkley, 2011). The BAARS-IV and previous versions have been used in past similarity-fit research (e.g., Johnston et al., 2016; Psychogiou et al., 2007, Psychogiou et al., 2008). This adult self-report measure (for ages 18-89) explores current ADHD symptomology using 27 items that encourage the rating of each behaviour from 1 (*rarely or never* occurs) to 4 (occurs *very often*). The BAARS-IV was derived from diagnostic criteria outlined in the revised fourth edition of the Diagnostic and Statistical Manual (DSM-IV; APA, 2000). As such, it assesses ADHD across four symptom categories: ADHD Inattention, ADHD Hyperactivity, ADHD Impulsivity, and Sluggish Cognitive Tempo. The three ADHD subscales can also be combined to compute a Current ADHD total symptom score, which will be used in the present study. The BAARS-IV has been found to have high internal consistency (Cronbach's α = .92 - .95) as well as satisfactory test-retest reliability (r = .66 – .88) and construct validity (r = .67 – .81; Barkley, 2011; Crumpton, 2014).

Child ASD Symptoms

Mothers were asked to complete the *Autism Spectrum Quotient—Child Version* (AQ-C; Auyeng et al., 2008), a 50-item parent-report measure of autism symptomology for children between 4–11 years of age. Items are rated using a 4-point scale ranging from 0 (*definitely agree*) to 3 (*definitely disagree*). The AQ-C provides a total measure of autism symptomology by

exploring five domains: social skills, communication, imagination, attention switching, and attention to detail. The AQ-C has excellent internal consistency (Cronbach's α = .83-.97) and test-retest reliability (Cronbach's α = .85; Auyeng, et al., 2008). Within the present study, mothers were required to rate their child at or above 76 on the AQ-C to be eligible for inclusion in the ASD group (i.e., mothers of sons with ASD), as this cut-off has corresponded with optimal sensitivity (95%) and specificity (95%; Auyeng et al., 2008). Conversely, mothers in the comparison group (i.e., mothers of sons without ASD) were required to rate their child at or below 66, as this cut-off has corresponded with the greatest level of sensitivity (99%) and best ensured that these children did not have ASD.

Child ADHD Symptoms

The *ADHD Rating Scale—IV* (ADHD-RS-IV; Dupaul et al., 1998) was used to assess child ADHD symptomology. This parent-report measure was created for children 5-18 years of age based on diagnostic criteria for ADHD from the DSM-IV (APA, 2000). The ADHD-RS-IV offers information about inattention (9 items), hyperactivity-impulsivity (9 items), and total ADHD symptomology (18 items). Items are rated on a 4-point Likert scale from *never or rarely* to *very often*. Within this study, this measure was used to screen for ADHD—in addition to maternal confirmation that an ADHD diagnosis has been made by a medical professional. As with previous similarity-fit research (i.e., Johnston et al., 2016), ADHD classification required mothers to rate their child as having at least six inattention and/or six hyperactive/impulsive symptoms (*often* or *very often*) as well as indicate that these symptoms are impairing child functioning at home or school (*often* or *very often*). The total ADHD symptomology scale was also used as a continuous measure of child ADHD symptomology in primary regression analyses. The ADHD-IV-RS has been found to have adequate internal consistency (Cronbach's α

= .86-.96), test-retest reliability (Cronbach's α = .78-.86; Pappas, 2006), and predictive validity (60-78% accuracy). Further, research suggests that the ADHD-RS-IV can be used to differentiate between ADHD and pervasive developmental disorders (Fujinayashi et al., 2010).

Parenting Stress

The *Parenting Stress Index–4—Short Form* (PSI–4 –SF) was completed to assess parenting stress (Abidin, 2012). This self-report form is intended for parents of children under the age of 12. It includes 36 items that are rated on a 5-point scale from *strongly agree* to *strongly disagree*. These items are grouped to assess three separate domains: Parental Distress, Parent-Child Dysfunctional Interaction, and Difficult Child. The Parental Distress scale evaluates the extent to which parents feel competent, supported, conflicted, restricted, and/or depressed in their parental role. The Parent-Child Dysfunctional Interaction scale assesses level of satisfaction with the parent-child relationship and interactions. The Difficult Child scale explores parental perceptions of their child and perceived level of difficulty around caring for them. A Total Stress Scale can also be calculated to determine the overall level of parental stress, where raw scores at/above 110 signify high parenting stress levels and raw scores at/above 115 indicate clinically significant levels of parenting stress. The present study used the Total Stress Scale to assess overall level of parental stress. The PSI–4–SF has high internal consistency (Cronbach's α = .88 - .95). Additionally, the Total Stress Scale on the short form is highly and significantly correlated with the Total Score on the full PSI inventory (r = .98; Young, 2014).

Parenting Practices

Mothers also completed the *Alabama Parenting Questionnaire* (APQ), a measure of positive and involved parenting behaviours (Duppong et al., 2014; Frick, 1991). The APQ has consistently been used in past similarity-fit research to assess parenting practices (e.g., Johnston

et al., 2016; Psychogiou et al., 2007, Psychogiou et al., 2008). The APQ is a parent-report measure for parents of children over the age of six. It includes 42 questions that require parents to respond to how often items typically occur in their home. Items are rated on a 5-point scale from 1 (*never*) to 5 (*always*). The APQ explores five domains of parenting including parental involvement, poor supervision and monitoring, positive parenting, inconsistent discipline, and corporal punishment. The APQ has been shown to have good test-retest reliability (r = .84 - .90) and expected patterns of convergent and discriminant validity between the APQ and subscales of the Strengths and Difficulties Questionnaire, which is a child measure of social, emotional, and behavioural symptoms (Dadds et al., 2003). Research also suggests acceptable levels of internal consistency for parent ratings on positive parenting, parental involvement, and inconsistent discipline (Cronbach's α = .68 - .82), with slightly lower internal consistency for the poor monitoring/supervision subscale (Cronbach's α = .52-.71) and low internal consistency for the corporal punishment subscale (Cronbach's α = .46-62; Dadds et al., 2003; Shelton et al., 1996). As such, the present study only looked at four of the APQ subtests: positive parenting, parental involvement, inconsistent discipline, and poor monitoring/supervision. In accordance with previous similarity-fit research (Johnston et al., 2016; Psychogiou et al., 2007, Psychogiou et al., 2008), these APQ domains were grouped into two outcomes variables: positive and involved parenting (i.e., positive parenting, parental involvement) and negative parenting behaviours (i.e., poor supervision and monitoring, inconsistent discipline). Previous research involving parents of children with ASD has found adequate internal consistency for the positive parenting (Cronbach's α = .85) and negative parenting composites (Cronbach's α = .66; Bader & Barry, 2014).

Procedures

The aforementioned measures were compiled into an online questionnaire using Qualtrics (Qualtrics LCC, 2019), software for survey creation and data collection. This research project was part of a larger study, and as such, included survey questions and items that were not directly related to the goals of this project. See Appendix C for a list of all survey measures and corresponding time requirements. Most participants took approximately 30 – 90 minutes to complete the survey. To reduce completion time, the survey was branched so that participants only responded to those questions that applied to them. For example, mothers of children without ASD were not required to subsequently report on ASD diagnostic details. Participants were also given the option to complete the survey in several sittings if needed.

Prior to initiating recruitment, the Qualtrics survey underwent pilot-testing to identify and address any unanticipated linguistic or technical problems. In the first stage of pilot testing, seven women from the Family and Developmental Psychology research lab completed the survey using predetermined parent profiles to ensure that the survey logic chain worked effectively and to identify any errors in question wording or organization. Following this step, five mothers of children with and without ASD, as well as one adult woman with ASD, reviewed the survey to offer feedback on survey content and wording. For example, following the advice offered by these women, the consent form was simplified, reworded, and restructured; items relating to corporal punishment were removed; and survey instructions were clarified. Collectively, this feedback was vital to improving the quality of the survey, confirming the appropriateness of questions, and better ensuring that this study fit the knowledge needs of the populations it serves.

Once feedback was incorporated and the survey was finalized, recruitment invitations and advertisements were distributed. These advertisements included a link that directed participants to the online survey. Before starting the survey, participants were prompted to provide informed consent by first reading about relevant study information and important consent details, and subsequently acknowledging an interest to participate. A copy of this consent form can be found in Appendix D. Participants were encouraged to answer all survey questions while also being informed that they could discontinue the survey at any point without penalty. Participants were notified that any questions answered before quitting the survey may be used as data. After completing the survey, participants were thanked for their time and provided with debriefing information (see Appendix E). To convey appreciation for their participation and contributions to this research, participants were offered the opportunity to enter a draw for one of five $50.00 Amazon gift cards as an honorarium. They were also asked whether they would like a summary of the survey results (in aggregate form). Participants were given the option of providing an email address for these purposes. Provided email addresses were not linked to participant survey responses. To view the survey summary provided to participants, see Appendix F.

Chapter 4: Results

Data Preparation

Data Cleaning

Study data was exported from Qualtrics into the Statistical Package for the Social Sciences (SPSS) Version 26.0 software (IBM Corp., 2019) to allow for data cleaning and analysis. Several steps were taken to prepare the study data for analyses. Data was first checked for accuracy, ensuring that all duplicate data was removed and responses for each independent and dependent variable fell within expected ranges. All participant data fell within expected ranges for each variable measure. One case was deemed a duplicate and was removed from the data.

Missing Data

The data was then checked for missing values, which were resolved on a measure-by-measure basis using the guidelines outlined for each measure. No instructions were available for the APQ or BAPQ. In these instances, missing items were treated using valid mean substitution within the corresponding subscale. Mean substitution has been deemed appropriate for instances where only a small proportion of data is missing (<10%) and the study includes a large sample size (Dodeen, 2003; Parent, 2013)—such as in the present study. This approach has also previously been implemented in other studies using the APQ and BAPQ (e.g., Gardner & Woolgar, 2018; Shivers et al., 2013; Wainer et al., 2013) and offered consistency to the treatment of data in the present study as it paralleled the guidelines provided for other measures used in this study.

Due to the online nature of this study, opportunities to ensure full completion of survey items were not available. As such, several measures had missing data. Approximately 0.4% of

data was missing from the ADHD-RS-IV and 0.1% of data was missing from the BAARS-IV, AQ-C, and BAPQ. Higher rates of missing data were observed among the dependent variable measures, including 2.6%[1] of data missing from the PSI– 4–SF and 1.3% of data missing from the APQ (0.4% positive and involved parenting, 2.3% negative parenting practices). As such, unattempted or incomplete measures led to the exclusion of six participants from analyses involving the PSI– 4–SF, two participants from analyses involving the APQ (both APQ-PIP & APQ-NP), and an additional six participants from analyses involving the APQ-NP. Of note, at least five of these participants seemed to selectively skip negative parenting items on the APQ—particularly relating to poor supervision and monitoring—while still responding to positive and involved parenting items. Implications and resulting limitations of this finding are discussed further in the discussion.

Univariate Outliers

Univariate outliers were explored by examining standardized scores for all independent and dependent variables, where *z* scores > 3.29 were deemed potential outliers (Tabachnick & Fidell, 2019). Three potential outliers were identified, including one participant with a high score on the BAARS-IV and two participants with high scores on the APQ-NP. These outliers were not extreme relative to other participant responses and pose less of a concern given the large sample size, where a few standardized scores over 3.29 are expected (Tabachnick & Fidell, 2019). After reviewing the data for each of these potential outliers, the scores were deemed appropriate for the population being studied and the three participants were retained within the analysis.

[1] This percentage includes three participants who did not attempt the PSI– 4–SF and one participant who only completed the first half of the measure before discontinuing. Once these participants were removed, approximately 0.2% of data was missing from the PSI– 4–SF.

Multivariate Outliers

Several statistical measures were used to identify multivariate outliers for each of the twelve regression analyses, including Mahalanobis distance, Cook's *D*, and Leverage values. Based on these measures, one participant was highlighted as a multivariate outlier for research question 7, which involved a regression of pragmatic language difficulties as a predictor of negative parenting practices. While this participant had high Mahalanobis distance and Leverage scores, their Cook's *D* score was not problematic, suggesting that this outlier has low influence over the regression. To better understand the impact of retaining this participant, the regression analysis was run with and without this case. The results did not significantly differ between analyses. Additionally, a review of the data suggested that the collection of scores (including high scores on AQ-C, BAPQ, and PSI–4 –SF) was reflective of the underlying ASD population, and as such, the participant's data was retained in the analysis.

Assumptions Testing

As a final step in data preparation, the data was analyzed to explore key assumptions relating to multicollinearity, normality, linearity, and homoscedasticity. It is well acknowledged that violations of key assumptions underlying regression analysis can have a negative impact on inferences resulting from the regression, however, some have cautioned against overthinking minor violations of these assumptions as they are not always likely to be met (Hayes, 2018). Efforts were made to respect the implications of key assumptions without overemphasizing the impact of minor violations. To review figures that were used in the process of assumptions testing, see Appendix G.

Multicollinearity was assessed to ensure that independent variables were not highly correlated with each other, resulting in the inclusion of redundant variables. To assess for

multicollinearity, relationships between all independent variables were reviewed using the criteria proposed by Tabachnick and Fidell (2019), where correlations of .90 or higher suggest multicollinearity. No correlations surpassed this cut-off (see correlation matrix in Results) or were deemed problematic based on the variance inflation factor statistic (see Appendix H), and as such, all predictor variables were retained in the present analyses. Of note, the inclusion of an interaction term (BAP x ASD diagnostic status) resulted in high collinearity with corresponding BAP and ASD variables. There is some emphasis in the literature surrounding the need to mean-centre interaction variables to prevent potential issues caused by collinearity; however, Hayes (2018) has described this as a myth, noting that it is not a necessary step in moderation analysis and does not significantly impact the results of the analysis. As such, mean-centring was not used in the present study.

The second assumption evaluated concerns of multivariate normality, where the residuals (errors) are assumed to be normally distributed. Normality has been described as least important among the assumptions underlying linear regression analysis, with only severe violations being likely to impact the validity of the results in studies with moderate to large sample sizes (Hayes, 2018). Normality was assessed graphically by reviewing histograms (with a normal distribution overlay) and expected normal probability plots for each dependent variable, as formal inference tests are not advised for large sample sizes (Tabachnick & Fidell, 2019). While slight variations in skewness and kurtosis were observable, no severe violations of normality were noted (see Appendix G).

The assumption of linearity presumes that all variables within the model correlate with each other in an approximately linear nature (demonstrating a straight-line relationship). If violated, the regression may not effectively capture the relationship between variables. This

assumption was assessed graphically by reviewing bivariate relationships between variables plotted in a scatterplot matrix and by analyzing residual plots that compare standardized residuals to predicted values. No issues relating to linearity were observed (see Appendix G).

The final assumption concerns homoscedasticity, which requires constant variance in the residuals across all measured values. While minor violations are not considered concerning, severe violations can decrease the statistical power of hypothesis tests and influence the precision of regression coefficient confidence intervals (Hayes, 2018). The assumption of homoscedasticity was explored graphically by scanning residual plots that compare standardized residuals to predicted values. No severe violations were observed (see Appendix G).

Sample Characteristics

After examining eligibility among a larger sample of women who completed the online survey, a total of 143 North American mothers met criteria for inclusion in the present study. Further details regarding the geographic distribution of this sample can be found in Table 1.

Table 1

Location of Residence

	Son with ASD $n = 57$	Son without ASD $n = 86$	Total Sample $N = 143$
Location	*n (%)*	*n (%)*	*n (%)*
Canada	**48 (84.2)**	**78 (90.7)**	**126 (88.1)**
Alberta	3 (5.3)	1 (1.2)	4 (2.8)
British Columbia	11 (19.3)	8 (9.3)	19 (13.3)
Manitoba	20 (35.1)	54 (62.8)	74 (51.4)
New Brunswick	1 (1.8)	0	1 (0.7)

Nova Scotia	0	1 (1.2)	1 (0.7)
Nunavut	0	1 (1.2)	1 (0.7)
Ontario	2 (3.5)	8 (9.3)	10 (6.9)
Quebec	1 (1.8)	0	1 (0.7)
Saskatchewan	1 (1.8)	0	1 (0.7)
United States	**9 (15.5)**	**8 (9.3)**	**17 (11.9)**
Alabama	0	1 (1.2)	1 (0.7)
California	1 (1.8)	0	1 (0.7)
Colorado	0	1 (1.2)	1 (0.7)
Georgia	1 (1.8)	0	1 (0.7)
Maryland	0	1 (1.2)	1 (0.7)
Massachusetts	0	1 (1.2)	1 (0.7)
Michigan	1 (1.8)	0	1 (0.7)
Missouri	2 (3.5)	0	2 (1.4)
New York	0	1 (1.2)	1 (0.7)
Ohio	1 (1.8)	1 (1.2)	2 (1.4)
South Dakota	1 (1.8)	0	1 (0.7)
Tennessee	0	1 (1.2)	1 (0.7)
Texas	1 (1.8)	1 (1.2)	2 (1.4)
Utah	1 (1.8)	0	1 (0.7)

Note. 14 participants did not disclose province, territory, or state of residence.

Mothers in the total sample ranged in age from 24 to 49 years (M = 38.5, SD = 5.0). They primarily identified as White (74.1%), with a minority identifying as Black (8.4%), Asian (7.0%), Indigenous (4.2%), Latino (3.5%), or other (2.8%). The majority of mothers were married (74.1%) or in common-law partnerships (8.4%), while the remaining women identified

as separated/divorced (8.4%) or single (9.1%). Mothers had between 1 and 5 children (M = 2.3, SD = 1.0). Household income varied across participants, with mothers reporting annual household incomes under $40,000 (21.7%), $40,000 – $60,000 (12.6%), $60,000 – $90,000 (18.9%), $90,000 – $125,000 (23.8%), or above $125,000 (21.7%).

All participants had a biological son between 6 and 11 years of age, whom they considered while responding to survey questions. Sons had an average age of 106.5 months (SD = 21.2). The majority of mothers were primary caregivers who lived with their son seven days a week (97.9 %), while the remaining 2.1% of mothers lived with their son 6 days of week.[2] As determined by diagnostic screening criteria, 39.9% of the mothers had a son diagnosed with ASD (n = 57), while the remaining 60.1% of mothers had a son who was not diagnosed with ASD (n = 86). Additionally, 28.7% of mothers reported that their son had been diagnosed with attention-deficit hyperactivity disorder (n = 41). Additional demographic information—including demographic comparisons between mothers of sons with and without ASD—can be found in Table 2.

Table 2

Sample Characteristics

Characteristic	Son with ASD n = 57	Son without ASD n = 86	Total Sample N = 143
	M (SD)	*M (SD)*	*M (SD)*
Mother's Age (years)	40.0 (4.2)	37.5 (5.3)	38.5 (5.0)
Son's Age (months)	108.0 (19.5)	105.4 (22.3)	106.5 (21.2)
Number of Children	2.3 (1.1)	2.2 (0.9)	2.3 (1.0)
	n (%)	*n* (%)	*n* (%)

[2] One additional mother did not provide a response to this item.

Ethnicity			
White	44 (77.2)	62 (72.1)	106 (74.1)
Black	1 (1.8)	11 (12.8)	12 (8.4)
Asian	3 (5.3)	7 (8.1)	10 (7.0)
Indigenous	5 (8.8)	1 (1.2)	6 (4.2)
Latino	3 (5.3)	2 (2.3)	5 (3.5)
Other	1 (1.8)	3 (2.3)	4 (2.8)
Marital Status			
Married	40 (70.2)	66 (76.7)	106 (74.1)
Common-Law	4 (7.0)	8 (9.3)	12 (8.4)
Divorced/Separated	7 (12.3)	5 (5.8)	12 (8.4)
Single	6 (10.5)	7 (8.1)	13 (9.1)
Household Income			
< $40,000	10 (17.5)	21 (24.4)	31 (21.7)
$40, 000 - $60, 000	9 (15.8)	9 (10.5)	18 (12.6)
$60,000 - $90,000	16 (28.1)	11 (12.8)	27 (18.9)
$90,000 – $125,000	14 (24.6)	20 (23.3)	34 (23.8)
> $125,000	8 (14.0)	23 (26.7)	31 (21.7)
Recruitment Source			
Social Media	36 (63.2)	60 (69.8)	96 (67.1)
ASD Service Organization	13 (22.8)	0	13 (9.1)
University of Manitoba Subpool	0	15 (17.4)	15 (10.5)
Community Posting	1 (1.8)	2 (2.3)	3 (2.1)
Other	7 (12.3)	7 (8.1)	14 (9.8)
Maternal Diagnosis			
ASD	1 (1.8)	0	1 (0.7)

ADHD	4 (7.0)	2 (2.3)	6 (4.2)
Child Diagnosis			
ASD	57 (100)	0	57 (40.3)
ADHD	30 (52.6)	11 (12.8)	41 (28.7)

Note. ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder.

Descriptive Statistics

Descriptive statistics for key study variables—including statistical comparisons between mothers of sons with and without ASD—are outlined in Table 3. Independent sample *t*-tests were conducted to compare mothers of sons with and without ASD on key study variables. Levene's Test for Equality of Variances was used to ensure equal variances for both groups. The test indicated equality-of-variance across variables, with the exception of aloofness and BAP total scores. For these two variables, the *t* value for unequal variances was recorded.

Mothers of sons with ASD rated their sons as having significantly greater rates of ADHD and ASD symptomology. They also reported experiencing significantly higher parenting stress levels. Interestingly, mothers of sons with and without ASD did not significantly differ in their self-reported ratings of ADHD and BAP characteristics; although, differences in maternal rigidity ($p = .061$), pragmatic language difficulties ($p = .079$), and overall BAP ratings ($p = .062$) approached significance. They also did not significantly differ in parenting approaches, including ratings of positive and involved parenting and negative parenting practices.

Table 3

Descriptive Statistics

Variable	Son with ASD *n* = 57 *M (SD)*	Son without ASD *n* = 86 *M (SD)*	Total Sample *N* = 143 *M (SD)*	*t* Test	*p*
Age of Son (Months)	108.0 (19.5)	105.4 (22.3)	106.5 (21.2)	-0.71	.477
Child ADHD Symptoms[a]	33.8 (10.3)	15.5 (13.1)	22.8 (15.0)	-8.89*	<.001
Maternal ADHD Symptoms[b]	29.3 (7.8)	28.1 (8.9)	28.6 (8.5)	-0.80	.427
Child ASD Symptoms[c]	101.9 (13.3)	47.4 (14.0)	69.1 (30.0)	-23.28*	<.001
Maternal Aloofness[d]	3.0 (1.0)	2.8 (0.8)	2.9 (0.9)	-1.28	.205
Maternal Pragmatic Language Difficulties[d]	2.6 (0.7)	2.4 (0.6)	2.4 (0.7)	-1.77	.079
Maternal Rigidity[d]	3.1 (0.9)	2.9 (0.8)	3.0 (0.8)	-1.89	.061
Maternal BAP Total[d]	2.9 (0.8)	2.7 (0.5)	2.8 (0.6)	-1.89	.062
Positive/Involved Parenting[e]	67.4 (6.7)	67.7 (6.5)	67.6 (6.6)	0.27	.786
Negative Parenting Practices[e]	26.5 (6.8)	26.5 (5.8)	26.5 (6.2)	0.08	.939
Parenting Stress[f]	105.8 (23.1)	75.8 (25.6)	87.8 (28.6)	-6.96*	<.001

Note. $N = 143$ for all but positive/involved parenting ($N = 141$), negative parenting practices ($N = 135$), parenting stress ($N = 137$). ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder; BAP = Broader Autism Phenotype

[a]ADHD Rating Scale—IV; [b]Barkley Adult ADHD Rating Scale-IV; [c]Autism Spectrum Quotient—Child Version; [d]Broad Autism Phenotype Questionnaire; [e]Alabama Parenting Questionnaire; [f]Parenting Stress Index–4—Short Form.

*$p < .001$

Correlational Analyses

Correlations between all variables of interest were reviewed prior to conducting regression analyses. A matrix of the relationships between key variables can be found in Table 4. Relevant findings are outlined in greater detail below.

Significant relationships were found across mother and child diagnostic symptoms. Greater ASD symptomology in sons was significantly related to greater maternal BAP characteristics including rigidity, pragmatic language difficulties, and overall BAP ratings; although, child ASD symptoms were not significantly related to maternal aloofness. Greater son ASD symptomology was also associated with greater son ADHD symptomology, but not maternal ADHD symptomology. Conversely, higher ratings of child ADHD symptoms corresponded with greater maternal ADHD symptomology and BAP characteristics including rigidity, pragmatic language difficulties, and overall BAP ratings, but did not significantly correlate with maternal aloofness. Lastly, higher levels of maternal ADHD symptomology were related to increased maternal BAP characteristics across all domains.

Parenting outcome variables were also significantly related to mother and child characteristics. Most notably, greater maternal BAP characteristics (i.e., aloofness, pragmatic language difficulties, and overall BAP characteristics) were significantly related to decreases in positive and involved parenting and increases in negative parenting practices. Interestingly, rigidity was not related to positive and involved parenting but did correspond with increased negative parenting practices. Greater use of negative parenting practices was also significantly related to increases in maternal and child ADHD symptomology. Of note, parenting behaviours (positive or negative) were not significantly related to child ASD symptomology.

Parenting stress was significantly related to all study variables with the exception of child age. Higher levels of parenting stress corresponded with increases in maternal and child ADHD symptomology, child ASD symptomology, and maternal BAP characteristics. Additionally, greater parenting stress was significantly correlated with lower levels of positive and involved parenting and higher levels of negative parenting practices.

Child age demonstrated small but significant correlations with maternal ADHD symptoms and maternal aloofness. More specifically, increased child age corresponded with lower levels of ADHD symptomology and aloofness. Child age was not significantly related to any other independent or dependent variable.

Table 4

Correlation Matrix

Measure	1	2	3	4	5	6	7	8	9	10	11
1. Age of Son	-	-.035	-.169*	.056	-.058	-.035	-.169*	-.111	-.111	.133	-.007
2. Child ADHD Symptoms[a]		-	.310***	.654***	.134	.202*	.198*	.214*	-.083	.215*	.649***
3. Maternal ADHD Symptoms[b]			-	.123	.247**	.565***	.265**	.416***	-.075	.190*	.286**
4. Child ASD Symptoms[c]				-	.144	.232**	.236**	.245**	-.092	.078	.606***
5. Maternal Aloofness[d]					-	.550***	.551***	.870***	-.197*	.230**	.276**
6. Maternal Pragmatic Language Difficulties[d]						-	.415***	.765***	-.310***	.330***	.391***
7. Maternal Rigidity[d]							-	.817***	-.136	.225**	.316***
8. Maternal BAP Total[d]								-	-.253**	.318***	.392***
9. Positive/Involved Parenting[e]									-	-.399***	-.413***
10. Negative Parenting Practices[e]										-	.447***
11. Parenting Stress[f]											-

Note. $N = 143$ for all but positive/involved parenting ($N = 141$), negative parenting practices ($N = 135$), parenting stress ($N = 137$). ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder; BAP = Broader Autism Phenotype

[a]ADHD Rating Scale—IV; [b]Barkley Adult ADHD Rating Scale-IV; [c]Autism Spectrum Quotient—Child Version; [d]Broad Autism Phenotype Questionnaire; [e]Alabama Parenting Questionnaire; [f]Parenting Stress Index–4—Short Form.

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

Moderation Analyses

Twelve moderation analyses were conducted using regression to investigate the relationship between maternal BAP characteristics (rigidity, aloofness, pragmatic language difficulties, and total BAP), child ASD diagnosis (1 = ASD group, 0 = comparison group), and parenting outcomes (positive and involved parenting, negative parenting practices, parenting stress). More specifically, multiple regression was used to determine whether child ASD status [M]—a dichotomous variable grouping mothers based on whether or not their son had ASD—moderated the relationship between maternal ratings of:

1. Rigidity [IV1] and use of positive/involved parenting practices [DV1]
2. Aloofness [IV2] and use of positive/involved parenting practices [DV1]
3. Pragmatic language difficulties [IV3] and use of positive/involved parenting practices [DV1]
4. Total BAP characteristics [IV4] and use of positive/involved parenting practices [DV1]
5. Rigidity [IV1] and use of negative parenting practices [DV2]
6. Aloofness [IV2] and use of negative parenting practices [DV2]
7. Pragmatic language difficulties [IV3] and use of negative parenting practices [DV2]
8. Total BAP characteristics [IV4] and use of negative parenting practices [DV2]
9. Rigidity [IV1] and levels of parenting stress [DV3]
10. Aloofness [IV2] and levels of parenting stress [DV3]
11. Pragmatic language difficulties [IV3] and levels of parenting stress [DV3]
12. Total BAP characteristics [IV4] and levels of parenting stress [DV3]

This regression-based approach to moderation analysis is similar to previous similarity-fit research (e.g., Johnston et al., 2016; Psychogiou et al., 2007, Psychogiou et al., 2008); although,

hierarchical regression was not incorporated in the present study as hierarchical entry is not necessary for testing moderation hypotheses and ultimately produces the same interaction result (Hayes, 2018). Additionally, all 12 moderation analyses controlled for child age, child ADHD symptomology, and maternal ADHD symptomology as covariates. These analyses were conducted using Model 1 in PROCESS Version 3.5 for IBM SPSS Statistics (Hayes 2018, IBM Corp, 2019). See Figure 1 for a conceptual diagram of this model.

Figure 1

Moderation Model 1 – Conceptual Diagram

This item has been removed to ensure copyright compliance. To view Model 1, refer to its source.

Note. This conceptual diagram was adapted from Moderation Model 1 as outlined in *Introduction to Mediation, Moderation, and Conditional Process Analysis, Second Edition: A Regression-Based Approach* by Andrew F. Hayes. Copyright © 2018 The Guilford Press. X = predictor variable (i.e., rigidity, aloofness, pragmatic language difficulties, or overall BAP characteristics), M = moderator (child ASD status), Y = outcome variables (i.e., positive and involved parenting, negative parenting practices, or parenting stress), and CV = covariate (child age, child ADHD symptomology, and maternal ADHD symptomology).

Research Question 1: Maternal Rigidity as a Predictor of Positive and Involved Parenting

Results of this moderation analysis are presented in Table 5. Collectively, maternal rigidity, child ASD, and covariate predictors (i.e., child age, child ADHD, maternal ADHD) did not account for significant variability in positive and involved parenting practices, $F(6, 134) = 1.02$, $p = .412$, $R^2 = .04$. Accordingly, no significant main effects were observed among the individual predictor variables (see Table 5). The addition of the interaction between maternal rigidity and child ASD also did not provide a significant change to the model, $F(1,134) = 0.00$, $p = .952$, $\Delta R^2 = .00$. For visual illustrations of the relationships among these variables, refer to the statistical diagram provided in Figure 2 and the graphical representation provided in Figure 3.

Table 5

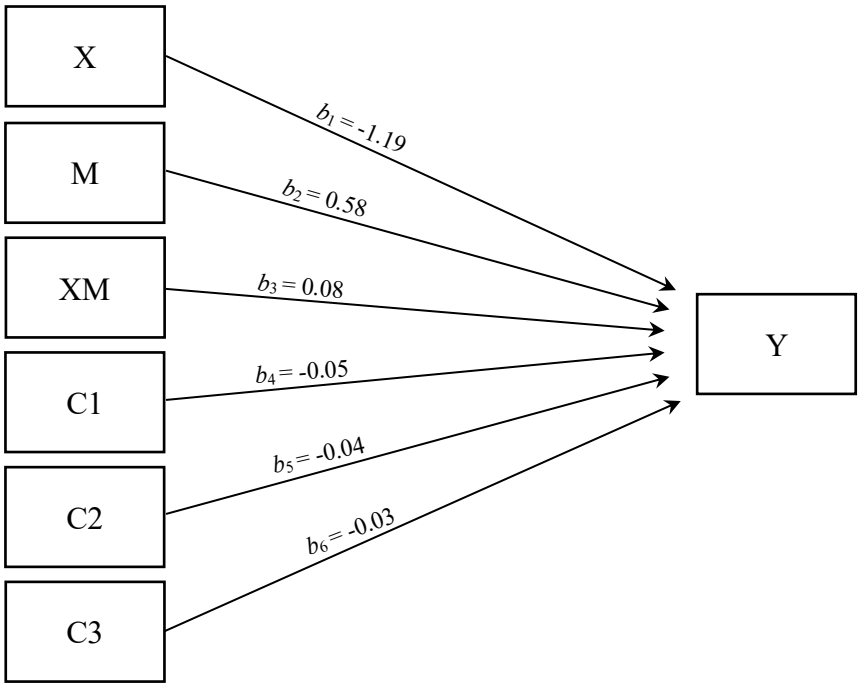
Research Question 1 – Rigidity & Positive and Involved Parenting

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	77.253	4.639	16.652	<.001	68.077, 86.428
Maternal Rigidity (X)	-1.189	1.009	-1.178	.241	-3.182, 0.807
Child ASD Status (M)	0.584	4.470	0.131	.896	-8.257, 9.425
Rigidity * ASD (XM)	0.084	1.393	0.060	.952	-2.671, 2.839
Child Age (C1)	-0.045	0.027	-1.674	.097	-0.099, 0.008
Child ADHD (C2)	-0.037	0.049	-0.756	.451	-0.135, 0.060
Maternal ADHD (C3)	-0.029	0.073	-0.399	.690	-0.173, 0.115

Note. $N = 141$. ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder.

Figure 2

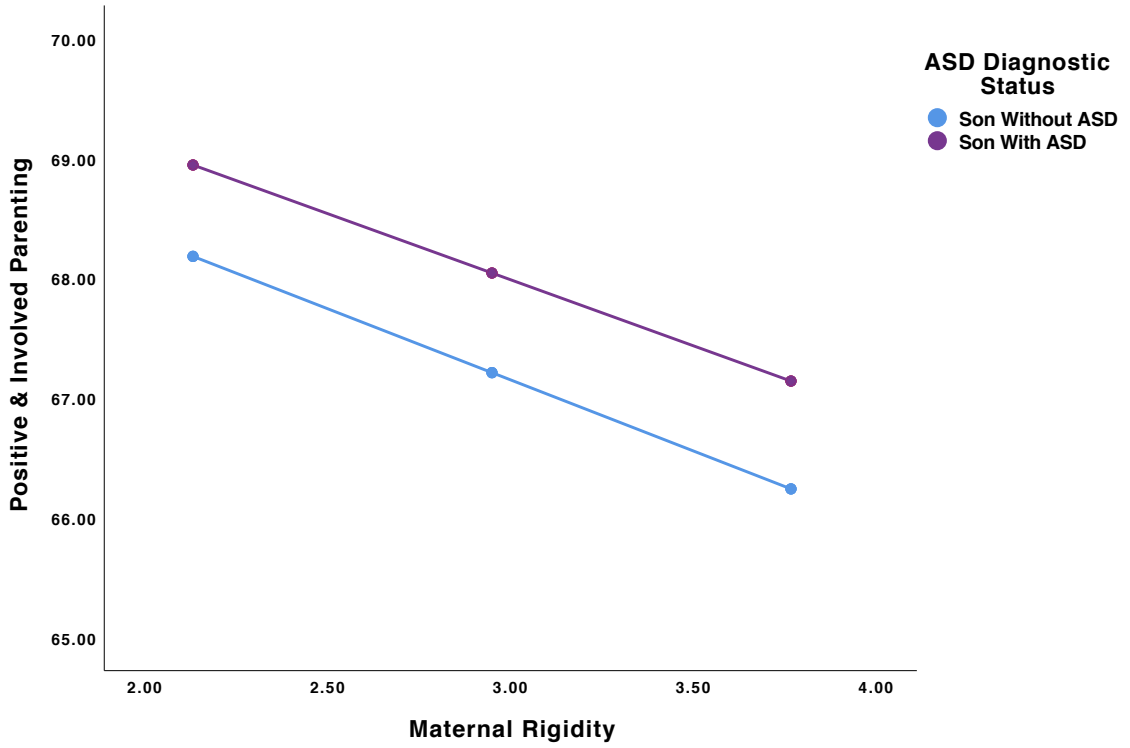
Research Question 1 – Statistical Diagram



Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal rigidity on positive and involved parenting by child ASD status. X = maternal rigidity, M = child ASD status, Y = positive and involved parenting, C1 = child age, C2 = child ADHD, and C3 = maternal ADHD.

Figure 3

Research Question 1 – Graph with Fit Line



Note. A graphical representation of the effect of maternal rigidity on positive and involved parenting by child ASD status.

Research Question 2: Maternal Aloofness as a Predictor of Positive and Involved Parenting

Results of this moderation analysis are presented in Table 6. Collectively, maternal aloofness, child ASD, and covariate predictors (i.e., child age, child ADHD, maternal ADHD) did not account for significant variability in positive and involved parenting practices, $F(6, 134) = 1.48$, $p = .190$, $R^2 = .06$. Accordingly, no significant main effects were observed among these variables (see Table 6). Of note, maternal aloofness was approaching significance ($b = -1.81$, $p = .060$), where mothers reporting greater levels of aloofness were less likely to use positive and

involved parenting practices. The addition of the interaction between maternal aloofness and child ASD did not provide a significant change to the model, $F(1,134) = 0.22$, $p = .637$, $\Delta R^2 = .00$. For visual illustrations of the relationships among these variables, refer to the statistical diagram provided in Figure 4 and the graphical representation provided in Figure 5.

Table 6

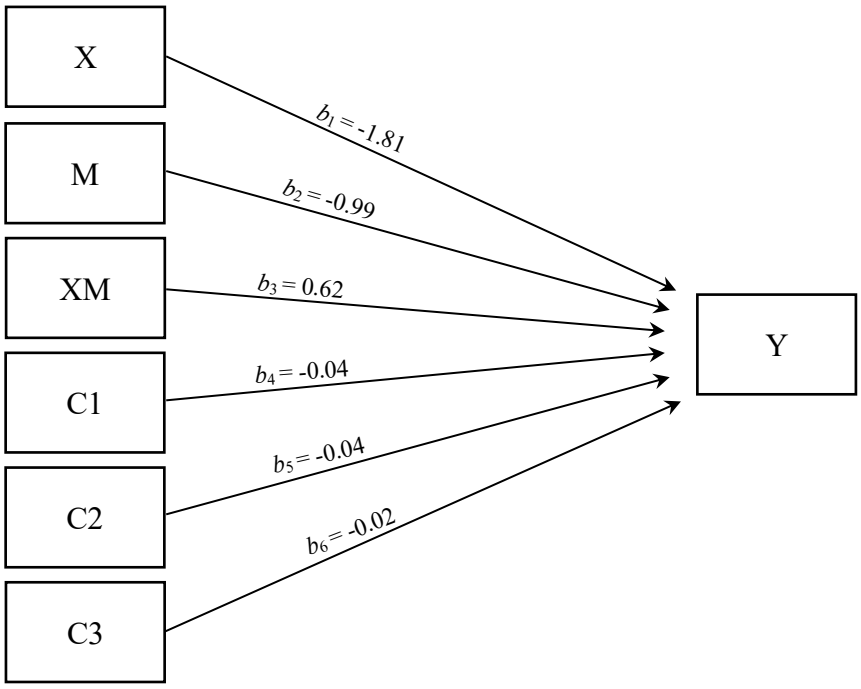
Research Question 2 – Aloofness & Positive and Involved Parenting

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	78.28	4.49	17.42	<001	69.39, 87.17
Maternal Aloofness (X)	-1.81	0.96	-1.89	.060	-3.70, 0.08
Child ASD Status (M)	-0.99	4.15	-0.24	.813	-9.19, 7.22
Aloofness * ASD (XM)	0.62	1.32	0.47	.637	-1.98, 3.23
Child Age (C1)	-0.04	0.03	-1.54	.125	-0.09, 0.01
Child ADHD (C2)	-0.04	0.05	-0.78	.439	-0.14, 0.06
Maternal ADHD (C3)	-0.02	0.07	-0.30	.767	-0.17, 0.12

Note. $N = 141$. ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder.

Figure 4

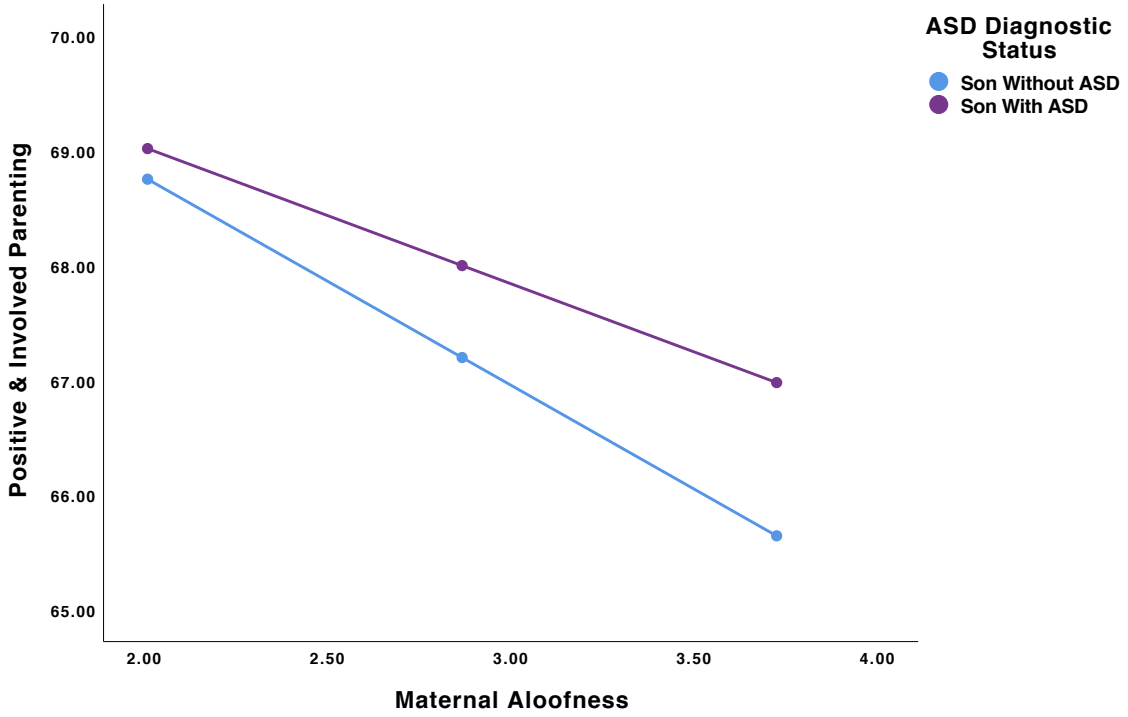
Research Question 2 – Statistical Diagram



Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal aloofness on positive and involved parenting by child ASD status. X = maternal aloofness, M = child ASD status, Y = positive and involved parenting, C1 = child age, C2 = child ADHD, and C3 = maternal ADHD.

Figure 5

Research Question 2 – Graph with Fit Line



Note. A graphical representation of the effect of maternal aloofness on positive and involved parenting by child ASD status.

Research Question 3: Maternal Pragmatic Language Difficulties as a Predictor of Positive and Involved Parenting

Results of this moderation analysis are presented in Table 7. The model was significant, $F(6, 134) = 3.31$, $p = .005$, with maternal pragmatic language difficulties, child ASD, and control variables (i.e., child age, child ADHD, maternal ADHD) accounting for 13% of the variance in positive and involved parenting practices ($R^2 = .13$). Of note, pragmatic language difficulties was the only significant predictor variable in this model ($b = -4.04$, $p = .002$). Mothers reporting

greater difficulties with pragmatic language were less likely to use positive and involved parenting practices. No other significant main effects were observed (see Table 7). Contrary to initial hypotheses, the interaction between maternal pragmatic language difficulties and child ASD was not significant, $F(1,134) = 0.02$, $p = .897$, $\Delta R^2 = .00$. For visual illustrations of the relationships among these variables, refer to the statistical diagram provided in Figure 6 and the graphical representation provided in Figure 7.

Table 7

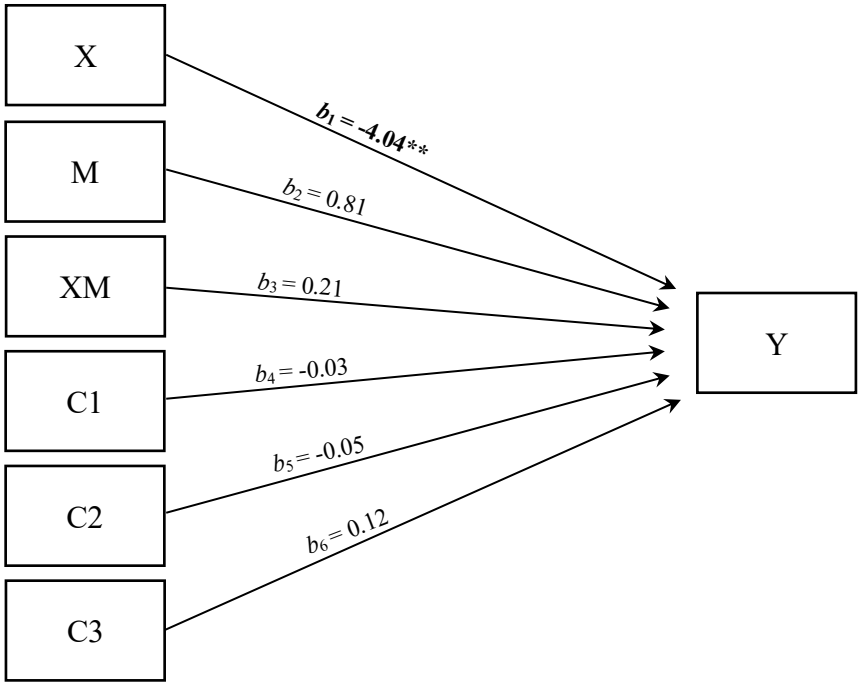
Research Question 3 – Pragmatic Language Difficulties & Positive and Involved Parenting

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	78.04	4.17	18.72	<.001	69.79, 86.28
Maternal PLD (X)	-4.04	1.27	-3.17	.002	-6.56, -1.52
Child ASD Status (M)	0.81	4.27	0.19	.851	-7.65, 9.26
PLD * ASD (XM)	0.21	1.64	0.13	.897	-3.03, 3.46
Child Age (CV1)	-0.03	0.03	-1.29	.200	-0.08, 0.18
Child ADHD (CV2)	-0.05	0.05	-1.07	.286	-0.14, 0.04
Maternal ADHD (CV3)	0.12	0.08	1.52	.130	-0.04, 0.28

Note. $N = 141$. PLD = pragmatic language difficulties; ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder.

Figure 6

Research Question 3 – Statistical Diagram

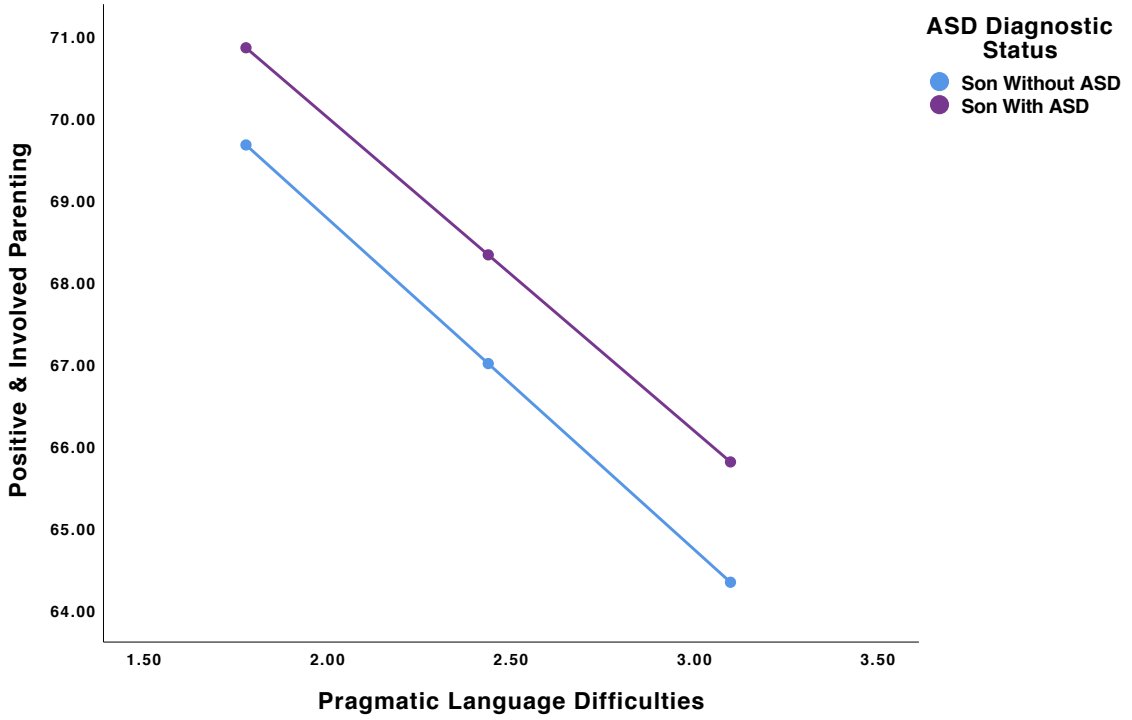


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal pragmatic language difficulties on positive and involved parenting by child ASD status. X = maternal pragmatic language difficulties, M = child ASD status, Y = positive and involved parenting, C1 = child age, C2 = child ADHD, and C3 = maternal ADHD.

$^{**}p < .01$

Figure 7

Research Question 3 – Graph with Fit Line



Note. A graphical representation of the effect of maternal pragmatic language difficulties on positive and involved parenting by child ASD status.

Research Question 4: Maternal BAP Characteristics (Overall) as a Predictor of Positive and Involved Parenting

Results of this moderation analysis are presented in Table 8. The model was significant, $F(6, 134) = 2.29$, $p = .039$, with maternal BAP characteristics, child ASD, and control variables (i.e., child age, child ADHD, maternal ADHD) accounting for 9% of the variance in positive and involved parenting practices ($R^2 = .09$). Of note, BAP was the only significant predictor variable in this model ($b = -3.74$, $p = .009$). Mothers with increased BAP characteristics were less likely to use positive and involved parenting practices. No other significant main effects were observed

(see Table 8). Conflicting with initial hypotheses, the interaction between maternal BAP characteristics and child ASD was not significant, $F(1,134) = 0.66$, $p = .419$, $\Delta R^2 = .00$. For visual illustrations of the relationships among these variables, refer to the statistical diagram provided in Figure 8 and the graphical representation provided in Figure 9.

Table 8

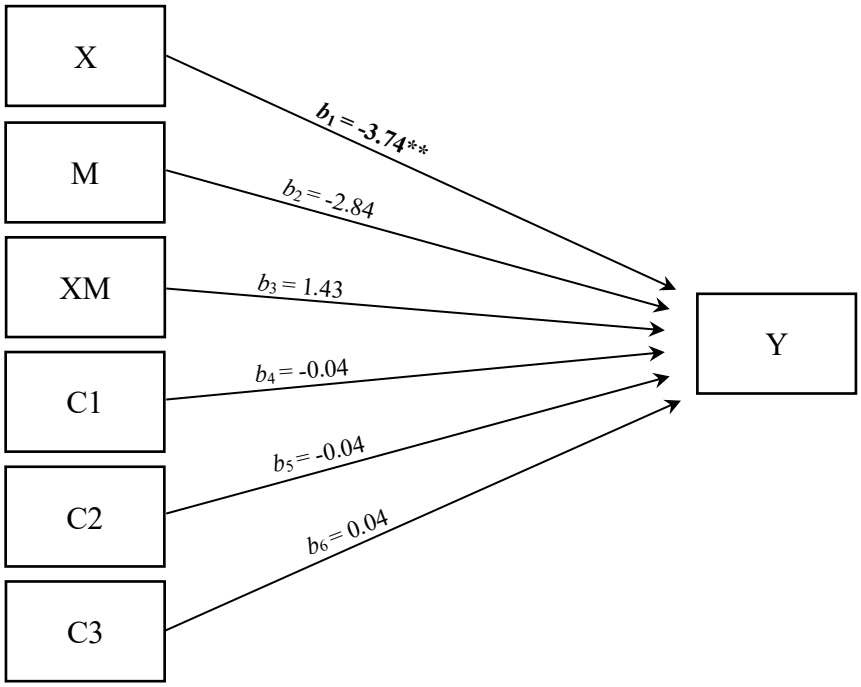
Research Question 4 – Total BAP & Positive and Involved Parenting

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	81.86	4.92	16.65	<.001	72.13, 91.58
Maternal BAP (X)	-3.74	1.42	-2.64	.009	-6.53, -0.94
Child ASD Status (M)	-2.84	5.14	-0.55	.581	-13.00, 7.32
BAP * ASD (XM)	1.43	1.76	0.81	.419	-2.01, 4.92
Child Age (CV1)	-0.04	0.03	-1.68	.096	-0.10, 0.01
Child ADHD (CV2)	-0.04	0.05	-0.77	.440	-0.13, 0.06
Maternal ADHD (CV3)	0.04	0.08	0.47	.638	-0.11, 0.18

Note. $N = 141$. ASD = autism spectrum disorder; BAP = broader autism phenotype; ADHD = attention-deficit/hyperactivity disorder.

Figure 8

Research Question 4 – Statistical Diagram

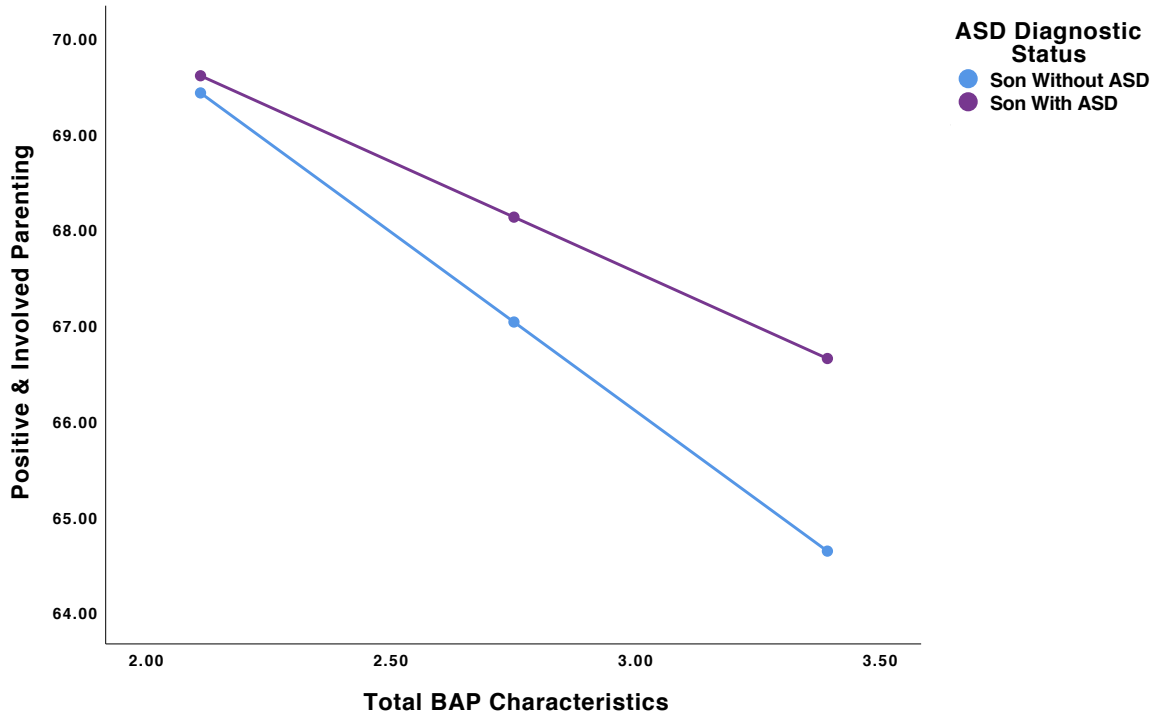


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal BAP characteristics on positive and involved parenting by child ASD status. X = maternal BAP total, M = child ASD status, Y = positive and involved parenting, C1 = child age, C2 = child ADHD, and C3 = maternal ADHD.

$^{**}p < .01$

Figure 9

Research Question 4 – Graph with Fit Line



Note. A graphical representation of the effect of maternal BAP characteristics on positive and involved parenting by child ASD status.

Research Question 5: Maternal Rigidity as a Predictor of Negative Parenting Practices

Results of this moderation analysis are presented in Table 9. The model was significant, $F(6, 128) = 3.95$, $p = .001$, with maternal rigidity, child ASD, and control variables (i.e., child age, child ADHD, maternal ADHD) accounting for 16% of the variance in negative parenting practices ($R^2 = .16$). Maternal rigidity, child ASD, and their interaction were not significant predictors of negative parenting practices (see Table 9). In contrast to initial hypotheses, the addition of the interaction between maternal rigidity and child ASD did not provide a significant change to the model, $F(1,128) = 0.20$, $p = .657$, $\Delta R^2 = .00$. Among the covariates, maternal

ADHD was not a significant predictor, but child ADHD symptomology ($b = 0.11$, $p = .012$) and child age ($b = 0.06$, $p = .012$) were significant. Mothers of sons who were older in age and mothers of sons with higher ADHD symptom ratings endorsed greater use of negative parenting practices. For visual illustrations of the relationships among these variables, refer to the statistical diagram provided in Figure 10 and the graphical representation provided in Figure 11.

Table 9

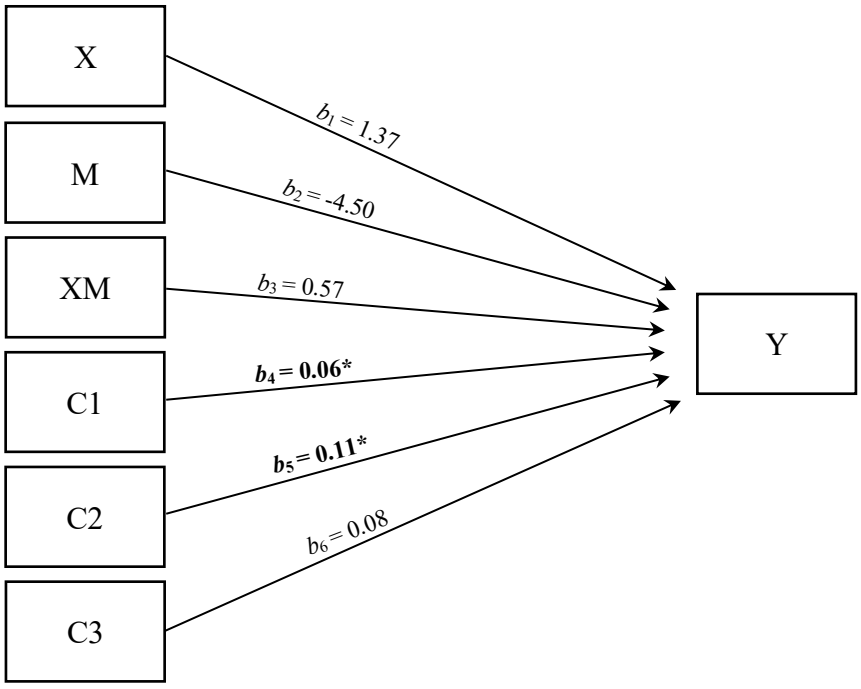
Research Question 5 – Rigidity & Negative Parenting Practices

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	12.07	4.23	2.85	.005	3.70, 20.45
Maternal Rigidity (X)	1.37	0.89	1.54	.126	-0.39, 3.14
Child ASD Status (M)	-4.50	4.07	-1.10	.271	-12.55, 3.56
Rigidity * ASD (XM)	0.57	1.29	0.45	.657	-1.98, 3.13
Child Age (CV1)	0.06	0.02	2.55	.012	0.01, 0.11
Child ADHD (CV2)	0.11	0.05	2.54	.012	0.02, 0.20
Maternal ADHD (CV3)	0.08	0.07	1.13	.261	-0.06, 0.21

Note. $N = 135$. ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder.

Figure 10

Research Question 5 – Statistical Diagram

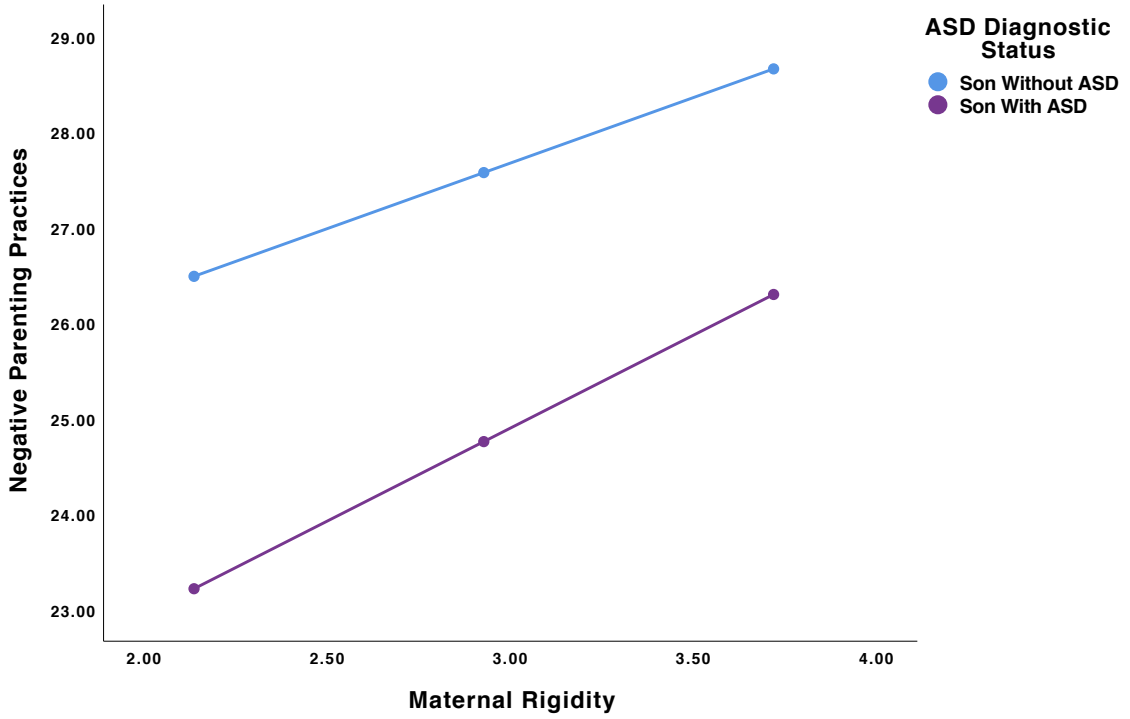


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal rigidity on negative parenting practices by child ASD status. X = maternal rigidity, M = child ASD status, Y = negative parenting practices, C1 = child age, C2 = child ADHD, and C3 = maternal ADHD.

*$p < .05$

Figure 11

Research Question 5 – Graph with Fit Line



Note. A graphical representation of the effect of maternal rigidity on negative parenting practices by child ASD status.

Research Question 6: Maternal Aloofness as a Predictor of Negative Parenting Practices

Results of this moderation analysis are presented in Table 10. The model was significant, $F(6, 128) = 4.33$, $p < .001$, with maternal aloofness, child ASD, and control variables (i.e., child age, child ADHD, maternal ADHD) accounting for 17% of the variance in negative parenting practices ($R^2 = .17$). Child ASD was a significant predictor of negative parenting practices ($b = -7.66$, $p = .047$), where mothers of sons without ASD reported greater use of negative parenting practices than mothers of sons with ASD. Neither maternal aloofness, nor the interaction between aloofness and child ASD, were significant predictors (see Table 10).

Conflicting with initial hypotheses, the addition of the interaction between maternal aloofness and child ASD did not result in a significant change to the model, $F(1,128) = 1.91$, $p = .169$, $\Delta R^2 = .01$. Among the covariates, maternal ADHD was not a significant predictor, but child ADHD symptomology ($b = 0.13$, $p = .005$) and child age ($b = 0.06$, $p = .012$) were significant. Mothers of sons who were older in age and mothers of sons with higher ADHD symptom ratings endorsed greater use of negative parenting practices. For visual illustrations of the relationships among these variables, refer to the statistical diagram provided in Figure 12 and the graphical representation provided in Figure 13.

Table 10

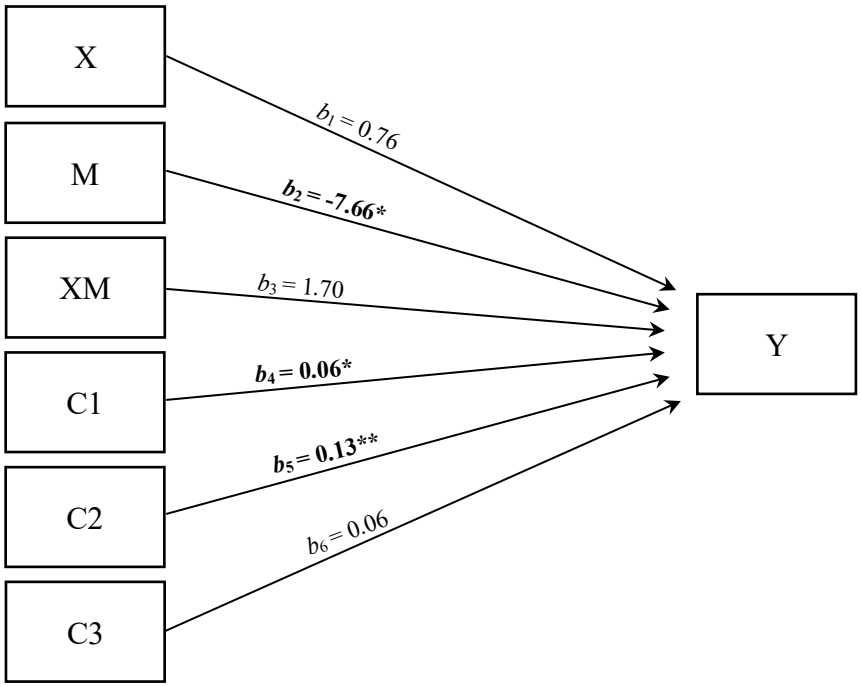
Research Question 6 – Aloofness & Negative Parenting Practices

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	12.51	4.11	3.53	<.001	6.37, 22.65
Maternal Aloofness (X)	0.76	0.85	0.89	.376	-0.93, 2.44
Child ASD Status (M)	-7.66	3.81	-2.01	.047	-15.19, -0.12
Aloofness * ASD (XM)	1.70	1.23	1.38	.169	-0.73, 4.13
Child Age (CV1)	0.06	0.02	2.40	.018	0.01, 0.11
Child ADHD (CV2)	0.13	0.04	2.84	.005	0.04, 0.21
Maternal ADHD (CV3)	0.06	0.07	0.94	.351	-0.07, 0.20

Note. $N = 135$. ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder.

Figure 12

Research Question 6 – Statistical Diagram

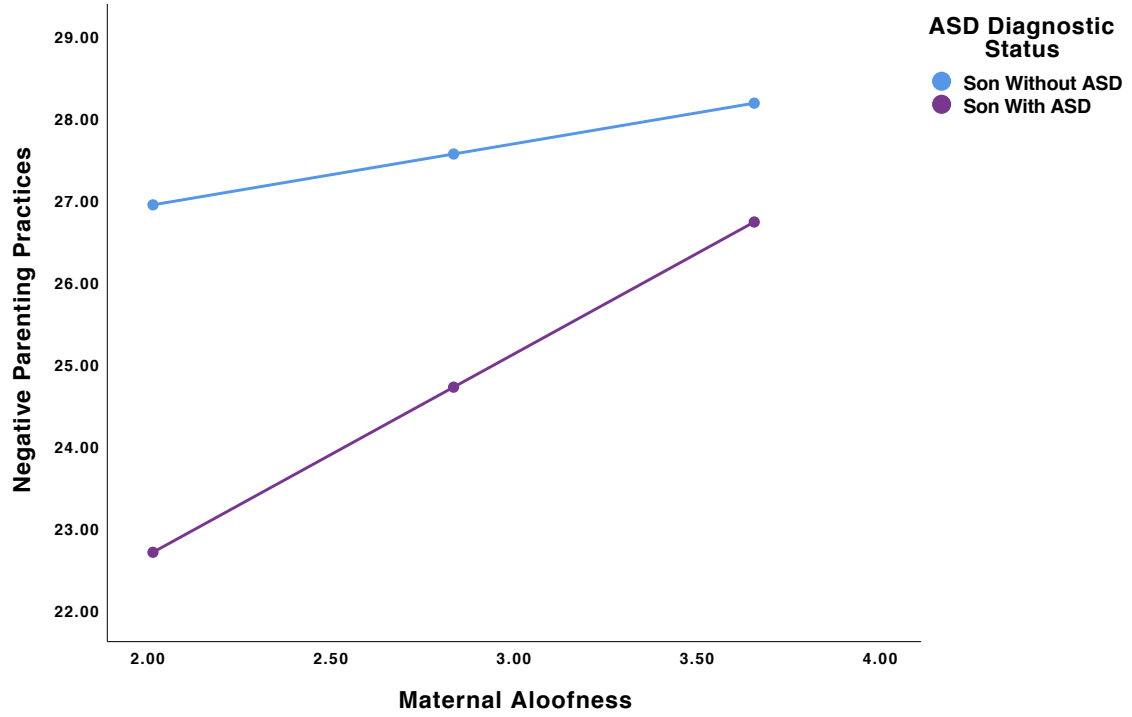


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal aloofness on negative parenting practices by child ASD status. X = maternal aloofness, M = child ASD status, Y = negative parenting practices, C1 = child age, C2 = child ADHD, and C3 = maternal ADHD.

$^{*}p < .05$, $^{**}p < .01$

Figure 13

Research Question 6 – Graph with Fit Line



Note. A graphical representation of the effect of maternal aloofness on negative parenting practices by child ASD status.

Research Question 7: Maternal Pragmatic Language Difficulties as a Predictor of Negative Parenting Practices

Results of this moderation analysis are presented in Table 11. The model was significant, $F(6, 128) = 5.43$, $p < .001$, with maternal pragmatic language difficulties, child ASD, and control variables (i.e., child age, child ADHD, maternal ADHD) accounting for 20% of the variance in negative parenting practices ($R^2 = .20$). Child ASD was a significant predictor of negative parenting practices ($b = -8.01$, $p = .044$), where mothers of sons without ASD reported greater use of negative parenting practices than mothers of sons with ASD. Maternal pragmatic language

difficulties was approaching significance (b = 2.22, p = .056), with greater difficulties in pragmatic language predicting greater negative parenting practices. In contrast to initial hypotheses, the addition of the interaction between maternal pragmatic language difficulties and child ASD did not result in a significant change to the model, $F(1,128) = 1.79$, p = .183, ΔR^2 = .01. Among the covariates, maternal ADHD was not a significant predictor, but child ADHD symptomology (b = 0.13, p = .003) and child age (b = 0.05, p = .045) were significant. Mothers of older sons and mothers of sons with higher ADHD symptom ratings endorsed greater use of negative parenting practices. For visual illustrations of the relationships among these variables, refer to the statistical diagram provided in Figure 14 and the graphical representation provided in Figure 15.

Table 11

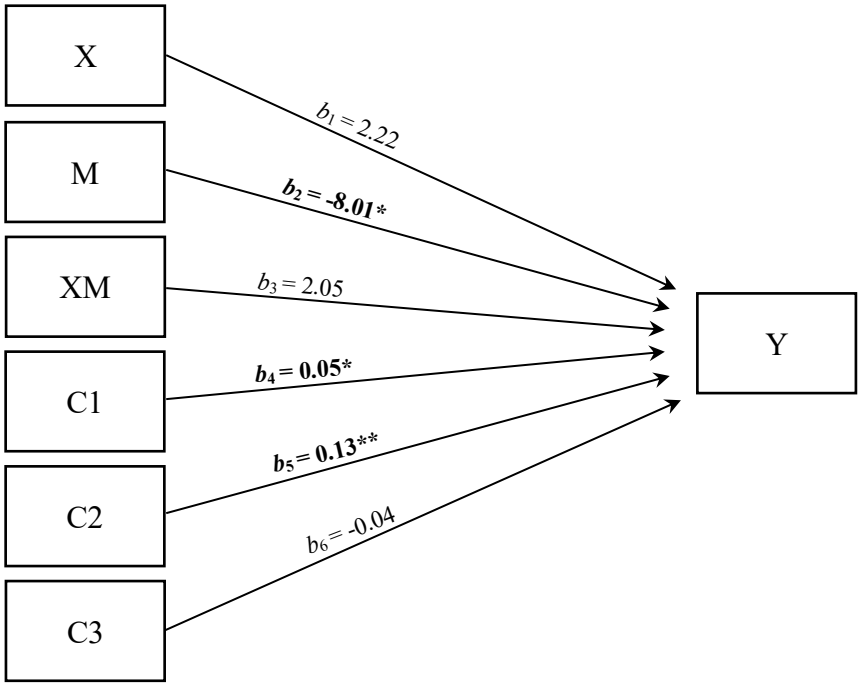
Research Question 7 – Pragmatic Language Difficulties & Negative Parenting Practices

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	15.14	3.83	3.95	<.001	7.56, 22.72
Maternal PLD (X)	2.22	1.15	1.93	.056	-0.05, 4.49
Child ASD Status (M)	-8.01	3.93	-2.04	.044	-15.80, -0.23
PLD * ASD (XM)	2.05	1.53	1.34	.183	-0.98, 5.07
Child Age (CV1)	0.05	0.02	2.02	.045	0.00, 0.10
Child ADHD (CV2)	0.13	0.04	3.03	.003	0.05, 0.22
Maternal ADHD (CV3)	-0.04	0.08	-0.46	.645	-0.18, 0.11

Note. N = 135. PLD = pragmatic language difficulties; ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder

Figure 14

Research Question 7 – Statistical Diagram

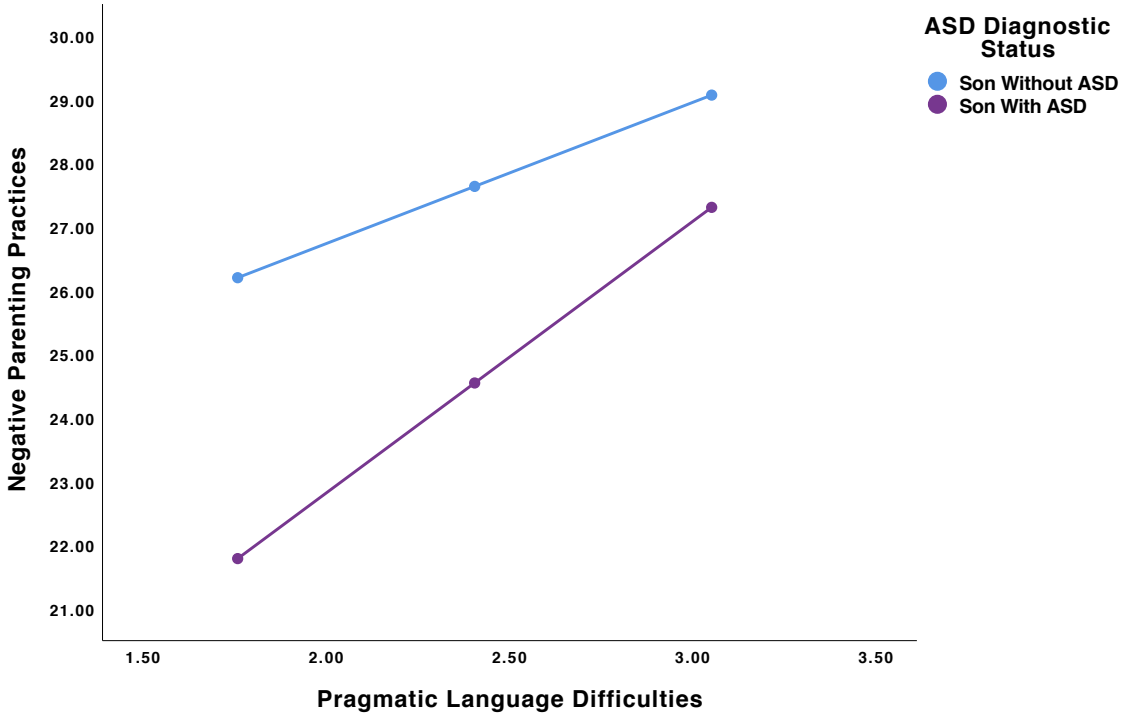


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal pragmatic language difficulties on negative parenting practices by child ASD status. X = maternal pragmatic language difficulties, M = child ASD status, Y = negative parenting practices, C1 = child age, C2 = child ADHD, and C3 = maternal ADHD.

$^{*}p < .05$, $^{**}p < .01$

Figure 15

Research Question 7 – Graph with Fit Line



Note. A graphical representation of the effect of maternal pragmatic language difficulties on negative parenting practices by child ASD status.

Research Question 8: Maternal BAP Characteristics (Overall) as a Predictor of Negative Parenting Practices

Results of this moderation analysis are presented in Table 12. The model was significant, $F(6, 128) = 5.18$, $p < .001$, with maternal BAP characteristics, child ASD, and control variables (i.e., child age, child ADHD, maternal ADHD) accounting for 20% of the variance in negative parenting practices ($R^2 = .20$). Maternal BAP, child ASD, and their interaction were not significant predictors of negative parenting practices (see Table 12); although, BAP characteristics approached significance as a predictor ($b = 2.40$, $p = .060$), where mothers with

greater BAP characteristics were more likely to report use of negative parenting practices. Against initial hypotheses, the addition of the interaction between maternal BAP characteristics and child ASD did not result in a significant change to the model, $F(1,128) = 0.57$, $p = .452$, $\Delta R^2 = .00$. Among the covariates, maternal ADHD was not a significant predictor, but child ADHD symptomology ($b = 0.12$, $p = .007$) and child age ($b = 0.06$, $p = .013$) were significant. Mothers of older sons and mothers of sons with higher ADHD symptom ratings endorsed greater use of negative parenting practices. For visual illustrations of the relationships among these variables, refer to the statistical diagram provided in Figure 16 and the graphical representation provided in Figure 17.

Table 12

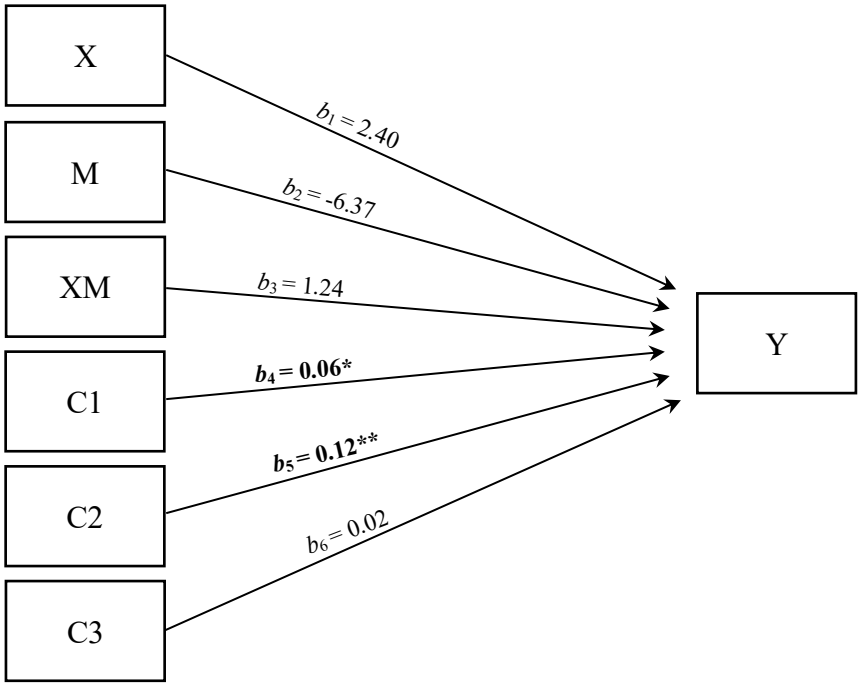
Research Question 8 – Total BAP & Negative Parenting Practices

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	11.28	4.48	2.52	.013	2.41, 20.15
Maternal BAP (X)	2.40	1.26	1.90	.060	-0.10, 4.89
Child ASD Status (M)	-6.37	4.71	-1.35	.179	-15.70, 2.95
BAP * ASD (XM)	1.24	1.64	0.75	.452	-2.01, 4.48
Child Age (CV1)	0.06	0.02	2.52	.013	0.01, 0.11
Child ADHD (CV2)	0.12	0.04	2.73	.007	0.03, 0.21
Maternal ADHD (CV3)	0.02	0.07	0.32	.746	-0.11, 0.16

Note. $N = 135$. BAP = broader autism phenotype; ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder

Figure 16

Research Question 8 – Statistical Diagram

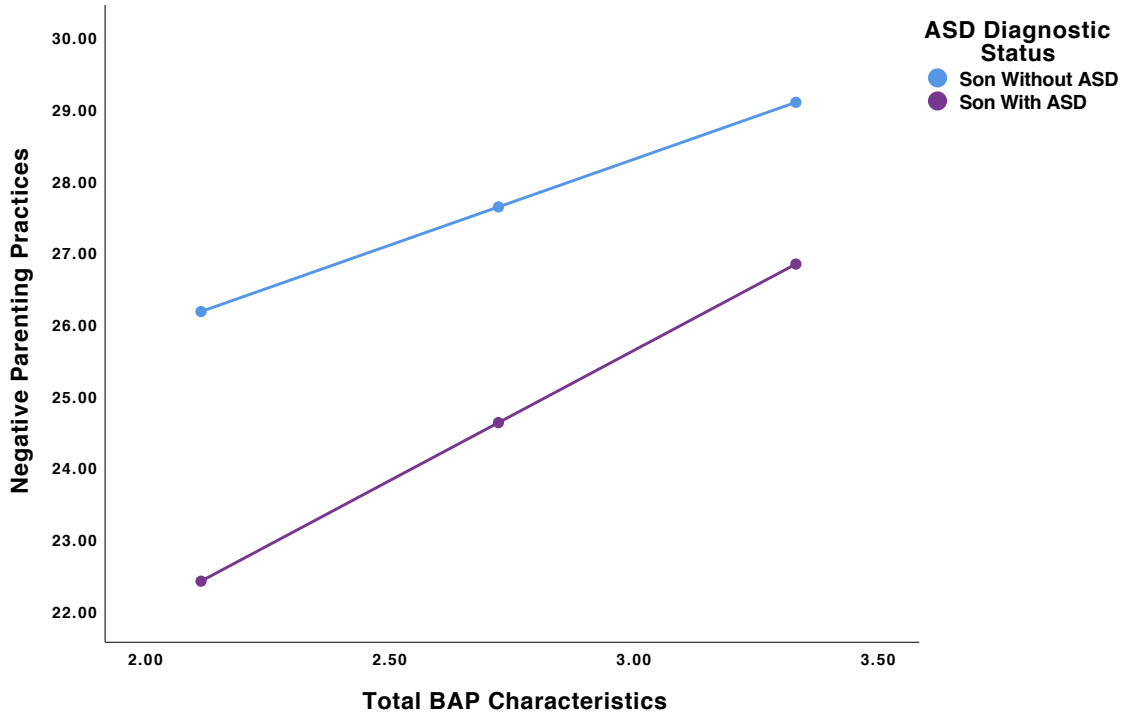


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal BAP characteristics on negative parenting practices by child ASD status. X = maternal BAP characteristics, M = child ASD status, Y = negative parenting practices, C1 = child age, C2 = child ADHD, and C3 = maternal ADHD.

$^{*}p < .05$, $^{**}p < .01$

Figure 17

Research Question 8 – Graph with Fit Line



Note. A graphical representation of the effect of maternal BAP characteristics on negative parenting practices by child ASD status.

Research Question 9: Maternal Rigidity as a Predictor of Parenting Stress

Results of this moderation analysis are presented in Table 13. The model was significant, $F(6, 130) = 20.87$, $p < .001$, with maternal rigidity, child ASD, and control variables (i.e., child age, child ADHD, maternal ADHD) accounting for 49% of the variance in parenting stress ($R^2 = .49$). When looking at main effects, child ADHD was the only significant predictor of parenting stress ($b = 0.91$, $p < .001$), where increases in sons' ADHD symptomology corresponded with increases in mothers' parenting stress. No other predictor variables or covariates were significant (see Table 13). Contrary to initial hypotheses, the addition of the interaction between maternal

rigidity and child ASD did not result in a significant change to the model, $F(1,130) = 0.76$, $p = .385$, $\Delta R^2 = .00$. For visual illustrations of the relationships among these variables, refer to the statistical diagram provided in Figure 18 and the graphical representation provided in Figure 19.

Table 13

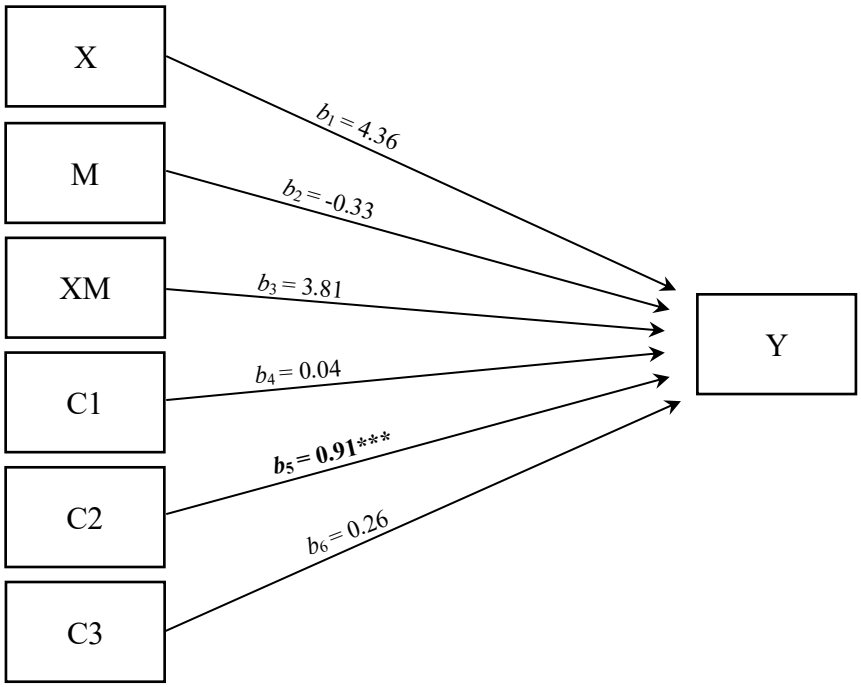
Research Question 9 – Rigidity & Parenting Stress

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	37.47	14.77	2.54	.012	8.26, 66.69
Maternal Rigidity (X)	4.36	3.12	1.40	.165	-1.81, 10.52
Child ASD Status (M)	-0.33	14.16	-0.02	.981	-28.35, 27.68
Rigidity * ASD (XM)	3.81	4.37	0.87	.385	-4.84, 12.45
Child Age (CV1)	0.04	0.09	0.47	.639	-0.13, 0.21
Child ADHD (CV2)	0.91	0.16	5.80	<.001	0.60, 1.22
Maternal ADHD (CV3)	0.26	0.23	1.11	.267	-0.20, 0.72

Note. $N = 135$. ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder.

Figure 18

Research Question 9 – Statistical Diagram

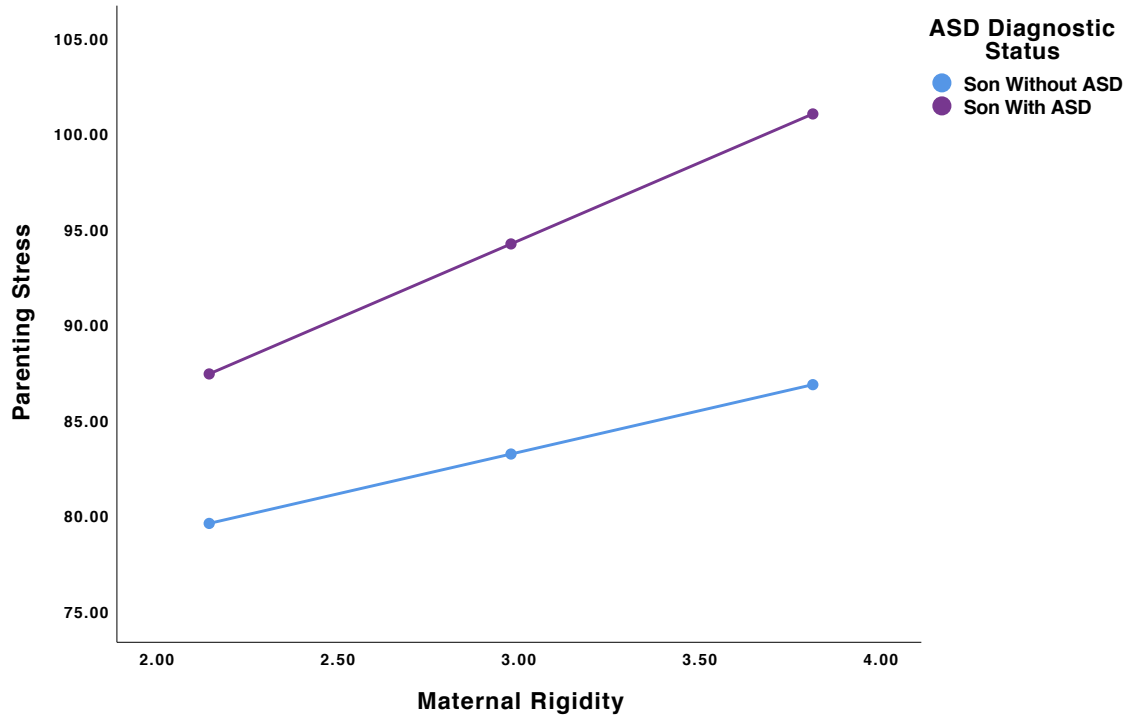


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal rigidity on parenting stress by child ASD status. X = maternal rigidity, M = child ASD status, Y = parenting stress, C1 = child age, C2 = child ADHD, and C3 = maternal ADHD.

$^{***}p < .001$

Figure 19

Research Question 9 – Graph with Fit Line



Note. A graphical representation of the effect of maternal rigidity on parenting stress levels by child ASD status.

Research Question 10: Maternal Aloofness as a Predictor of Parenting Stress

Results of this moderation analysis are presented in Table 14. The model was significant, $F(6, 130) = 20.28$, $p < .001$, with maternal aloofness, child ASD, and control variables (i.e., child age, child ADHD, maternal ADHD) accounting for 48% of the variance in parenting stress ($R^2 = .48$). Regarding main effects, child ADHD was the only significant predictor of parenting stress ($b = 0.93$, $p < .001$), where increases in sons' ADHD symptomology predicted increases in parenting stress levels for mothers. No other predictor variables or covariates were significant (see Table 14). In contrast to initial hypotheses, the addition of the interaction between maternal

aloofness and child ASD did not result in a significant change to the model, $F(1,130) = 0.31$, $p = .577$, $\Delta R^2 = .00$. For visual illustrations of the relationships among these variables, refer to the statistical diagram provided in Figure 20 and the graphical representation provided in Figure 21.

Table 14

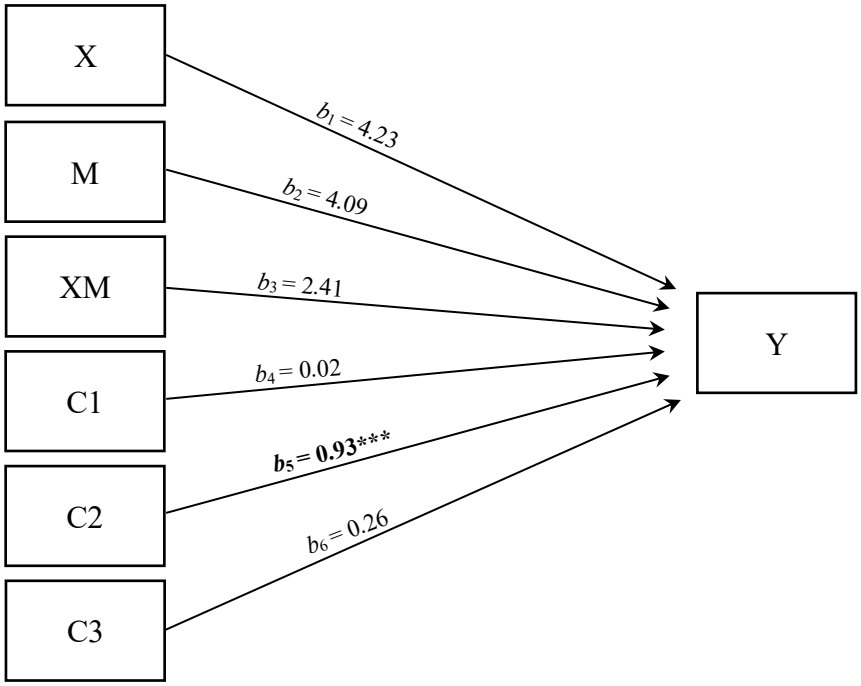
Research Question 10 – Aloofness & Parenting Stress

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	40.39	14.80	2.73	.007	11.11, 69.66
Maternal Aloofness (X)	4.23	3.13	1.35	.179	-1.96, 10.42
Child ASD Status (M)	4.09	13.63	0.30	.765	-22.88, 31.06
Aloofness * ASD (XM)	2.41	4.30	0.56	.577	-6.11, 10.93
Child Age (CV1)	0.02	0.09	0.19	.848	-0.15, 0.19
Child ADHD (CV2)	0.93	0.16	5.87	<.001	0.62, 1.24
Maternal ADHD (CV3)	0.26	0.23	1.11	.268	-0.20, 0.72

Note. $N = 137$. ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder.

Figure 20

Research Question 10 – Statistical Diagram

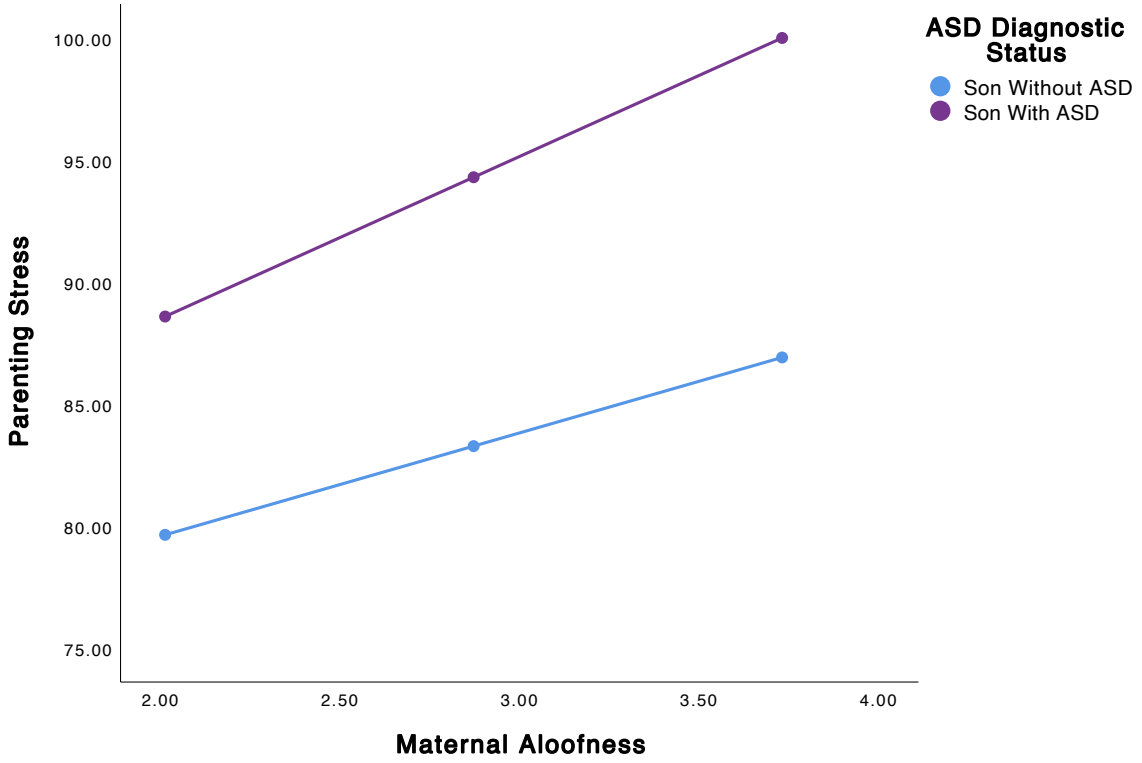


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal aloofness on parenting stress by child ASD status. X = maternal aloofness, M = child ASD status, Y = parenting stress, C1 = child age, C2 = child ADHD, and C3 = maternal ADHD.

$^{***}p < .001$

Figure 21

Research Question 10 – Graph with Fit Line



Note. A graphical representation of the effect of maternal aloofness on parenting stress levels by child ASD status.

Research Question 11: Maternal Pragmatic Language Difficulties as a Predictor of Parenting Stress

Results of this moderation analysis are presented in Table 15. The model was significant, $F(6, 130) = 22.79$, $p < .001$, with maternal pragmatic language difficulties, child ASD, and control variables (i.e., child age, child ADHD, maternal ADHD) accounting for 51% of the variance in parenting stress ($R^2 = .51$). Regarding main effects, child ADHD ($b = 0.95$, $p < .001$) and maternal pragmatic language difficulties ($b = 12.97$, $p = .002$) were significant predictors of

parenting stress. Increases in sons' ADHD symptomology and in mothers' difficulties with pragmatic language predicted increases in parenting stress for mothers. No other predictor variables or covariates were significant (see Table 15). Conflicting with initial hypotheses, the addition of the interaction between maternal pragmatic language difficulties and child ASD did not result in a significant change to the model, $F(1,130) = 0.07$, $p = .791$, $\Delta R^2 = .00$. For visual illustrations of the relationships among these variables, refer to the statistical diagram provided in Figure 22 and the graphical representation provided in Figure 23.

Table 15

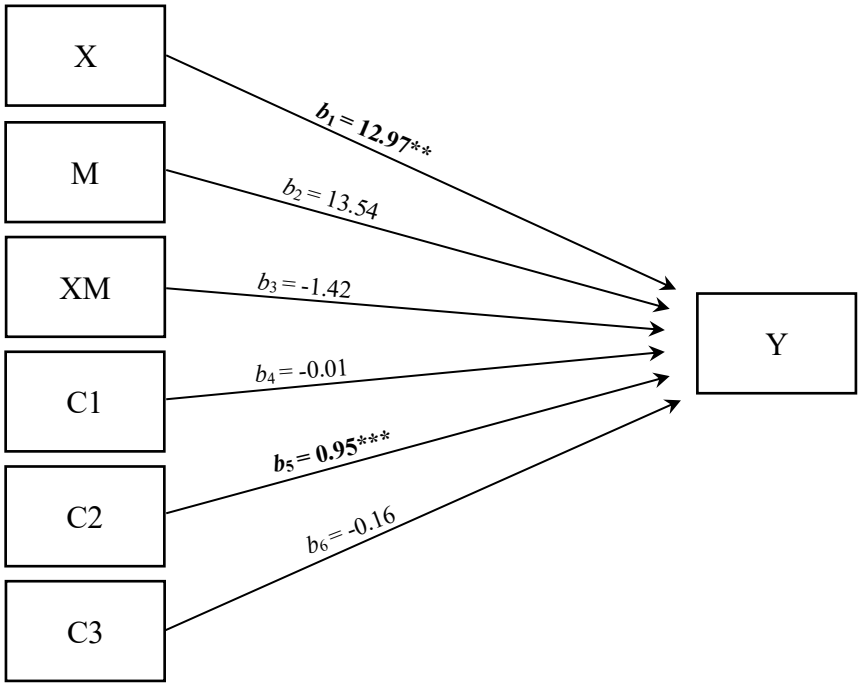
Research Question 11 – Pragmatic Language Difficulties & Parenting Stress

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	36.13	13.55	2.67	.009	9.32, 62.94
Maternal PLD (X)	12.97	4.17	3.11	.002	4.73, 21.21
Child ASD Status (M)	13.54	14.05	0.96	.337	-14.26, 41.35
PLD * ASD (XM)	-1.42	5.37	-0.27	.791	-12.04, 9.19
Child Age (CV1)	-0.01	0.08	-0.14	.892	-0.18, 0.15
Child ADHD (CV2)	0.95	0.15	6.20	<.001	0.65, 1.25
Maternal ADHD (CV3)	-0.16	0.27	-0.61	.541	-0.69, 0.36

Note. $N = 137$. PLD = pragmatic language difficulties; ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder.

Figure 22

Research Question 11 – Statistical Diagram

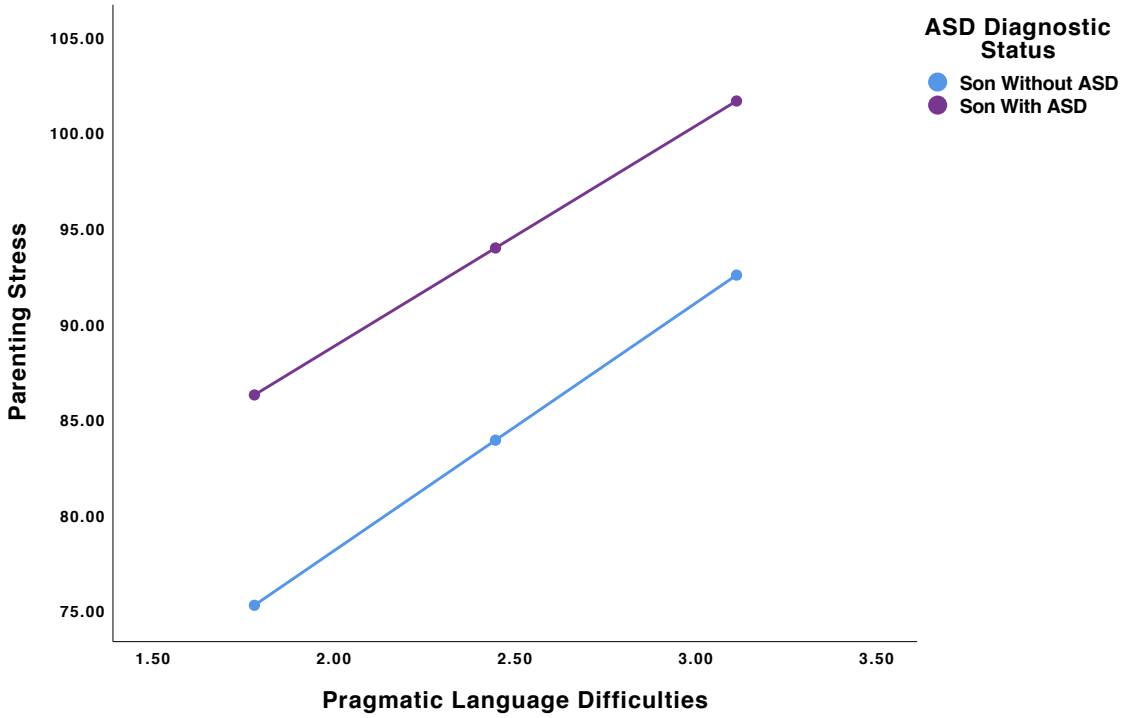


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of pragmatic language difficulties on parenting stress by child ASD status. X = maternal pragmatic language difficulties, M = child ASD status, Y = parenting stress, C1 = child age, C2 = child ADHD, and C3 = maternal ADHD.

$^{**}p < .01$, $^{***}p < .001$

Figure 23

Research Question 11 – Graph with Fit Line



Note. A graphical representation of the effect of maternal pragmatic language difficulties on parenting stress levels by child ASD status.

Research Question 12: Maternal BAP Characteristics (Overall) as a Predictor of Parenting Stress

Results of this moderation analysis are presented in Table 16. The model was significant, $F(6, 130) = 22.45$, $p < .001$, with maternal BAP characteristics, child ASD, and control variables (i.e., child age, child ADHD, maternal ADHD) accounting for 51% of the variance in parenting stress ($R^2 = .51$). Regarding main effects, child ADHD ($b = 0.92$, $p < .001$) and maternal BAP ($b = 11.29$, $p = .013$) were significant predictors of parenting stress. Increases in sons' ADHD symptomology and mothers' BAP characteristics predicted increases in parenting stress for

mothers. No other predictor variables or covariates were significant (see Table 16). Conflicting with initial hypotheses, the addition of the interaction between maternal BAP characteristics and child ASD did not result in a significant change to the model, $F(1,130) = 0.04$, $p = .791$, $\Delta R^2 = .00$. For visual illustrations of the relationships among these variables, refer to the statistical diagram provided in Figure 24 and the graphical representation provided in Figure 25.

Table 16

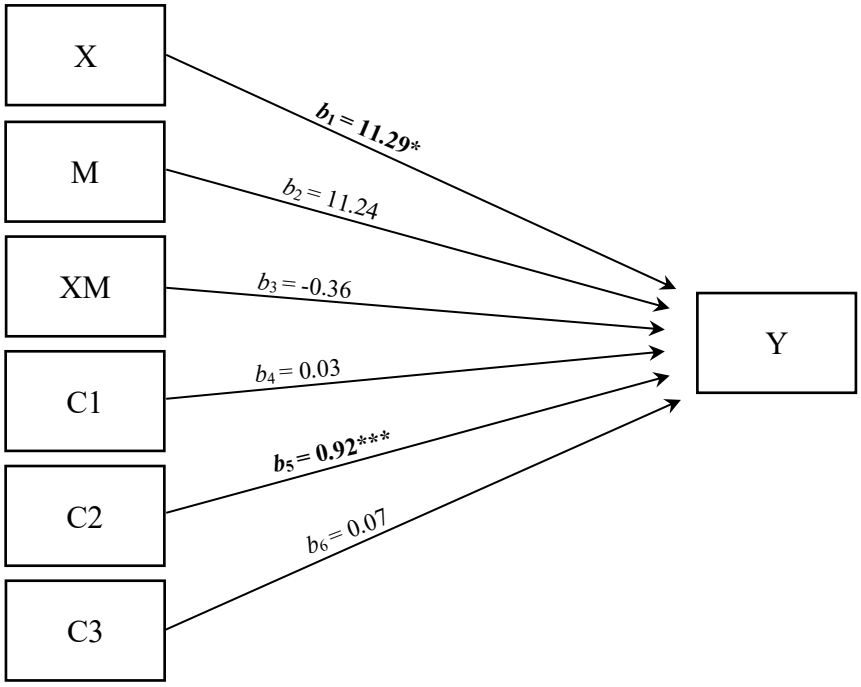
Research Question 12 – Total BAP & Parenting Stress

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	26.53	15.88	1.67	.097	-4.87, 57.94
Maternal BAP (X)	11.29	4.50	2.51	.013	2.38, 20.19
Child ASD Status (M)	11.24	16.56	0.68	.498	-21.51, 44.00
BAP * ASD (XM)	-0.36	5.64	-0.06	.949	-11.52, 10.80
Child Age (CV1)	0.03	0.08	0.32	.752	-0.14, 0.19
Child ADHD (CV2)	0.92	0.15	5.94	<.001	0.61, 1.22
Maternal ADHD (CV3)	0.07	0.24	0.29	.769	-0.40, 0.54

Note. $N = 137$. BAP = broader autism phenotype; ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder.

Figure 24

Research Question 12 – Statistical Diagram

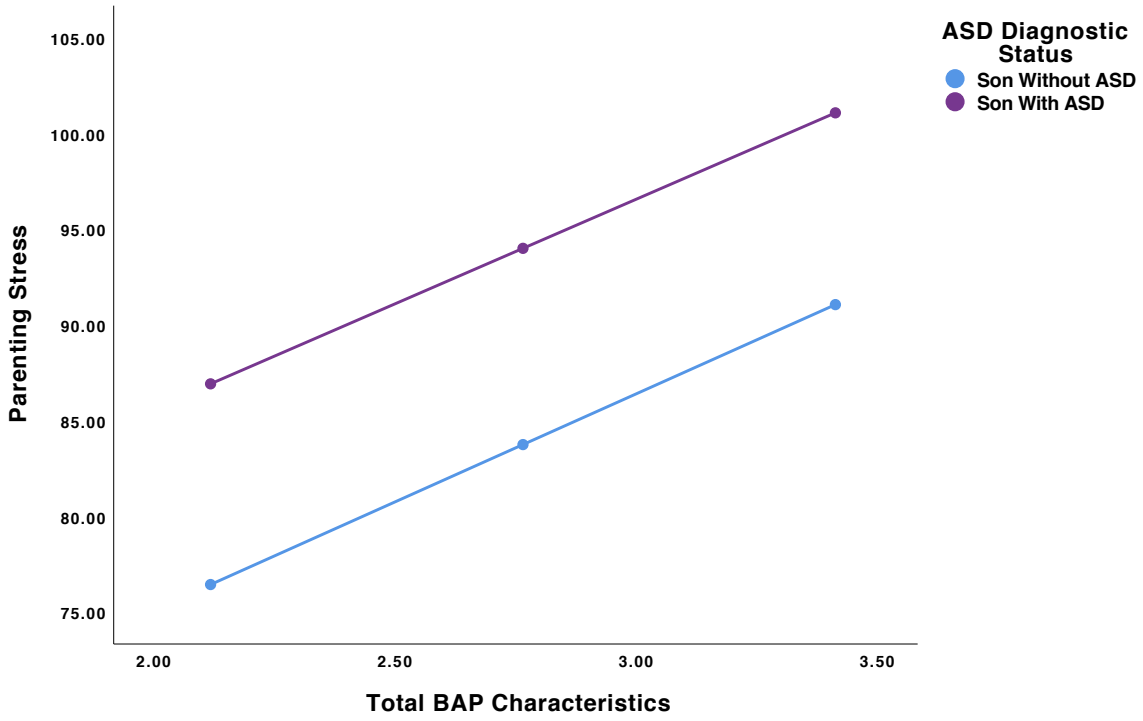


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of BAP characteristics on parenting stress by child ASD status. X = maternal BAP characteristics, M = child ASD status, Y = parenting stress, C1 = child age, C2 = child ADHD, and C3 = maternal ADHD.

$^{*}p < .05$, $^{***}p < .001$

Figure 25

Research Question 12 – Graph with Fit Line



Note. A graphical representation of the effect of maternal BAP Characteristics on parenting stress levels by child ASD status.

Post-Hoc Analyses

After completing initial data analyses, several post-hoc analyses were conducted to provide additional context to study findings. First, the regression analyses were rerun without the inclusion of covariates. Second, the regression analyses were rerun to explore the similarity-fit hypothesis within the context of ADHD symptomology. Third, additional demographic data relating to family supports were explored. Findings of each post-hoc inquiry are outlined below.

Similarity-Fit and ASD without Covariates

The literature has continually established high rates of comorbidity between ADHD and ASD symptomology. As outlined earlier, the present study found significant correlations—with medium to large effects—between child ADHD, child ASD, maternal ADHD, and maternal BAP characteristics. As such, post-hoc analyses were conducted to clarify whether evidence for similarity-fit would be evident if control variables were removed from the model, potentially increasing power for the main variables. More specifically, the twelve moderation analyses were rerun without the inclusion of covariates to further explore the relationship between maternal BAP (IV), child ASD (M), and parenting outcomes (IV). Even when covariates were removed, model significance did not change for any of the twelve regressions and no significant interaction effects were found (see Appendix I for SPSS output from these analyses).

Similarity-Fit and ADHD

To explore whether the similarity-fit hypothesis applies to ADHD symptoms in this sample, three additional moderation analyses were conducted. More specifically, multiple regression was used to determine whether child ADHD status [M]—a dichotomous variable grouping mothers based on whether or not their son had ADHD—moderated the relationship between maternal ADHD symptoms [IV] and:

1. Positive and involved parenting practices [DV1]
2. Negative parenting practices [DV2]
3. Parenting stress [DV3]

Each moderation analysis controlled for child age, child ASD symptomology, and overall maternal BAP characteristics. These analyses were conducted using Model 1 in PROCESS

Version 3.5 for IBM SPSS Statistics (Hayes 2018, IBM Corp, 2019). See Figure 26 for a conceptual diagram of this model.

Figure 26

Moderation Model 1 – Conceptual Diagram for ADHD

This item has been removed to ensure copyright compliance. To view Model 1, refer to its source.

Note. This conceptual diagram was adapted from Moderation Model 1 as outlined in *Introduction to Mediation, Moderation, and Conditional Process Analysis, Second Edition: A Regression-Based Approach* by Andrew F. Hayes. Copyright © 2018 The Guilford Press. X = predictor variable (maternal ADHD), M = moderator (child ADHD status), Y = outcome variables (i.e., positive and involved parenting, negative parenting practices, or parenting stress), and CV = covariate (child age, child ASD symptomology, and maternal BAP total score).

ADHD Similarity-Fit and Positive/Involved Parenting. Results of this moderation analysis are presented in Table 17. The model was significant, $F(6, 134) = 2.40$, $p = .031$, with maternal ADHD characteristics, child ADHD, and control variables (i.e., child age, child ASD, maternal BAP) accounting for 10% of the variance in parenting stress ($R^2 = .10$). Regarding main effects, maternal BAP ($b = -2.96$, $p = .003$) was the only significant predictor of positive and involved parenting. No other predictor variables or covariates were significant (see Table 17). While an interaction trend is observable (see Figure 26), the addition of the interaction between maternal ADHD and child ADHD did not provide a significant change to the model, $F(1,134) = 1.70$, $p = .192$, $\Delta R^2 = .01$. For visual illustrations of the relationships among these variables, refer

to the statistical diagram provided in Figure 27 and the graphical representation provided in Figure 28.

Table 17

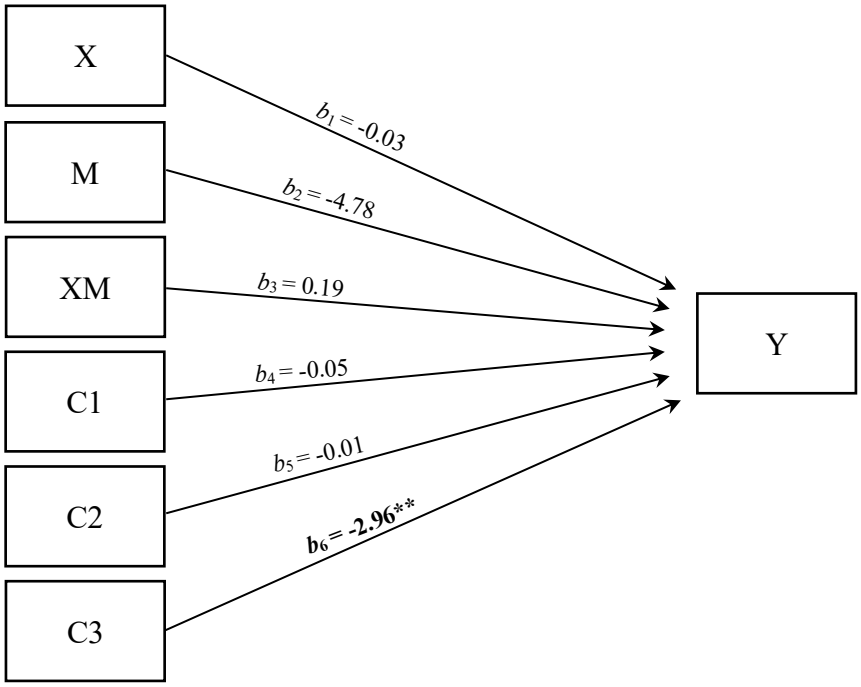
ADHD Similarity-Fit – Positive and Involved Parenting

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	81.88	4.42	18.54	<.001	73.15, 90.61
Maternal ADHD (X)	-0.03	0.08	-0.40	.691	-0.19, 0.13
Child ADHD Status (M)	-4.78	4.53	-1.06	.293	-13.74, 4.18
Maternal * Child (XM)	0.19	0.15	1.30	.194	-0.10, 0.49
Child Age (CV1)	-0.05	0.03	-1.77	.079	-0.10, 0.01
Child ASD (CV2)	-0.01	0.02	-0.31	.757	-0.05, 0.04
Maternal BAP (CV3)	-2.96	0.98	-3.03	.003	-4.90, -1.03

Note. N = 141. ADHD = attention-deficit/hyperactivity disorder; ASD = autism spectrum disorder; BAP = broader autism phenotype.

Figure 27

ADHD Similarity-Fit – Positive/Involved Parenting Statistical Diagram

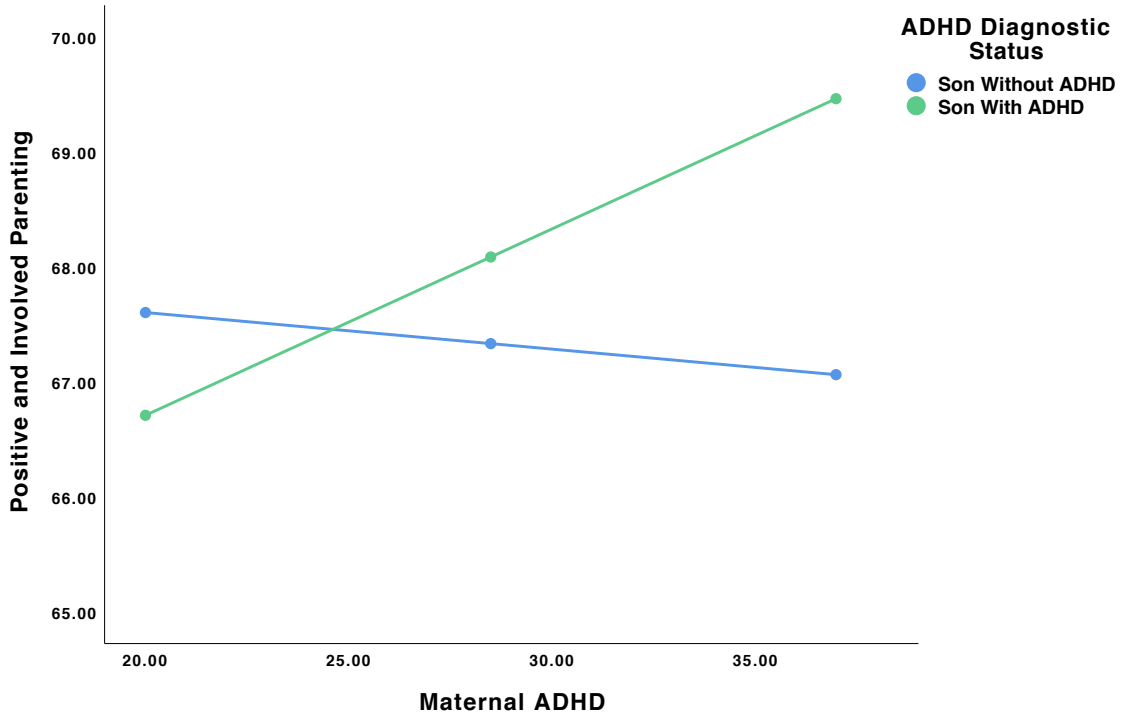


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal ADHD characteristics on positive and involved parenting by child ADHD status. X = maternal ADHD, M = child ADHD status, Y = positive and involved parenting, C1 = child age, C2 = child ASD, and C3 = maternal BAP.

$^{**}p < .01$

Figure 28

ADHD Similarity-Fit – Positive/Involved Parenting Graph with Fit Line



Note. A graphical representation of the effect of maternal ADHD symptomology on positive and involved parenting by child ADHD status.

ADHD Similarity-Fit and Negative Parenting Practices. Results of this moderation analysis are presented in Table 18. The model was significant, $F(6, 128) = 4.57$, p <.001, with maternal ADHD characteristics, child ADHD, and control variables (i.e., child age, child ASD, maternal BAP) accounting for 18% of the variance in negative parenting practices ($R^2 = .18$). With the exception of child ASD symptomology, all other main effects were significant. Mothers with older sons ($b = .06$, $p = .011$) and mothers with greater BAP characteristics ($b = 3.47$, $p <$ .001) were more likely to endorse using negative parenting practices.

Particularly noteworthy is that maternal ADHD (b = 0.15, p = .037), child ADHD (b = 9.99, p = .023), and their interaction (b = -0.33, p = .024) were significant predictors of negative parenting practices. The addition of the interaction between maternal ADHD and child ADHD resulted in a significant change to the model, $F(1,128) = 5.23$, p = .024, ΔR^2 = .03. The simple slopes were examined to interpret the conditional effects of this interaction. Among mothers of sons with ADHD, those with greater ADHD symptomology were less likely to endorse using negative parenting practices, though this effect was not statistically significant (b = -0.18, $t(128)$ = -1.36, p = .176). Conversely, for mothers of sons without ADHD, those with greater ADHD symptomology were significantly more likely to endorse using negative parenting practices (b = 0.15, $t(128) = 2.11$, p = .037). For visual illustrations of the relationships among these variables, refer to the statistical diagram provided in Figure 29 and the graphical representation provided in Figure 30.

Table 18

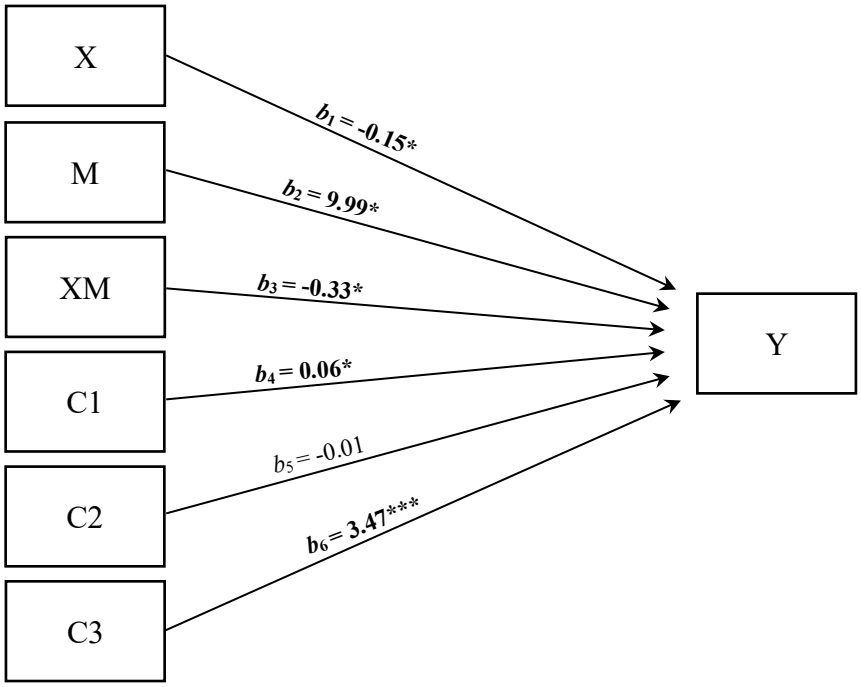
ADHD Similarity-Fit – Negative Parenting Practices

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	6.71	4.16	1.61	.109	-1.51, 14.93
Maternal ADHD (X)	0.15	0.07	2.11	.037	0.01, 0.30
Child ADHD Status (M)	9.99	4.35	2.30	.023	1.38, 18.60
Maternal * Child (XM)	-0.33	0.15	-2.29	.024	-0.62, -0.04
Child Age (CV1)	0.06	0.02	2.58	.011	0.01, 0.11
Child ASD (CV2)	-0.01	0.02	-0.73	.468	-0.05, 0.02
Maternal BAP (CV3)	3.47	0.92	3.78	<.001	1.65, 5.29

Note. N = 135. ADHD = attention-deficit/hyperactivity disorder; ASD = autism spectrum disorder; BAP = broader autism phenotype.

Figure 29

ADHD Similarity-Fit – Negative Parenting Statistical Diagram

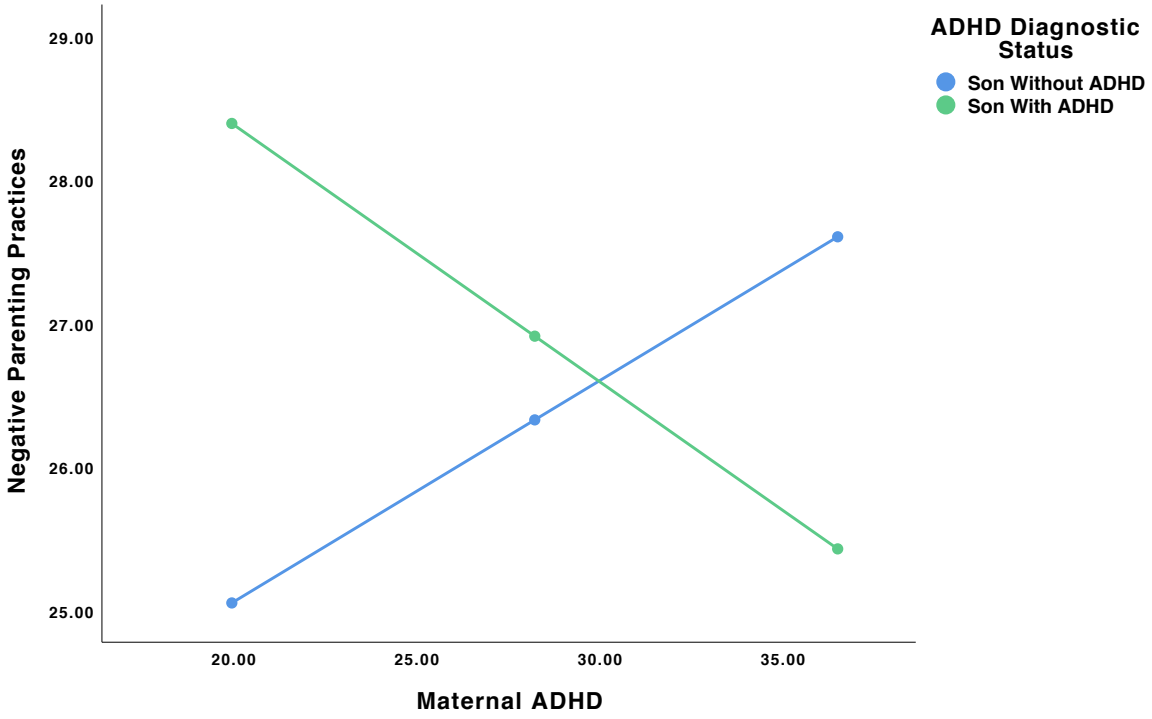


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal ADHD characteristics on negative parenting practices by child ADHD status. X = maternal ADHD, M = child ADHD status, Y = negative parenting practices, C1 = child age, C2 = child ASD, and C3 = maternal BAP.

$^{*}p < .05$, $^{***}p < .001$

Figure 30

ADHD Similarity-Fit – Negative Parenting Graph with Fit Line



Note. A graphical representation of the effect of maternal ADHD symptomology on negative parenting practices by child ADHD status.

ADHD Similarity-Fit and Parenting Stress. Results of this moderation analysis are presented in Table 19. The model was significant, $F(6, 130) = 21.18$, p <.001, with maternal ADHD characteristics, child ADHD, and control variables (i.e., child age, child ASD, maternal BAP) accounting for 49% of the variance in parenting stress ($R^2 = .49$). With the exception of child age, all other main effects were significant. Mothers of sons with greater ASD symptomology ($b = 0.40$, $p < .001$) and mothers with greater BAP characteristics ($b = 11.23$, $p <$ .001) were more likely to endorse higher parenting stress levels.

Perhaps more importantly, maternal ADHD (b = 0.79, p = .003), child ADHD (b = 51.42, p < .001), and their interaction (b = -1.40, p = .005) were significant predictors of parenting stress. The addition of the interaction between maternal ADHD and child ADHD resulted in a significant change to the model, $F(1,130) = 8.21$, p = .005, ΔR^2 = .03. The simple slopes were examined to interpret the conditional effects of this interaction. Among mothers of sons with ADHD, greater ADHD symptomology corresponded with lower parenting stress levels, though this effect was not statistically significant (b = -0.61, $t(130) = -1.40$, p = .163). Conversely, for mothers of sons without ADHD, greater ADHD symptomology was significantly linked with increased parenting stress (b = 0.79, $t(130) = 3.02$, p = .003). For visual illustrations of the relationships among these variables, refer to the statistical diagram provided in Figure 31 and the graphical representation provided in Figure 32.

Table 19

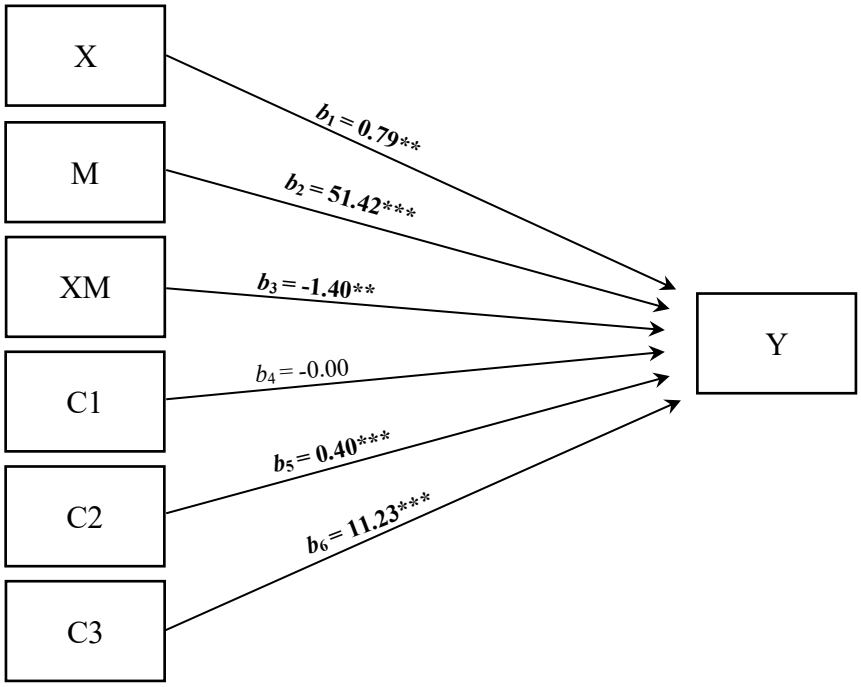
ADHD Similarity-Fit – Parenting Stress

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	3.21	14.51	0.22	.826	-25.50, 31.91
Maternal ADHD (X)	0.79	0.26	3.02	.003	0.27, 1.31
Child ADHD Status (M)	51.42	14.98	3.43	<.001	21.79, 81.05
Maternal * Child (XM)	-1.40	0.49	-2.87	.005	-2.37, -0.43
Child Age (CV1)	-0.00	0.09	-0.02	.987	-0.17, 0.17
Child ASD (CV2)	0.40	0.07	5.67	<.001	0.26, 0.54
Maternal BAP (CV3)	11.23	3.18	3.54	<.001	4.95, 17.51

Note. N = 137. ADHD = attention-deficit/hyperactivity disorder; ASD = autism spectrum disorder; BAP = broader autism phenotype.

Figure 31

ADHD Similarity-Fit – Parenting Stress Statistical Diagram

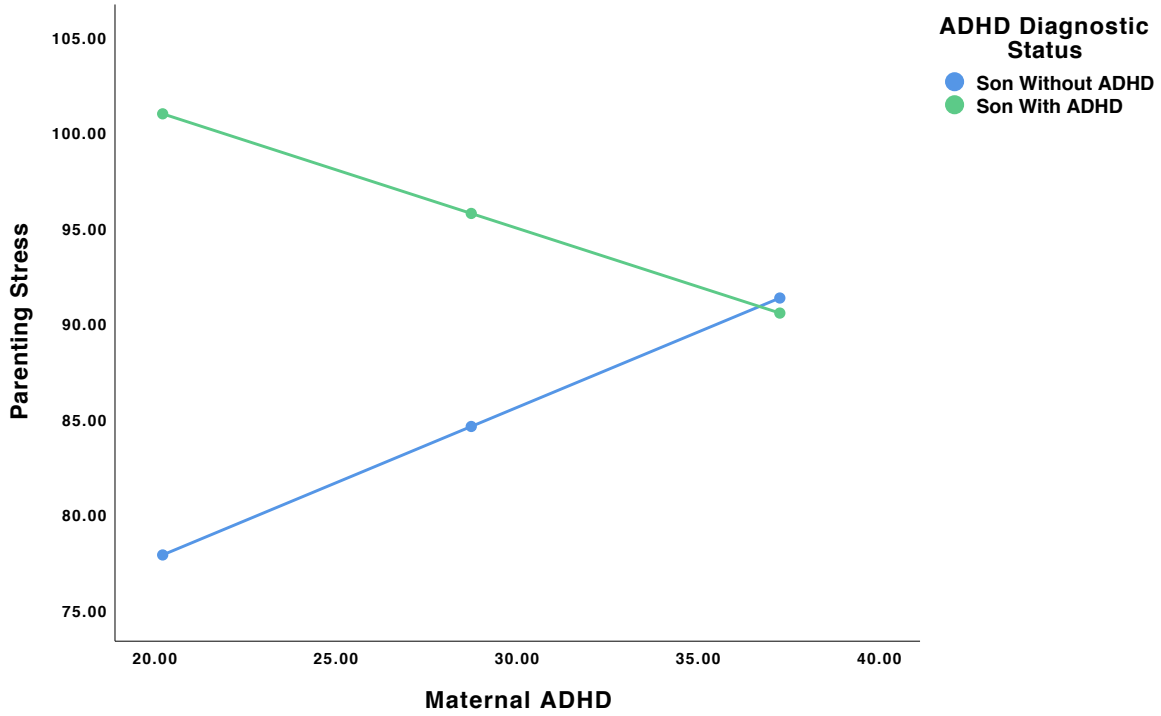


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal ADHD characteristics on parenting stress by child ADHD status. X = maternal ADHD, M = child ADHD status, Y = parenting stress, C1 = child age, C2 = child ASD, and C3 = maternal BAP.

$^{**}p < .01$, $^{***}p < .001$

Figure 32

ADHD Similarity-Fit – Parenting Stress Graph with Fit Line



Note. A graphical representation of the effect of maternal ADHD symptomology on parenting stress by child ADHD status.

ADHD Similarity-Fit in ASD Sample. To explore whether the above ADHD similarity-fit findings were upheld when *all* sons had comorbid ASD, three additional moderation analyses were conducted with data from the subset of mothers who had a son with ASD. Parallel to the first three analyses, multiple regression was used to determine whether child ADHD status moderated the relationship between maternal ADHD symptoms and parenting outcomes (i.e., positive and involved parenting [n = 57], negative parenting practices [n = 53], and parenting stress [n = 55]) in a sample of mothers of sons with ASD. Each moderation analysis controlled for child age, child ASD symptomology, and overall maternal BAP characteristics.

None of the regression models were significant in predicting positive and involved parenting $F(6, 50) = 1.08$, $p = .386$, negative parenting practices, $F(6, 46) = 2.30$, $p = .05$, or parenting stress, $F(6, 48) = 1.66$, $p = .152$. Furthermore, the addition of the interaction between maternal ADHD and child ADHD did not provide a significant change to the model for positive and involved parenting, $F(1,50) = 0.50$, $p = .481$, $\Delta R^2 = .01$, negative parenting practices $F(1,46) = 1.49$, $p = .229$, $\Delta R^2 = .02$, or parenting stress, $F(1,48) = 0.85$, $p = .360$, $\Delta R^2 = .01$. More detailed results of these regressions can be found in Tables 20 – 22. Of note, the small sample size and resulting lower power likely limited the possibility of detecting significant findings. Still, each of these regressions followed a similar trend to the initial ADHD similarity-fit regressions, supporting the prospect that this interaction pattern still applied even when all children had comorbid ASD (see Figures 33-38 for statistical diagrams and graphical representations of these regression trends).

Table 20

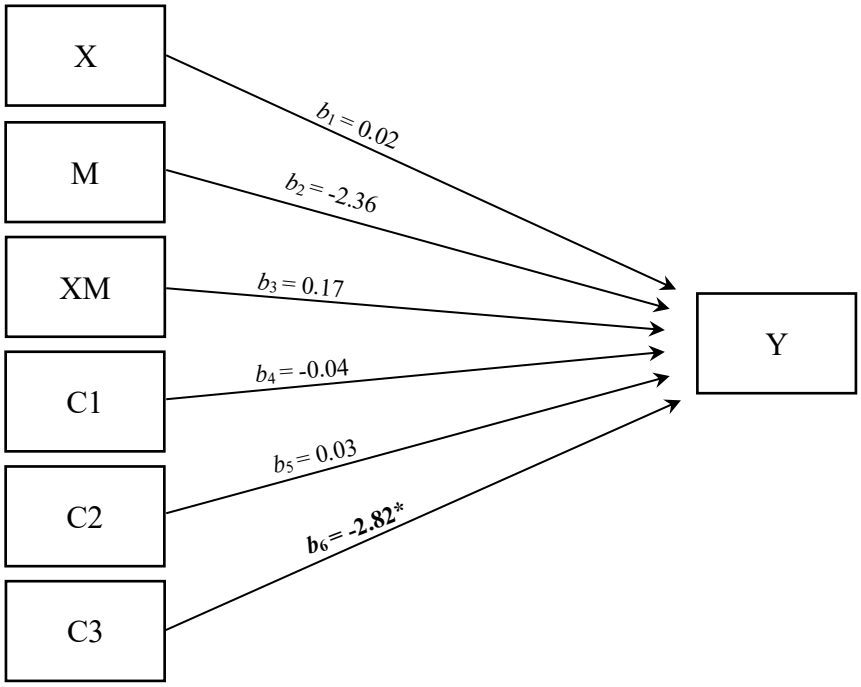
ADHD Similarity-Fit in ASD Sample – Positive and Involved Parenting

Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	74.61	9.90	7.54	<.001	54.72, 94.49
Maternal ADHD (X)	0.02	0.17	0.09	.928	-0.33, 0.36
Child ADHD Status (M)	-2.36	7.11	-0.33	.741	-16.64, 11.92
Maternal * Child (XM)	0.17	0.24	0.71	.481	-0.31, 0.64
Child Age (CV1)	-0.04	0.05	-0.79	.433	-0.13, 0.06
Child ASD (CV2)	0.03	0.07	0.46	.648	-0.11, 0.17
Maternal BAP (CV3)	-2.82	1.38	-2.04	.047	-5.60, -0.04

Note. N = 57. ADHD = attention-deficit/hyperactivity disorder; ASD = autism spectrum disorder; BAP = broader autism phenotype.

Figure 33

ADHD Similarity-Fit in ASD Sample – Positive/Involved Parenting Statistical Diagram

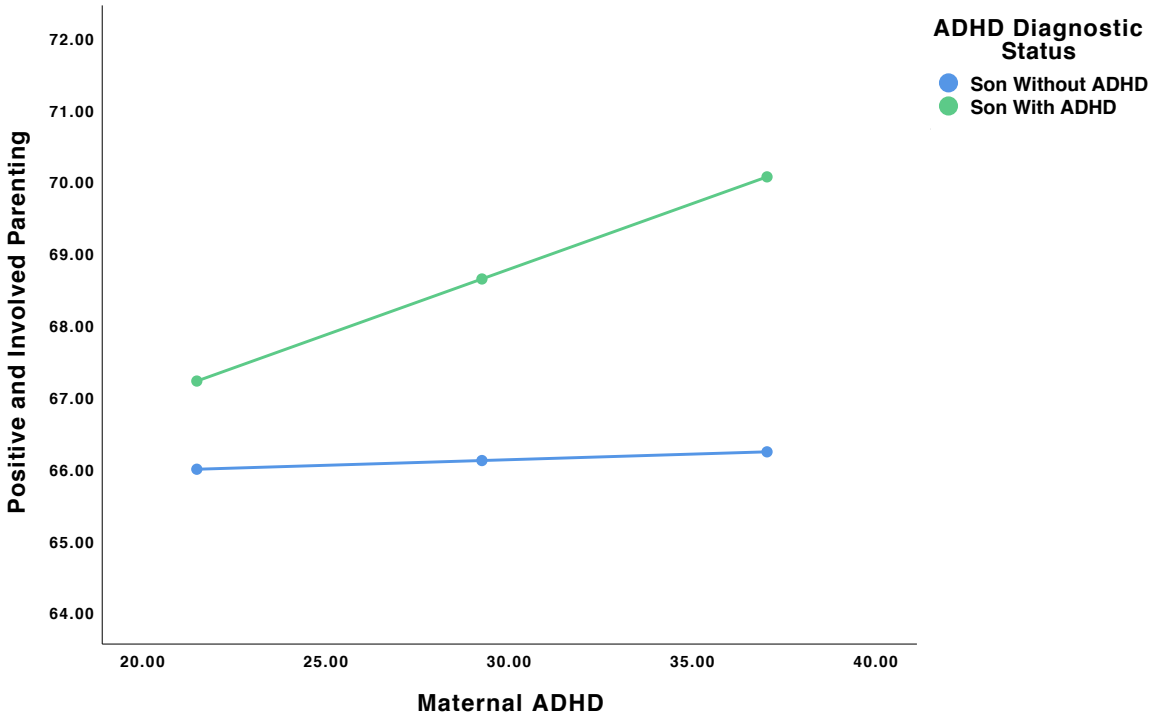


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal ADHD characteristics on positive and involved parenting by child ADHD status in an ASD sample. X = maternal ADHD, M = child ADHD status, Y = positive and involved parenting, C1 = child age, C2 = child ASD, and C3 = maternal BAP.

$^{**}p < .01$, $^{***}p < .001$

Figure 34

ADHD Similarity-Fit in ASD Sample – Positive/Involved Parenting Graph with Fit Line



Note. A graphical representation of the effect of maternal ADHD symptomology on positive and involved parenting practices by child ADHD status within an ASD only sample.

Table 21

ADHD Similarity-Fit in ASD Sample – Negative Parenting Practices

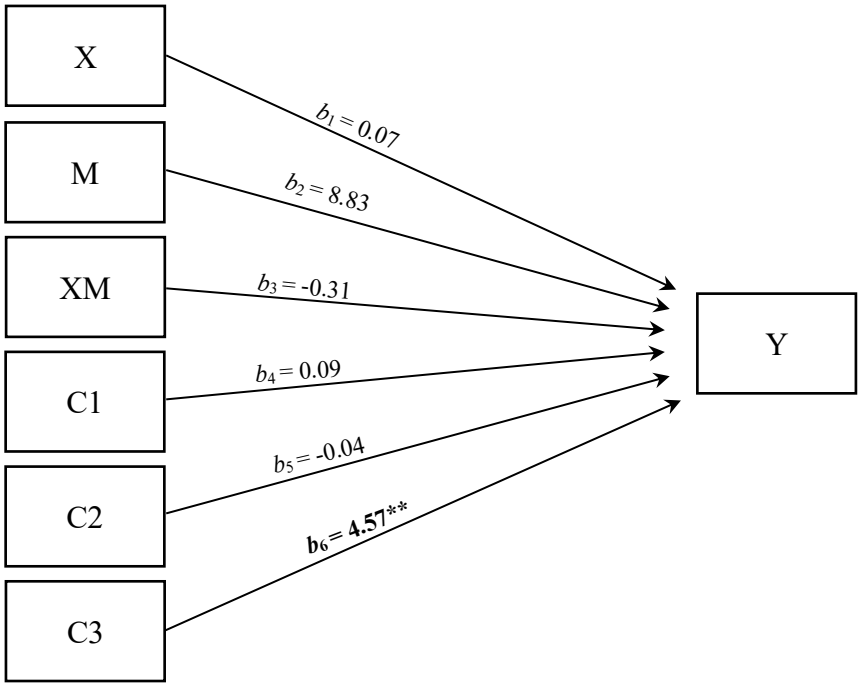
Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	6.24	9.99	0.62	.535	-13.87, 26.35
Maternal ADHD (X)	0.07	0.16	0.44	.659	-0.26, 0.40
Child ADHD Status (M)	8.83	7.43	1.19	.241	-6.12, 23.78
Maternal * Child (XM)	-0.31	0.25	-1.22	.229	-0.82, 0.20
Child Age (CV1)	0.09	0.05	1.78	.082	-0.01, 0.18

Child ASD (CV2)	-0.04	0.07	-0.61	.543	-0.18, 0.10
Maternal BAP (CV3)	4.57	1.43	3.19	.003	1.69, 7.45

Note. N = 53. ADHD = attention-deficit/hyperactivity disorder; ASD = autism spectrum disorder; BAP = broader autism phenotype.

Figure 35

ADHD Similarity-Fit in ASD Sample – Negative Parenting Statistical Diagram

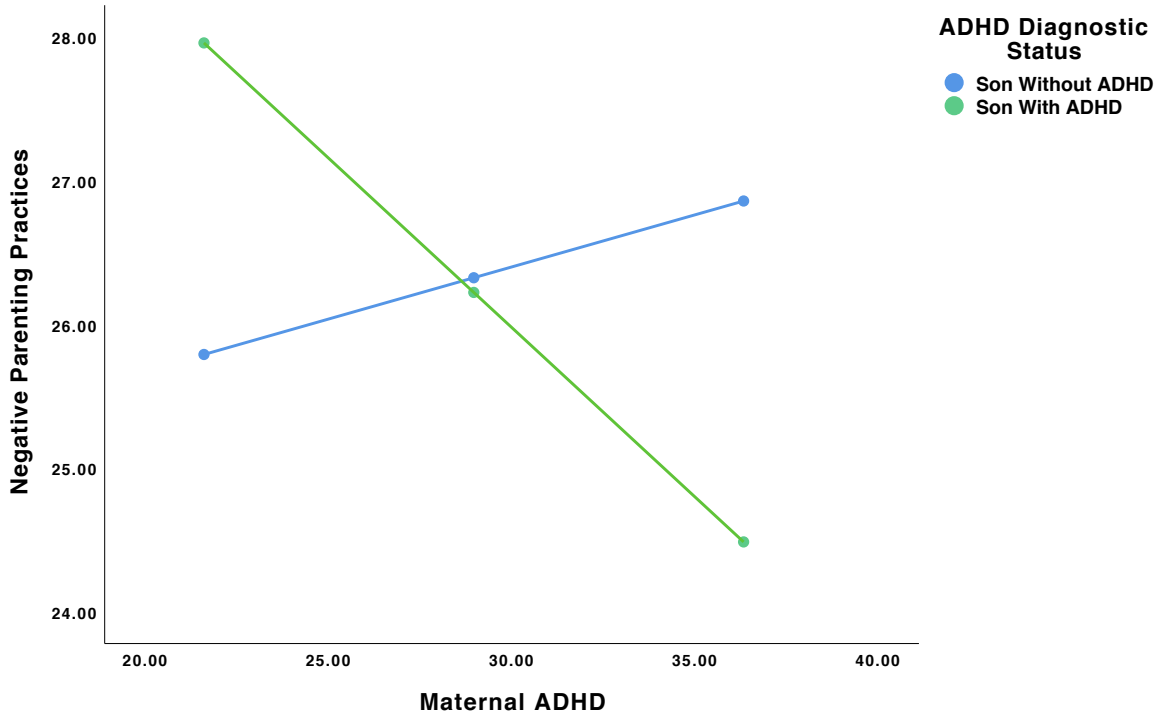


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal ADHD characteristics on negative parenting practices by child ADHD status in an ASD sample. X = maternal ADHD, M = child ADHD status, Y = negative parenting practices, C1 = child age, C2 = child ASD, and C3 = maternal BAP.

$^{**}p < .01$, $^{***}p < .001$

Figure 36

ADHD Similarity-Fit in ASD Sample – Negative Parenting Graph with Fit Line



Note. A graphical representation of the effect of maternal ADHD symptomology on negative parenting practices by child ADHD status within an ASD only sample.

Table 22

ADHD Similarity-Fit in ASD Sample – Parenting Stress

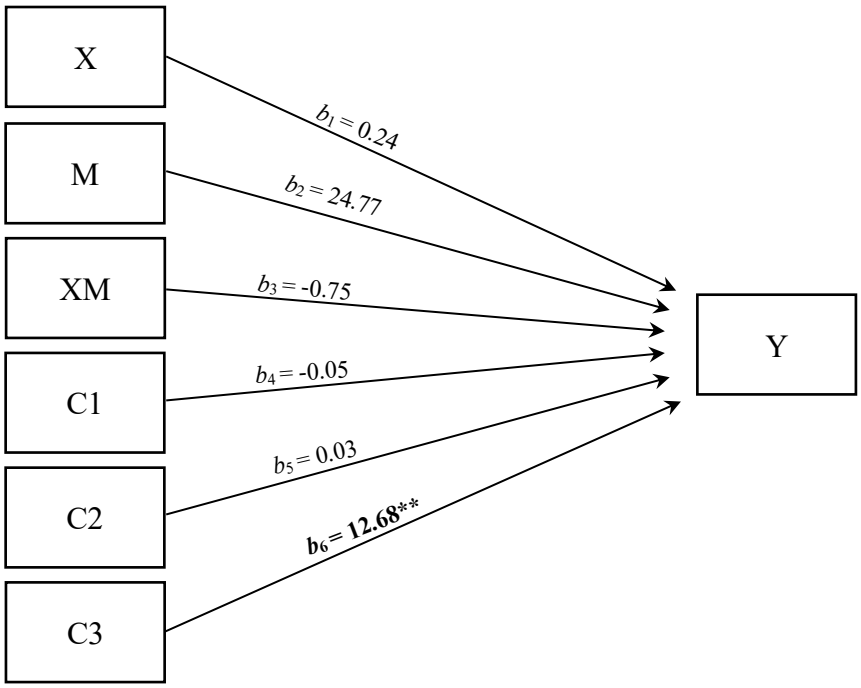
Variable	*b*	*SE*	*t*	*p*	*95% CI*
Constant	61.38	34.00	1.81	.077	-6.98, 129.74
Maternal ADHD (X)	0.24	0.60	0.40	.688	-0.96, 1.44
Child ADHD Status (M)	24.77	24.67	1.00	.320	-24.83, 74.37
Maternal * Child (XM)	-0.75	0.81	-0.92	.360	-2.37, 0.88

Child Age (CV1)	-0.05	0.16	-0.29	.773	-0.36, 0.27
Child ASD (CV2)	0.03	0.23	0.15	.882	-0.43, 0.50
Maternal BAP (CV3)	12.68	4.60	2.76	.008	3.44, 21.92

Note. N = 55. ADHD = attention-deficit/hyperactivity disorder; ASD = autism spectrum disorder; BAP = broader autism phenotype.

Figure 37

ADHD Similarity-Fit in ASD Sample – Parenting Stress Statistical Diagram

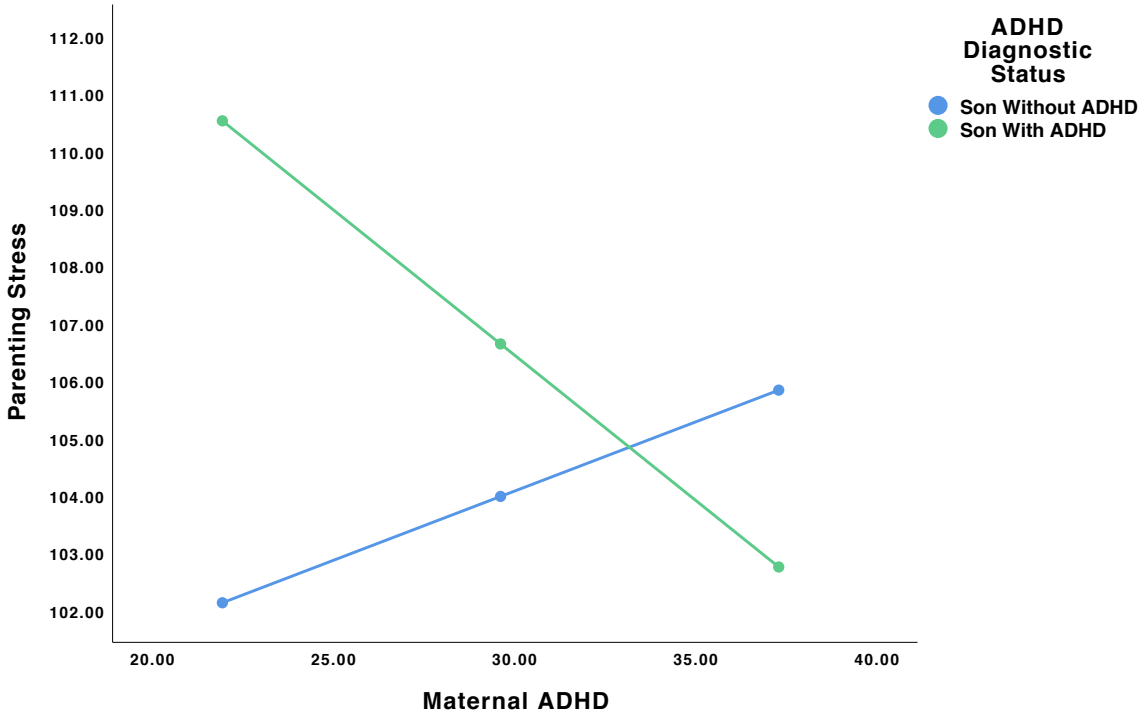


Note. A pathway diagram of the unstandardized regression coefficients for the moderation of maternal ADHD characteristics on parenting stress by child ADHD status in an ASD sample. X = maternal ADHD, M = child ADHD status, Y = parenting stress, C1 = child age, C2 = child ASD, and C3 = maternal BAP.

$^{**}p < .01$, $^{***}p < .001$

Figure 38

ADHD Similarity-Fit in ASD Sample – Parenting Stress Graph with Fit Line



Note. A graphical representation of the effect of maternal ADHD symptomology on parenting stress by child ADHD status within an ASD only sample.

Satisfaction with Support

To provide additional demographic context to the present sample, parents were asked about the supports that they are receiving for their child and family (i.e., *What supports are you currently receiving for your child and/or family (paid for by yourself, the education system, health care funding, or other government sources)?*). Mothers of children with ASD highlighted a range of private and publicly funded supports, particularly clinical resources (i.e., speech and language pathology, occupational therapy, psychology), therapeutic/counselling supports (for self, child, or family), behavioural intervention, medication, respite, financial support (e.g., tax

credits, disability support), and specialized school supports (e.g., educational assistant, school team involvement, specialized programming, individual education plan). In comparison, mothers of children without ASD more commonly discussed broader support systems, including health, dental, medical, education, and child tax benefits. Some of these mothers also discussed childcare, clinical supports (e.g., speech language pathology, occupational therapy), and counseling (for self, child, or family).

When asked about unmet support needs (i.e., *What supports do you feel you need?*), mothers of children without ASD more often responded that they were not in need of additional supports. Only two mothers of children with ASD (3.5%) explicitly reported not needing further support, compared to 20 mothers of children without ASD (23.3%). Mothers of children with ASD most commonly highlighted needing respite, mental health supports, clinical resources (e.g., occupational therapy, speech language pathology, physical therapy, behavioural therapy), and additional school/learning support. Several mothers also expressed a need for more extracurricular activities and opportunities for their son to socialize with others. Additionally, numerous mothers emphasized a need for more funding to help pay for clinical interventions, mental health resources, and extracurricular activities. Several mothers of sons with ASD or other developmental conditions indicated a need for better psychoeducation (for parents and school staff) and parent coaching to assist in better supporting their child. Among mothers of children without ASD, easier access to childcare, before/after school programing, and accommodations for working mothers were most commonly cited as in need. Interestingly, several mothers highlighted the impact of the Covid-19 pandemic, which has created a greater need for respite and at-home learning support. Some mothers also reported a need for clinical

resources (i.e., occupational therapy, psychology), counselling, community/family support, and financial assistance.

Mothers were also asked to use a sliding scale item (0-100) to rate *How well you feel your support needs for your child/family are being met*. This item was completed by 125 participants. While not a primary research question, this data was further explored via quantitative post-hoc analyses to compare satisfaction between mothers of sons with and without ASD and to explore the relationship between support satisfaction and key study variables. On average, mothers rated their satisfaction level at 74.4 (SD = 21.6) on a scale of 100, where higher scores indicate greater satisfaction. Compared to mothers of children without ASD (M = 78.6, SD = 21.7), mothers of children with ASD (M = 68.6, SD = 20.3) reported significantly lower ratings of satisfaction with their support needs being met ($t(123) = 2.61$, $p = .010$).

Correlational findings are presented in Table 23. This table includes both total sample correlations and separate correlations for mothers of children with and without ASD. Satisfaction with support was significantly related to all parenting outcome variables, resulting in medium to large effects. More specifically, lower levels of satisfaction corresponded with increased use of negative parenting practices, less positive and involved parenting, and greater parenting stress. Interestingly, for mothers of sons with ASD, maternal and child clinical characteristics (i.e., ASD, BAP, ADHD) were not related to satisfaction with support needs being met. Conversely, for mothers of sons without ASD, lower levels of satisfaction corresponded with greater child ASD, child ADHD, maternal ADHD, and maternal BAP characteristics. Sons' age was the only key variable not correlated with support need satisfaction.

Table 23

Correlations with Support Satisfaction

	Son with ASD *n* = 53	Son without ASD *n* = 72	Total Sample *N* = 125
Variable	*r*	*r*	*r*
Age of Son (Months)	-.092	.090	.006
Child ADHD Symptoms[a]	-.075	-.543***	-.425***
Maternal ADHD Symptoms[b]	-.044	-.362**	-.260**
Child ASD Symptoms[c]	-.002	-.460***	-.327***
Maternal Aloofness[d]	-.153	-.194	-.194*
Maternal Pragmatic Language Difficulties[d]	-.227	-.153	-.217*
Maternal Rigidity[d]	-.211	-.252*	-.253**
Maternal BAP Total[d]	-.218	-.264*	-.264**
Positive/Involved Parenting[e]	.355**	.118	.222*
Negative Parenting Practices[e]	-.405**	-.311**	-.345***
Parenting Stress[f]	-.530***	-.584***	-.582***

Note. *N* = 125 for all but positive/involved parenting (N = 123), negative parenting practices (N = 117), parenting stress (N = 124). ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder; BAP = Broader Autism Phenotype

[a]ADHD Rating Scale—IV; [b]Barkley Adult ADHD Rating Scale-IV; [c]Autism Spectrum Quotient—Child Version; [d]Broad Autism Phenotype Questionnaire; [e]Alabama Parenting Questionnaire; [f]Parenting Stress Index–4—Short Form.

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

Chapter 5: Discussion

Guided by the similarity-fit hypothesis, the present study explored the relationship between parent and child characteristics (i.e., ASD, BAP, ADHD) and parenting outcomes in a sample of mothers of sons with and without ASD. While the primary goal of this study was to explore applicability of the strengths-based similarity-fit hypothesis, there were also several notable findings regarding relationships between key variables that are worth discussing. These findings are highlighted below before outlining conclusions relating to similarity-fit.

Relationships Between Variables

The BAP, ASD, and ADHD

In alignment with the literature on comorbidity rates between ASD and ADHD (see Klinger et al., 2014), symptomology was highly linked in the present study. Sons with greater ASD symptomology were more likely to have greater ADHD symptomology. Similarly, greater maternal BAP characteristics were positively related to maternal ADHD symptomology. This link was particularly true for pragmatic language difficulties, which was most highly correlated with ADHD—a finding that may speak to higher rates of comorbidity and/or greater overlap in symptoms between ADHD and pragmatic language difficulties. Indeed, the BAPQ pragmatic language difficulties subscale includes several items that could also conceivably be attributed to inattention, impulsivity, and hyperactivity (e.g., *getting sidetracked in conversation*, feeling *disconnected or "out of sync" in conversations*, *leav*[ing] *long pauses in conversation*, being *"in-tune" with the other person during conversation*).

This study also established medium correlations *between* mothers and sons for ASD, the BAP, and ADHD—supporting ongoing findings of higher co-aggregation of these characteristics and neurodevelopmental conditions within families (Ghirardi et al., 2018). For example, greater

maternal ADHD symptomology corresponded with greater ADHD symptomology in sons. Similarly, mothers with greater BAP characteristics were more likely to have sons with greater ASD symptoms. Given this relationship—which has also been established in previous literature (Hurley et al., 2007; Maxwell et al., 2013; Sasson et al., 2013b)—it is surprising that a statistical comparison of BAP characteristics between mothers of children with and without ASD was not significant. In fact, mothers in the present study reported higher average BAP characteristics than has previously been cited in the literature, with mothers of sons with ASD reporting higher scores than other ASD samples and mothers of sons without ASD reporting higher scores than other community control samples (Maxwell et al., 2013; Sasson et al., 2013a). See page 48 for a discussion of these means and pages 63-64 for the current study means. These higher ratings may be attributable to recruitment efforts in this study, which resulted in recruitment of mothers from online parenting groups, including numerous ADHD parenting groups. Given significant correlations between ADHD and the BAP, this approach may have resulted in increased BAP traits across both groups—particularly for mothers of sons without ASD.

Parenting Practices and Mother-Son Symptomology

In the present study, child ASD symptomology was not related to maternal parenting practices. Furthermore, mothers of sons with and without ASD did not significantly differ in their use of positive and involve parenting or negative parenting practices. In fact, mothers in the present study—both with and without ASD—reported parenting scores on the APQ that paralleled those found in large community samples (e.g., Dadds et al., 2003; Elgar et al., 2007). These findings diverge from those of McRae et al. (2019), who found that mothers of children with ASD reported significantly less positive/involved parenting when compared to other documented large community samples. There are several likely explanations for this difference.

First, their sample was far more heterogenous as they included mothers and fathers as well as male and female children. Second, the majority of their participants were recruited from a psychiatric inpatient treatment facility, suggesting greater ASD severity. Third, they did not exclude children with cognitive delay and over 58% of the children in their study were attending special education classes. Conversely, the present study represents mothers of sons with ASD, without co-occurring cognitive impairment, who were largely recruited through community means, most commonly, social media.

Accordingly, researchers who used broader recruitment strategies (e.g., ASD associations, community recruitment) and similarly excluded families of children with an intellectual disability have also found little to no difference in positive parenting behaviours between mothers of children with and without ASD (e.g., Lambrechts et al., 2011; Maljaars et al., 2014). Furthermore, a recent meta-analysis by Ku et al. (2019) found that mothers of children with and without ASD did not significantly differ in parental support/warmth, or neutral parenting behaviours. They did find differences in controlling behaviours, where mothers of children with ASD displayed more controlling behaviours, but only when their child's developmental ability (e.g., child's IQ, mental age, language skills) was low. This finding underscores the importance of considering child developmental abilities in parenting outcomes.

In contrast to child ASD—which was not related to parenting behaviours—maternal BAP characteristics were predictive of both positive and negative parenting practices. Mothers with greater pragmatic language difficulties and aloofness endorsed greater use of negative parenting practices and less positive and involved parenting. Interestingly, pragmatic language problems were the BAP trait most highly related to parenting practices, suggesting that social language skills may be especially influential. These findings align with a recent study that found that

mothers with greater pragmatic language difficulties demonstrated less warmth during a mother-child interaction task (Rea et al., 2019).

Of course, the findings of the present study are correlational and cannot speak to causation. Still, it seems reasonable to posit that social disinterest and difficulties with verbal and nonverbal communication could interrupt maternal warmth, involvement, and communication within the parent-child relationship. For example, the APQ asks about frequency of attending school meetings, volunteering with extracurricular activities, praising child outcomes, initiating positive parent-child conversations, connecting physically (e.g., hugging, kissing), and communicating about consistent discipline and supervision expectations. Any of these behaviours—which rely heavily on social engagement and communication skills—could become challenging or uncomfortable for mothers who struggle with initiating, maintaining, and interpreting verbal/nonverbal interactions. Consequently, mothers struggling with these aspects of social connection may be more avoidant and less involved in their parenting approach. Indeed, in qualitative research, mothers with autism spectrum conditions have highlighted a number of social challenges encountered while parenting, including difficulties interacting with and feeling understood by teachers, parents, and other children during school and extracurricular activities (Winnard et al., 2021). Accordingly, some mothers have highlighted a desire to avoid such social situations, while also acknowledging the impact of their avoidance on their child's social functioning (e.g., not having play dates with friends). In alignment with these qualitative findings, Ingersoll and Hambrick (2011) found that maternal BAP characteristics were linked with greater use of maladaptive coping strategies, which included items on avoidant coping; however, they did not explore avoidant coping independently of other maladaptive strategies. There is also some emerging quantitative evidence that has linked parental ASD characteristics

with lower levels of involvement and satisfaction in the parent-child relationship (Dissanayake et al., 2020).

Beyond intentional avoidance, maternal aloofness and pragmatic language difficulties could also reduce awareness around when/how to provide support, supervision, and discipline to their children. This suggestion aligns with recent quantitative findings, where greater parental ASD traits (among a predominantly maternal sample) were correlated with increased parenting challenges, including difficulties with attending and connecting to their child, understanding their child's needs, modelling/teaching behaviours to their child, and regulating their emotions in parenting situations (Dissanayake et al., 2020); although, this research looked at total ASD traits using the Autism Spectrum Quotient and did not tease apart differences across the subdomains of ASD. Still, other researchers working with adult ASD populations have similarly argued that disinterest in social interaction and difficulties with social communication can disrupt day-to-day interactions and undermine the development of social relationships (Beffel et al., 2021; Lamport & Turner, 2014). Unfortunately, the literature in this area is quite limited and further exploration is needed to better clarify the relationship between maternal aloofness, pragmatic language difficulties, and positive/negative parenting practices.

In contrast to the other BAP traits, maternal rigidity was significantly correlated with negative parenting practices but not positive and involved parenting. Mothers who identified as more rigid were no more or less positive and involved in their parenting, but they were more likely to endorse using negative parenting practices. To some extent, it is surprising that greater preference for rules, routine, and structure corresponded with inconsistent discipline and poor supervision. Yet, comparable relationships between parental rigidity and inconsistency have also been discussed in other areas of study within the context of parental coercive cycles

(Lunkenheimer et al., 2016). Coercive cycles are created through parent-child interactions, where a parent's response to child misbehaviour can result in exacerbation and escalation of that misbehaviour, thus initiating the cycle (Patterson, 2002). Some have argued that parental rigidity, control, and efforts to produce compliance can actually result in an increase in child noncompliance, which may ultimately lead parents to fail to follow-through with initial disciplinary directives (Stormshak et al., 2000). Accordingly, coercive cycles have been linked with both increased rigidity and inconsistency in parental responding (see Lunkenheimer et al., 2016). Most recently, a large community-based study found that parental inflexibility and rigidity predicted higher levels of family discord and more reactive and inconsistent forms of parenting (Daks et al., 2020). Greater family rigidity has also been linked with increases in frustrating parenting interactions for mothers of children with ASD (Pruitt et al., 2016). While this hypothesis offers a promising explanation for the findings of the present study, direct research is needed to test whether this finding holds true within the context of the BAP, child ASD, and parenting outcomes.

Mother and son ADHD symptoms were also linked with negative parenting practices, but not positive parenting practices. This conflicts with some research that has found a significant negative relationship between maternal ADHD and positive parenting (e.g., Chronis-Tuscano et al., 2008), although a recent meta-analysis established that the effect of this relationship is negligible (Park et al., 2017). Consequently, Park et al. suggested that—should these findings be consistently replicated—perhaps parental ADHD symptoms may impact organizational and regulation aspects of parenting, but not positive parenting and warmth. Accordingly, the present study found that greater maternal ADHD symptomology corresponded with increased difficulties with organizational aspects of parenting (i.e., poorer supervision, inconsistent discipline). These

findings may relate to the influence of inattention and impulsivity, which could impact approaches to supervision and consistency in discipline. Indeed, previous research has found a positive link between maternal ADHD/inattention and inconsistent discipline (Chen & Johnston, 2007; Chronis-Tuscano et al., 2008), harsh parenting, and lax parenting (Park et al., 2017). That said, Woods et al. (2021) recently argued that maladaptive discipline approaches commonly associated with maternal ADHD may actually be better accounted for by deficits in maternal emotion regulation than core ADHD symptoms. Given that emotion regulation is a common deficit experienced in ADHD and ASD (England-Mason, 2020), it would be interesting for research to further explore the role of emotion regulation in the interactions between the BAP, ADHD, and negative parenting behaviours.

Given the findings discussed thus far—particularly regarding the links between maternal BAP, maternal ADHD, child ADHD, and parenting outcomes—it naturally follows that regression models involving these variables were predictive of positive and negative parenting behaviours. More specifically, maternal BAP/ADHD and child ASD/ADHD predicted positive and involved parenting and negative parenting practices, resulting in small to medium effects. This finding highlights the importance of considering both parent and child characteristics when researching parenting behaviour and supporting mothers in their parenting role. A similar argument can also be made for the influence of these traits on parenting stress outcomes.

Parenting Stress and Mother-Son Symptomology

In the present study, mothers of sons with ASD reported significantly greater levels of parenting stress than mothers of sons without ASD. Even regardless of diagnosis, a very large correlation was found between child ASD symptoms and parenting stress, where mothers of sons with greater symptomology reported significantly greater parenting stress levels. Similarly, child

ADHD symptomology was strongly correlated with parenting stress, as mothers of sons with greater ADHD symptomology reported experiencing significantly more parenting stress. These findings align with extensive literature on this topic (e.g., Craig et al., 2016; Miranda et al., 2015; van Steijn et al., 2014), supporting the conclusion that parents of children with greater ASD and/or ADHD symptomology are at much greater risk of experiencing stress within their parenting role.

Less studied in the literature, yet equally important to acknowledge, is the impact of maternal traits on parenting stress. In the present study, mothers with more BAP characteristics endorsed significantly higher levels of parenting stress. This finding aligns with the limited research in this area, which has similarly found a positive relationship between the BAP and parenting stress (Derguy et al., 2016; Ingersoll & Hambrick, 2011). However, these findings diverge from research by van Steijn et al. (2014), who found that parental ASD symptomology was related to increased parenting stress for fathers but not mothers of children with ASD. It is worth noting that van Steijn's study included children ranging from 2 to 20 years, reporting an average age of 12 years. It is possible that the relationship between the BAP/ASD and parenting stress may differ for older children and adolescents, though research would need to directly test this hypothesis.

Extending beyond past research in this area—which only looked at total BAP/ASD ratings—results from the present study highlight that parenting stress is also moderately correlated with each BAP subdomain individually, including aloofness, pragmatic language difficulties, and rigidity. It is certainly plausible that challenges with social communication, social disinterest, and rigidity could present additional obstacles to the task of parenting, which benefits from social connection, responsiveness, warmth, and flexibility (Hoffman et al., 2017;

Williams et al., 2012). For example, perhaps social disinterest and communication difficulties increase stressors relating to involvement in child extra-curricular activities, parent-teacher communication, responsiveness to child needs, or involvement in child interests and activities. Maternal rigidity may also increase stress if rules, routines, and schedules are not readily followed by their child or family. Indeed, mothers with autism spectrum conditions have described struggling with situations that require flexibility in managing change, unpredictability, and multi-tasking (Winnard et al., 2021). There is also some evidence to suggest that parental rigidity is most problematic when paired with disengagement, low cohesion and flexibility, and poor parental supervision, resulting in lower family satisfaction (Everri et al., 2016).

It has also been proposed that BAP traits increase parenting stress through resulting adaptive and maladaptive coping mechanisms. More specifically, Ingersoll and Hambrick (2011) found that the relationship between maternal BAP traits and parenting stress was mediated, at least in part, by greater use of maladaptive coping strategies such as avoidance and self-blame. They suggested that BAP traits like rigidity and social difficulties may bias parents towards the use of these strategies instead of more flexibly implementing adaptive emotion-focused or problem-focused strategies. Social coping mechanisms may also be implicated as some studies suggest that social supports serve as a mediator in the relationship between the BAP and parenting stress (Ingersoll & Hambrick, 2011; Lindsey & Barry, 2018). Through this pathway, the BAP has been linked with fewer social supports, and lower levels of perceived support has been found to predict increased caregiver distress and parenting stress levels. Ingersoll and Hambrick (2011) suggested that BAP traits might result in more interpersonal difficulties, thus reducing access to social support networks. Consequently, this reduced support places mothers at greater risk for struggling in response to parenting stressors. Collectively, these findings suggest

that BAP traits can increase barriers to coping within the parent-child relationship by increasing maladaptive approaches and decreasing access to social support, which subsequently places mothers at greater risk of heightened parenting stress.

Interestingly, social relationships have similarly been implicated in the relationship between the BAP and other mental health outcomes. More specifically, researchers have found that fewer social supports and lower relationship satisfaction mediate the relationship between the BAP and maternal depression (Ingersoll & Hambrick, 2011; Pruitt et al., 2018). Although, more recent research found that psychological flexibility and challenging parenting experiences more strongly mediated the relationship between the BAP and depression/anxiety in comparison to social supports (Kulasinghe et al., 2021). Given research that links parenting stress with depression and anxiety (e.g., Rezendes & Scarpa, 2011; van Steijn et al., 2014), it seems plausible that psychological flexibility and challenging parenting experiences may also be implicated in the relationship between the BAP and parenting stress; although, this assumption has yet to be investigated. Continued research in this area would help to further clarify the relationship between the BAP and maternal mental health outcomes, including parenting stress, depression, and anxiety.

Beyond maternal BAP characteristics, maternal ADHD also seems to be a contributing factor to parenting stress in the present study, where greater maternal ADHD symptomology predicted increased parenting stress. This finding is further supported by previous research (e.g., Theule et al., 2011; van Steijn et al., 2014). In conceptualizing these findings, those authors highlighted that maternal ADHD symptomology could interrupt key parenting responsibilities including organizing, coordinating child schedules, and managing competing family and household demands, thus resulting in increased parenting stress. In alignment with this

conclusion, Williamson and Johnston (2019) recently found evidence for a mediated relationship between ADHD and parenting stress, where maternal ADHD symptoms predicted poorer self-efficacy beliefs, which corresponded with increases in parenting stress. Interestingly, in the present study, maternal rigidity, pragmatic language difficulties, and overall BAP traits were stronger predictors of parenting stress than maternal ADHD. This finding suggests that the BAP—particularly rigidity and pragmatic language difficulties—may present an even greater hurdle to parenting than maternal ADHD, which could be due to demonstrated impacts on coping and establishing social support networks. However, few studies have collectively considered both the BAP and ADHD as predictors of parenting stress, and more exploration into the interactions between maternal ADHD/BAP and parenting stress is needed.

When taken together, it seems that *both* mother and child symptoms are important to consider when investigating mothers' parenting experiences and stress levels. Indeed, the present study found that maternal BAP and ADHD, child ASD and ADHD, and child age were all predictive of parenting stress levels, explaining over half of the variance in parenting stress. As such, it is important for research to continue exploring the transactional role of parent and child symptomology when working with ASD and ADHD populations, instead of focusing on the sole impact of child symptoms. This underscores the primary goal of the present study, which was to explore whether similarity-fit interactions explain the relationship between parent and child symptoms and parenting outcomes.

Similarity-Fit Findings

Within the present study, maternal BAP characteristics—including aloofness, pragmatic language difficulties, rigidity, and overall BAP—were consistently related to less positive and involved parenting, more negative parenting practices, and greater parenting stress. Child ASD

symptoms were also positively correlated with parenting stress levels but not with parenting practices. Though interesting, these results do not speak to the transactional nature of the parent-child relationship and the potential interaction between mother and sons' traits. The primary goal of the present study was to explore whether these parenting outcomes are moderated by the 'fit' between mother and son in terms of BAP traits and child ASD.

Based on the similarity-fit hypothesis, it was anticipated that child ASD would moderate the relationship between maternal BAP characteristics and parenting outcomes, where similarity between mother and son would result in a 'fit' that promotes positive outcomes. Contrary to this hypothesis, child ASD did not moderate the relationship between BAP characteristics and parenting outcomes. In fact, a collective of twelve regression analyses failed to support an interaction between core BAP traits (i.e., aloofness, rigidity, pragmatic language difficulties, total BAP) and parenting outcomes, including positive and involved parenting, negative parenting practices, and parenting stress. Similar results were also found in post-hoc regression analyses where the covariates (i.e., child age and mother/child ADHD) were removed, suggesting that the findings cannot be better attributed to highly interrelated ASD and ADHD variables and the resulting loss of power. Effectively, similarity-fit was not a fitting hypothesis for explaining parenting outcomes within the context of ASD and the BAP, as similarity in traits—where mothers of children with ASD had high BAP traits and mothers of children without ASD had low BAP traits—did not matter. Mothers *were not* more likely to report positive parenting outcomes (i.e., more positive and involved parenting, less negative parenting practices, less parenting stress) when their BAP traits aligned with their sons' ASD diagnostic status.

Instead, parenting stress may actually represent more of an additive model, where both maternal BAP *and* child ASD traits increase parenting stress levels for mothers. Under this framework, mothers of children with ASD who also have high BAP traits themselves would experience the greatest levels of parenting stress, while mothers of children without ASD who have low BAP traits would experience the lowest levels of parenting stress. As such, the overlap between child ASD and maternal BAP traits may actually intensify distress by multiplying barriers to parenting, rather than decreasing stress through shared understanding and structuring of the environment. In alignment with this framework, the present study found that parenting stress levels were significantly greater among mothers of sons with ASD and among mothers with higher BAP ratings—findings that also align with past research in this area (Craig et al., 2016; Derguy et al., 2016; Hayes & Watson, 2013; Ingersoll & Hambrick, 2011). Unfortunately, most research to date has focused more on child characteristics and no known studies have directly tested the applicability of an additive model of parenting stress. Further exploration of this hypothesis is necessary to better clarify the transactional relationship between mother and child symptoms and resulting parenting stress outcomes.

In contrast to parenting stress, parenting practices seem mainly related to maternal BAP traits, more so than child ASD symptomology. Indeed, mothers of children with and without ASD did not significantly differ in their use of positive and negative parenting practices. Furthermore, a continuous measure of child ASD symptomology did not correlate with parenting practices. This finding fits within a genetic etiological understanding of ASD rather than the parent-blaming 'refrigerator-mother' theories, as mothers of sons with ASD were no less warm and involved in their parenting approach than mothers of sons without ASD. While child ASD status did not seem to affect approaches to parenting, maternal BAP traits were linked with more

negative parenting practices for both mothers of sons with *and* without ASD. This finding is important as it highlights the necessity of considering the role of maternal characteristics—which are often overlooked—when developing parenting programs and supporting mothers of children with *and* without ASD.

This is the first known study to investigate the application of the similarity-fit hypothesis within the context of childhood ASD, maternal BAP, and parenting outcomes including positive/negative parenting practices and parenting stress. While the findings ultimately did not support the role of similarity-fit for ASD, it is worth noting that this study did not incorporate a direct measure of maternal ASD symptomology and was novel in its focus on the subclinical traits of the BAP. Of course, investigation of the BAP was intentional, as these subclinical characteristics are not only common among family members of individuals with ASD, but also continuously distributed throughout the general population (Wainer et al., 2011). By using the BAPQ, the present research was well positioned to explore the implications of broader autism traits in parent-child interactions for mothers, capturing the variability of traits across mothers and sons with and without ASD. Still, this approach diverges from past similarity-fit research in ADHD populations, which explored clinical symptoms of ADHD in both parents and children. While it is certainly possible that the results of this study could differ if maternal ASD were investigated instead of the BAP, it seems unlikely that the findings would lead to drastically different conclusions given that the BAP involves patterns of behaviour that are qualitatively similar to those seen in ASD and has commonly been investigated using ASD screening measures like the Autism Spectrum Quotient (Ingersoll et al., 2011). Furthermore, even though the constructs measured by the BAPQ are not identical to the core features of ASD, researchers have found that individuals with ASD score higher on the BAPQ than control samples

(Nishiyama et al., 2014a; 2014b). As such, it seems reasonable to suggest that the BAPQ should still capture the parent-child interactive patterns of mothers with clinically elevated ASD symptoms, although direct testing of this assumption would be valuable.

While the use of a subclinical maternal trait measure was novel, the parenting measures used in the present study (i.e., the APQ and PSI-4-SF) closely paralleled those used in past similarity-fit research with ADHD (Johnston et al., 2016; Perez Algorta et al. 2018, Psychogiou et al., 2007; 2008), where fit between mother and child symptoms has been established. Within this literature, parent-child ADHD symptomology has demonstrated an interactive impact on positive/negative parenting practices and parenting stress that supports a similarity-fit model. Yet, this model does not seem to apply when looking at interactions between maternal BAP and child ASD for these same parenting outcomes. Further strengthening this conclusion, post-hoc analyses supported ADHD similarity-fit within the present sample. Greater maternal ADHD symptomology predicted significant increases in negative parenting practices and parenting stress, but only for mothers of children without ADHD. This same trend was observed for positive and involved parenting, however the interaction effect did not reach significance.

Overall, the results suggest that dissimilarity between mother and son—where mothers had high ADHD symptoms but did not have a son with ADHD—resulted in worsened parenting outcomes, while similarity between mother and son—where both had low ADHD symptomology—corresponded with better outcomes, including less negative parenting and lower parenting stress. This same ‘fit’ pattern was also observed for mothers of children with ADHD, although the effects were not significant. Still, for mothers of sons with ADHD, greater maternal ADHD symptomology predicted less negative parenting practices and lower parenting stress. Interestingly, dissimilarity in symptoms for mothers of sons without ADHD resulted in nearly

identical parenting stress levels to mothers of sons with ADHD who similarly had high ADHD symptomology. This finding seems particularly interesting, given that child ADHD has been well-established as a strong predictor of parenting stress (Theule et al., 2012). These results underscore the importance of considering the bidirectional relationship between mother and son when studying ADHD and parenting stress, as mothers of children with or without ADHD can experience similar levels of parenting stress when they themselves have high ADHD symptomology.

The fact that ADHD similarity-fit applied within the present study also has interesting implications relating to comorbidity. Among this sample, approximately 40% of sons had ASD, half of whom also had co-occurring ADHD. Given high rates of comorbidity between ASD and ADHD, it is especially noteworthy that the similarity-fit hypothesis still seems to apply when autism symptoms are highly prevalent and controlled for in the sample. Furthermore, post-hoc analyses involving only sons with ASD revealed comparable similarity-fit trends; although, the interactions were not significant, which is likely attributable to the smaller sample size and resulting lower power. Still, this finding is interesting as it suggests that similarity in ADHD symptoms between mother and son remains important in ASD populations. Of course, replications of this finding through continued research with larger ASD samples would be beneficial to confirm and strengthen this interpretation.

Satisfaction with Support

To provide greater context and insight into the experiences of mothers in the present sample, each mother was asked to speak on their experiences with public and private supports. While exploration of support needs was not a primary objective of the present study, there are several important findings worth highlighting. First and foremost, mothers of sons with ASD

were far less likely to report their current support needs as being met compared to mothers of sons without ASD. Moreover, when asked to rank their satisfaction with current supports on a sliding scale, mothers of sons with ASD reported significantly lower levels of satisfaction than mothers of sons without ASD. Mothers of sons with ASD reported greater need for a wide range of clinical, educational, mental health, and funding resources, with numerous mothers describing barriers to access (e.g., wait-lists, finances, obstacles within the school system). Among the most commonly cited support needs was the need for respite services, highlighting the stress that many of these mothers are likely facing. This emphasis on respite might also be connected to the global pandemic, as many families of children with ASD were facing increased stressors during this period (Tokatly Latzer et al., 2021).

The fact that mothers of children with ASD reported greater dissatisfaction with current supports is particularly problematic, as unmet service needs—whether perceived or accurate—have been found to increase caregiver burden (see Desmarais, Barker & Gouin, 2018). Furthermore, well-coordinated services have been linked with positive psychological wellbeing for mothers (Hodgetts et al., 2016). In alignment with these findings, results from the present study indicate that lower ratings of support satisfaction correspond with significantly higher levels of parenting stress and poorer parenting practices. While these post-hoc analyses were exploratory in nature and this research did not incorporate a quantitatively rigorous measure of support satisfaction, these findings highlight key differences in support needs between mothers of sons with and without ASD and point to critical implications for maternal parenting practices and parenting stress levels. This is certainly an area of study that would benefit from continued investigation.

Study Strengths

This research builds upon a small but growing literature base looking at the bidirectional influence of ASD in the parent-child relationship. It is also among the first to consider the similarity-fit hypothesis within an ASD population through the lens of the BAP. As such, the results of this study help to address a significant gap in the ASD literature, where interactions between mother and child symptomology have often been overlooked. Efforts to address this gap are particularly important, given that both ASD and the BAP are more likely to be present among family members of individuals with ASD (Bolten et al., 1994; Lau et al., 2016; Losh et al., 2011; Maxwell et al., 2013), making their bidirectional influence especially relevant.

The present study also helps overcome other common gaps within the ASD literature. In particular, by considering the possible presence of BAP/ASD characteristics in mothers, this study challenges common stereotypes that presume ASD to be a childhood disorder—one that does not extend into adulthood and especially not into motherhood. By exploring the intersection between motherhood and broader autism traits, this study contributes to a narrative that acknowledges the very likely possibility that mothers share these traits with their child. This goal was also accomplished by seeking direct perspectives of a woman with ASD and mothers of children with ASD while pilot-testing the survey, which helped to ensure that study questions were effectively worded and study content was appropriate for this population. More broadly, consulting with women from the autism community was considered necessary for ensuring that this research is meaningful and useful for the population it serves.

This study also benefited from its strength-based approach to investigation, which is a perspective that is often emphasized but not employed in research due to a focus on deficits associated with clinical and subclinical ASD traits. Even though study findings did not support

the similarity-fit hypothesis for ASD/BAP traits, ongoing efforts to acknowledge both strengths and challenges and pursue strength-based questions remains imperative. Without these initiatives, underlying strengths may go unrecognized while deficits remain the common focus. Of course, this is not to invalidate the very real challenges that can result from certain autism characteristics, but instead to balance this perspective through recognition of both positive and negative outcomes.

There were also several noteworthy methodological strengths of the present study. Building upon past similarity-fit research, the present study used a similar methodological approach and consistent outcome measures that better allowed for comparisons to be drawn between similarity-fit in ASD versus ADHD populations. Given common difficulties with replication in the literature, it seems particularly relevant that ADHD similarity-fit was also established in the present study through the use of similar outcome measures.

This study was also aided by participation from a large sample of mothers of sons with and without ASD, who were relatively similar in demographic variables across both groups. In part, this homogeneity was promoted through stringent eligibility criteria, including screening based on gender, child age, biological relationship, and presence of intellectual disability. The large sample size, coupled with homogeneity on key demographic variables, enabled effective exploration of the relationships between key variables via multiple regression. The large sample size is particularly noteworthy, given that recruitment of these eligible mothers required participation of over 500 individuals during a global pandemic, where many mothers were simultaneously balancing increased family responsibilities and supporting children at home through virtual learning. Such widespread engagement in this study, particularly during this difficult global context, not only speaks to extensive efforts in recruitment but also the

importance of this topic for many mothers who are navigating parenting stressors in their daily life.

Study Limitations

Measurement

This study should be considered within the context of several measurement limitations. First, this study is restricted by its reliance on self/parent-report measures, as it introduces the potential for reporting bias as well as interference due to BAP traits. Indeed, some research has suggested lower sensitivity and specificity in self-report over informant report for the BAPQ (Hurley et al., 2007; Seidman et al., 2012). That said, informant ratings may also be conflicted by BAP traits—particularly in families of children with ASD where the BAP is just as likely present for spouses (Rubenstein & Chawla, 2018). Additionally, research with ASD populations has demonstrated that individuals with ASD—arguably experiencing greater difficulties with social communication than those seen with the BAP—are self-aware and can report self-perceptions with accuracy (Berthoz & Hill, 2005; also see Montgomery, 2007). It is also worth noting that in some instances, self-report and first-person perspectives are not only valuable but necessary, such as when assessing parenting stress—which is inherently grounded in self-perception.

Within the present study, greater self-report challenges seem to have arisen within the context of parenting behaviours and the APQ. In fact, several participants were excluded from analyses involving the APQ due to seemingly selective omission of some negative parenting items. Corresponding with this observation, several parents identified concerns relating to the negative parenting items at the end of the survey. For example, one mother of a son with ASD—who was excluded from this study due to survey incompletion—commented:

> I focus on the reasoning behind my son's behavior and not the behavior itself. I didn't answer many questions that I thought were inappropriate. My son and I work proactively to give him the support and accommodations that he needs he be successful. We talk and collaborate, we don't bribe and punishment. Punishment has no place in parenting children and obedience is not the goal.

This mother seems to be highlighting a fundamental preference for positive and involved parenting over negative discipline practices. It is unfortunate that she—and likely some other participating mothers—did not fully complete the APQ for these reasons, as their completion of this measure would contribute additional positive parenting data to the present study. This issue would be particularly concerning if mothers of children with ASD were more likely to selectively complete APQ items than mothers of children without ASD (or vice versa); however, this was not the case as both mothers of children with and without ASD were excluded at similar rates due to this issue. Moreover, mothers of children with and without ASD reported similar parenting scores on the APQ that also approximated ratings from other community samples (e.g., Dadds et al., 2003; Elgar et al., 2007). Still, future research would benefit from cautiously investigating parenting behaviours within this population by incorporating approaches that overcome such selection bias, such as qualitative investigation or in-person recruitment to ensure these concerns are addressed at the time of survey completion.

Beyond self-report concerns, several other measure-related limitations should be discussed. First, social support was investigated through exploratory post-hoc analyses in the present study but did not incorporate a psychometrically-validated measure of support. These analyses certainly highlight interesting differences in the support needs of mothers of sons with and without ASD, aligning with past research in this area. Yet, the results of these analyses were

exploratory in nature and should be interpreted cautiously. Instead of drawing definitive conclusions from these analyses, the findings from this study will hopefully prompt more thorough investigations into the role of social support in parenting outcomes and experiences for mothers of children with and without ASD.

Another measure-based limitation stems from the relative infancy of the BAP, which is still an emerging construct in the literature with no agreed upon golden standard for measurement. The BAPQ was chosen for the present study as it was specifically designed to assess the BAP and has demonstrated stronger psychometric properties compared to other common measures of the BAP (Ingersoll et al., 2011), including the Autism Spectrum Quotient (AQ; Baron-Cohen et al., 2001) and the Social Responsiveness Scale (SRS; Constantino, 2002). Still, the BAPQ is not without its limitations. In particular, only one known study has sought to validate the BAPQ or the Pragmatic Language Difficulties subscale with measures specific to language and communication. While examining a Spanish version of the BAPQ, Godoy-Giménez et al. (2018) recently found convergent evidence with the Pragmatic Awareness Questionnaire, but they also found that the Pragmatic Language dimension contributed to misfit in the BAPQ-Model. Their findings also aligned with some Pragmatic Language cross-loading items observed by Sasson et al. (2013a). Accordingly, other researchers have posited that pragmatic language items may reflect overlapping constructs such as aloofness by incorporating items like *I feel disconnected or 'out of sync' in conversations with others* (Smith, 2018). While other research supports retention of a three-factor model of the BAPQ—with three separate theoretically-derived scales (i.e., pragmatic language difficulties, aloofness, and rigidity; Ingersoll et al., 2011)—it seems more research is needed to clearly capture the construct validity of the pragmatic language difficulties scale. As such, the findings of the present study should be

considered with this limitation in mind. Still, the BAPQ offers a promising metric for investigating subclinical ASD characteristics and effectively enabled investigation of broader social-communication challenges and behavioural rigidity among mothers in the present study.

Recruitment

It is important to note that recruitment and data collection took place during the global Covid-19 pandemic, which introduced unanticipated challenges for the present study. Primarily, the pandemic was declared after recruitment had begun, precluding the inclusion of questions relating to the pandemic and its effects on maternal wellbeing and parenting outcomes. This is particularly problematic as the impact of the pandemic varied widely based on numerous factors including geographical location and timing. Given that recruitment took place across North America and over the span of a year, it is difficult to determine how mothers were differentially impacted by the pandemic and resulting local policies at the time that they completed the study (e.g., school closures, virtual schooling, work-from-home policies, unemployment, community resource stoppages). Furthermore, mothers of children with ASD likely experienced unique stressors compared to mothers of children without ASD. For example, a recent qualitative study found that parents of children with ASD faced difficulties with sudden routine changes and transitions, limited space for their child to expend energy, worsening of their child's food selectivity/restrictivity, and social/developmental regressions due interruptions in social activities and therapeutic care during the Covid-19 pandemic lock-down (Tokatly Latzer et al., 2021). The authors of this study also highlighted more positive child coping outcomes when parents were better able to accommodate and adapt to their child's needs and approach situations from a positive and creative outlook, which could suggest implications for maternal BAP characteristics and rigidity in particular. Unfortunately, it is unclear how these issues might have impacted

mothers who participated in the present study. For this reason, future research is needed to explore the relationship between parent/child characteristics and parenting outcomes while accounting for differences in pandemic-related stressors.

Analyses

The implementation of twelve separate regression analyses has implications for the present study, as the use of multiple comparisons can increase the chance of making a type I error and thus finding a significant result due to chance (Lawson et al., 2021). Statistical corrections can help control for this issue through reducing alpha, yet this solution also presents challenges by reducing power to detect a significant finding and increasing the chance of achieving a false negative (Greenland, 2021). While it is certainly important to consider the implications and limitations of employing multiple comparisons, this issue seems less problematic for the present study, as even when using a less conservative alpha of .05, none of the primary hypotheses in the present study were significant. For interested readers who would prefer to take a more conservative approach, the exact *p*-values for each analysis have been outlined in the results section.

Generalizability

The sample in this study was limited to mothers of boys who did not have co-existing cognitive deficits. Decisions relating to gender and cognitive functioning were made logistically to address concerns around sample recruitment, power, and homogeneity. While the chosen sample eligibility criteria aligned with the objectives of the present study, it also limits generalizability of the results. For example, the findings of this study do not necessarily extend to fathers, daughters, or parents of children with cognitive deficits. Mothers were primarily White, which limits the generalizability of these findings to individuals from similar racial

backgrounds. Additionally, Canadians—and Manitobans in particular—were overrepresented in this study, which limits the generalizability of these findings beyond these regions. While the present study findings largely speak to Canadian (and Manitoban) experiences, it is worth noting that the results still align with other similarity-fit research which has included broader Canadian and British samples (Johnston et al., 2016; Psychogiou et al., 2007; 2008).

Beyond these issues, study analyses also did not account for the role of common comorbidities in parent and child psychopathology (e.g., depression, anxiety), which could have important implications for interactions between mother and son; although, this was beyond the scope of the present study. Fortunately, a primary goal of this study was to spark further research in this area, which could expand to exploring similarity-fit and parent-child ASD interactions among fathers, daughters, children with cognitive impairments, parents and children with comorbid psychopathologies, as well as families from diverse racial, cultural, and geographical backgrounds.

Implications

Research Implications

As the first known study to explore maternal BAP characteristics and child ASD through a similarity-fit lens, this exploratory research offers several noteworthy and novel contributions to the literature. First and foremost, it seems that the similarity-fit hypothesis—though pertinent for ADHD populations—does not predict the same parenting outcomes within an ASD sample. It is certainly interesting that similarity-fit did not account for interactions between maternal BAP and child ASD, while still predicting interactions between maternal and child ADHD. These findings further strengthen the growing literature base on parent-child fit in ADHD populations, while also extending the applicability of the similarity-fit hypothesis to a sample in which autism

symptoms were highly prevalent and controlled for. This is an exceptionally novel and necessary contribution to the literature, given that many children with ADHD also have co-occurring ASD symptomology that may be contributing to parent-child interaction dynamics.

The findings of this study also prompt the need for ongoing discussions surrounding parent-child interactions within ASD populations, as similarity in traits between mother and son does not seem as essential. In fact, the findings of the present study more closely suggest an additive effect for parenting stress, where both maternal BAP and child ASD contribute to increased parenting stress levels. The results also highlight a greater role for maternal BAP traits than child traits in both positive and negative parenting approaches. These are interesting findings that certainly warrant further exploration and validation, particularly given the ongoing gap in the ASD literature with respect to consideration of maternal BAP/ASD traits. Unfortunately, though parenting stress is one of the most researched parenting variables within the field of ASD, researchers have generally focused on the role of child ASD while overlooking the influence of maternal BAP/ASD characteristics and the likely interaction between mother and child traits. This oversight has been previously highlighted as a significant limitation of the current literature (Pisula & Porębowicz-Dörsmann, 2017). The results of the present study help to address this gap while also further underscoring the necessity of accounting for the traits of both child *and* parent when investigating parenting outcomes in ASD populations. Ultimately, it no longer seems sufficient to compare the experiences of mothers of children with and without ASD without acknowledging the likely role of maternal BAP or ASD traits for many of these mothers.

Clinical Implications

This research is also well positioned to advance existing clinical perspectives on parent-child relationships and experiences of motherhood within the context of ASD, the BAP, and ADHD. Most importantly, the fact that maternal BAP and ADHD characteristics were consistently implicated in parenting outcomes highlights the importance of considering maternal symptomology when supporting children with ASD and ADHD. The potential additive nature of maternal BAP characteristics and child ASD for parenting stress is particularly noteworthy, as it places mothers of children with ASD who have greater BAP characteristics at the highest risk of experiencing significant parenting stress. Should these findings be replicated through continued investigation, the results could imply a need for targeted resources and support for mothers of children with ASD who identify with greater BAP traits or ASD symptomology. Mothers with greater BAP traits were also more likely to report less positive parenting practices, further emphasizing the need for resources and supports that account for broader subclinical parental traits.

Unfortunately, clinical treatment recommendations are often based on conceptualizations of child symptomology without accounting for the individualized needs of the parent. Additionally, the literature on child interventions and parental BAP remains sparse, yet there is some emerging evidence for the value of tailoring interventions for mothers of children with ASD who exhibit BAP characteristics. For example, a recent case study by Furukawa and Eyberg (2019) found support for tailoring a parent-mediated intervention for children with ASD to meet the needs of a mother with BAP traits who was initially struggling to learn and apply child-directed interaction skills (e.g., behaviour descriptions and reflections; imitation; labelled praise; and avoidance of commands, questions, criticisms). The researchers found that the

provision of visual aids via handouts—which addressed difficulties with social pragmatic language, generalizing across situations, and following child behaviour—corresponded with noticeable improvements in the mother's understanding and application of the skills, which seemed to lead to improved outcomes for the child. Flippin and Watson (2018) also argued for coaching models that account for the unique social communication needs and strengths of parents with BAP characteristics, suggesting that this could improve fidelity and effectiveness. Through their research, they found that maternal aloofness was linked to maternal verbal responsiveness (in parent-child interaction), child-initiated engagement, and child language skills. They also found that maternal rigidity corresponded with child-initiated engagement and language skills. In reflecting on these findings, they recommended that parents with aloof BAP characteristics may benefit from supports that build verbal responsiveness by explicitly teaching shared focus of attention and modelling of responsive language. They also advised that parents with greater rigidity could benefit from coaching that helps build flexibility in behavioural responses to better encourage child engagement and language learning. Of course, rigorous intervention research is needed to further strengthen these conclusions. Still, this research highlights a promising direction for clinical practice whereby ASD interventions are not only tailored to the needs of the child, but also to the needs of the parent.

The value of acknowledging both parent and child factors in intervention is also imperative for families of children with ADHD. Within ADHD populations, it seems particularly important to consider (dis)similarity in symptomology between mother and son, as the fit seems as essential, if not more so, than whether or not the child or mother have ADHD. In fact, mothers of neurotypical children may be just as in need of clinical supports as mothers of children with ADHD if they themselves have ADHD, resulting in a misfit in symptomology with their child.

This knowledge can help inform the focus and implementation of clinical interventions for children and/or parents with ADHD by capitalizing on the role of parent-child fit (Johnston et al., 2016). Additionally, there is value in this strength-based perspective for fostering the engagement of mothers who have ADHD. For example, mothers with ADHD may be encouraged by the understanding that their own symptomology can be an asset when parenting children with ADHD. Mothers may also value the opportunity to learn how to cope with the challenges that maternal ADHD symptomology can present when parenting a neurotypical child.

More broadly, this research underscores the value of screening for maternal ADHD and BAP characteristics in mothers who refer for mental health services due to heightened parenting stress or parenting challenges—even if their child does not have a clinical diagnosis of ADHD or ASD. Similar conclusions were drawn by Perez Algorta et al. (2018), who found that maternal ADHD symptomology resulted in parenting stress levels similar to those experienced by mothers raising a child with ADHD. Ultimately, when working with mothers who are struggling within the parenting role, clinicians need to consider the role of maternal psychopathology and subclinical characteristics, as these factors may not only contribute to ongoing challenges in the parent-child relationship but may also present barriers to effective parent-led or family-based treatments.

Community and Policy Implications

From a balanced framework that acknowledges both strengths and challenges, this research can help to inform policy makers and community organizations on directions for supporting parents and children within ASD and ADHD communities. This goal seems particularly important given that self- and parent-report ratings of the BAP, ASD, and ADHD accounted for over half of the variance in parenting stress for mothers in the present study.

Furthermore, compared to mothers of children without ASD, mothers of children with ASD reported lower satisfaction in feeling their support needs were being met and identified greater need for resources like respite, mental health supports, clinical supports, and additional school/learning support. Lower satisfaction with supports was also largely correlated with increased parenting stress. These findings convey a core need for public funding and initiatives that target families of children with ASD and ADHD *as well as* parents (with or without ASD, BAP, or ADHD characteristics) who are in need of individualized parental supports.

A similar perspective has been shared by other researchers, who have emphasized that services should not only focus on children with ASD, but also on the support needs of family members. For example, Desmarais et al. (2018) recently highlighted that family-focused public support initiatives are important to help address issues commonly experienced by families within the ASD population, including increased parenting stress and difficulties navigating behaviour challenges. In their review of the literature on service access for families of children with ASD, these authors highlighted the potential value of family centered services, parent-to-parent support groups, community and parent-based psychoeducation opportunities, and school-based interventions to further reduce strain on these families. They also emphasized a need for working with families to offer coordinated care across systems, flexible respite options, services that span into adulthood, and greater financial support. These support initiatives align with the concerns and challenges raised by mothers in the present study, further strengthening the notion that gaps in service access are a reality faced by many ASD families. Policies that contribute to funding and improve access to these types of initiatives are important for building a strong foundation of support to help these families thrive.

One final, yet important, implication to highlight is that this research challenges common narratives surrounding ASD, which can spark broader change in how the ASD community is viewed and supported. For example, by focusing on motherhood—and consequently acknowledging the role of ASD and BAP characteristics among mothers—this study defies dominant stereotypes that presume ASD as bound to male and child populations. This narrative has been problematic as it limits our understanding of ASD and overlooks the experiences of girls, women, and mothers. While the present study explored broader characteristics through the BAP, it serves to initiate a conversation around ASD characteristics and motherhood, hopefully sparking further research, influencing policy initiatives, and highlighting gaps in public funding and resource access for this population.

This study is not only positioned to spark discussion around the experiences of women and mothers in the ASD community, but also challenge historical perspectives of motherhood in ASD populations through direct exploration of parenting approaches. As previously outlined, mothers of children with ASD were found to be no less warm and involved in their parenting practices than mothers of children without ASD. Furthermore, mothers of children with ASD reported parenting scores that paralleled those found in other large community samples (e.g., Dadds et al., 2003; Elgar et al., 2007). These findings underscore the importance of not biasing clinical decisions with assumptions or judgments about the parenting abilities of mothers of children with ASD—who have historically been labeled as ‘refrigerator mothers.’ Ongoing research and knowledge translation efforts that demonstrate maternal warmth and involvement among ASD populations are absolutely essential to counter the impact of early parent-blaming perspectives and to build further trust with clinical and public authorities. This study contributes

to a growing literature that can ultimately help reduce stigma among mothers in the ASD community and increase openness to seeking help and support when needed.

By studying broader subclinical traits along a continuum, this research may also help to reduce persisting stigma through an understanding of ASD as a spectrum of characteristics that extend beyond diagnostic labels. These traits vary from mild to severe and are not limited to individuals with ASD and their families, but also distributed throughout the community. Indeed, researchers have suggested that dimensional conceptualizations—that consider symptomology along a continuum instead of categorically—can help to reduce stigma (Corrigan, 2007). Continued efforts to explore the BAP may broaden public perception and encourage the perspective that these characteristics—like other traits—have an underlying genetic nature and are not inherently problematic. Some people—among ASD and neurotypical populations—just prefer greater structure, rules, and alone time. Even for individuals with clinically elevated ASD traits, there is value in recognizing trait-related strengths, avoiding over-pathologizing ASD characteristics, and focusing instead on ways to support and accommodate individuals with ASD. This perspective is supported by the social model of disability, which—unlike the medical model—views disability as a consequence of unaccommodating social structures instead of centralizing the individual through a sole focus on diagnostic labels and impairment (see Manago et al., 2017). While it is also important to acknowledge the true difficulties that people with ASD experience—as is done with the medical model—it is certainly a worthy goal to broaden public perceptions, reduce stigma, challenge assumptions, and build a society that accommodates people with diverse strengths and challenges. Ongoing investigation and knowledge translation on the BAP can help us in this objective by reducing division and building a bridge between ASD and neurotypical communities.

Future Directions

A key implication of these findings is that it sparks numerous directions for future investigation. For example, there is certainly greater need for investigation into the role of the BAP and parental ASD in parent-child relationships. In particular, the findings of this study illuminate directions for further exploration into the potential of an additive model of parenting stress as well as the underlying factors that link BAP characteristics with poorer parenting practices and parenting stress. There is also a need for exploration of these relationships in relation to parental ASD symptomology, which would help to clarify whether parent-child outcomes relating to the BAP similarly apply within the context of clinically-elevated ASD symptomology. Additionally, this area of research would benefit from a more rigorous exploration of the role of social supports in these parent-child interactions, as mothers of children with ASD reported significantly less satisfaction with their current support needs being met.

This study also highlights several directions for similarity-fit research. Perhaps most importantly, post-hoc analyses suggest that ADHD similarity-fit trends still apply for children with comorbid ASD, although the sample size of the present study did not provide adequate power to achieve significance among an ASD-only sample. Future similarity-fit research would benefit from continuing to investigate the role of comorbidities that commonly co-occur, like ADHD and ASD. Should future findings replicate the results of the present study, the argument for similarity-fit would be further strengthened and its applicability would expand to represent a larger proportion of families within the ADHD community. It would also be valuable to further explore the overlapping and diverging symptoms between ADHD and ASD that may contribute to differences in similarity-fit findings. It is particularly curious that—even with common difficulties with emotion regulation and executive functioning—fit in the parent-child

relationship seems more important within the context of ADHD than ASD/BAP. Future research would benefit from more explicit efforts to investigate the role of emotion regulation and executive functioning within this relationship. Given the relative infancy of this area of research, similarity-fit investigations with ADHD and ASD families should also continue to explore child outcomes as well as other parenting outcomes to better outline the implications of parent-child fit or misfit in these populations.

The objectives of this study were novel within the field of ASD, resulting in the decision to include a relatively homogenous sample. This decision allowed for effective investigation into key study questions but does limit the scope of the study. As such, it is important for future research to continue broadening the exploration of parent-child dynamics and symptomology by working with other populations, including research with both mothers and fathers, sons and daughters, and children with co-existing cognitive delays. Additionally, it would be beneficial for future research to explore the role of other common comorbidities in parent and child psychopathology (e.g., depression, anxiety) within the similarity-fit interaction. This was beyond the scope of the present study, but would be a natural route of further investigation, as co-occurring psychopathology has previously been implicated in parenting outcomes for families of children with ASD (Rezendes & Scarpa, 2011; Pruitt et al. 2018; van Steijn et al., 2014).

Conclusions

This study extends the similarity-fit literature by advancing support for the role of similarity-fit between mothers and sons with/without ADHD, while also demonstrating that this model does not apply to the same parenting outcomes within the context of child ASD and maternal BAP characteristics. Instead, it seems that both mother and child ASD/BAP traits corresponded with increased parenting stress, suggesting the possibility of an additive impact.

Conversely, parenting practices were linked with maternal BAP traits but not with child ASD symptomology. Greater maternal BAP ratings corresponded with poorer parenting practices. While the similarity-fit hypothesis was not confirmed within the context of the BAP and ASD, exploration of maternal BAP characteristics and parenting experiences in the present study contributes to a small but growing literature base and helps to address large gaps in knowledge regarding the transactional nature of ASD/BAP symptomology in the parent-child relationship. As such, this study is well positioned to incite future research that continues to investigate the experiences of mothers with ASD and BAP characteristics. This objective seems particularly important, given the historical and continuing lack of focus on women's issues in ASD populations.

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Appendix A

Recruitment Materials

Research Opportunity:

Researchers at the University of Manitoba are looking for

Mothers of children 6-11 years old

What is the Study About?



The purpose of this study is to learn about the strengths, parenting experiences, and family needs of families of children **with and without** Autism Spectrum Disorders (ASD). In this study you will be asked to complete a survey on parenting, your family, as well as yours and your child's development and characteristics.

Why Participate?

By taking part in this study, your contribution will help to improve the lives of families with a child with ASD and allow clinicians to more effectively implement parent-child intervention program. You will also be entered to win one of ten **$50 Amazon eGift Cards**!

To Participate in this Study:

- Click on the link below to open a new browser
  https://umanitobapsych.az1.qualtrics.com/jfe/form/SV_1RFE23ZPifneXwp
- Or find a link to the survey on our webpage at
  https://fdpl.ca/participate/

- This will lead you to a survey that will take approximately 30-45 minutes to complete

If you are interested in participating in this research project
and would like to learn more please email
Dr. Jen Theule at jen.theule@umanitoba.ca or call 204-474-7417

Please feel free to share this information with anyone else you think might be interested!

University of Manitoba

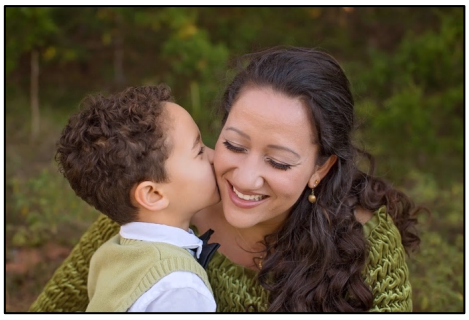
fdpl.ca FAMILY AND DEVELOPMENTAL PSYCHOPATHOLOGY LAB

Research Opportunity:

Researchers at the University of Manitoba are looking for

Mothers of children with ASD 6-11 years old

What is the Study About?



The purpose of this study is to learn about the strengths of families of children with Autism Spectrum Disorders (ASD), as well as their parenting and family needs. In this study you will be asked to complete a survey on parenting, your family, as well as yours and your child's development and characteristics.

Why Participate?

By taking part in this study, your contribution will help to improve the lives of families with a child with ASD and allow clinicians to more effectively implement parent-child intervention program. You will also be entered to win one of ten **$50 Amazon eGift Cards**!

To Participate in this Study:

- Click on the link below to open a new browser
- This will lead you to a survey that will take approximately 30-45 minutes to complete

https://fdpl.ca/participate/

If you are interested in participating in this research project
and would like to learn more please email
Dr. Jen Theule at jen.theule@umanitoba.ca or call 204-474-7417

Please feel free to share this information with anyone else you think might be interested!

University of Manitoba

fdpl.ca
FAMILY AND DEVELOPMENTAL
PSYCHOPATHOLOGY LAB

Research Opportunity:

Researchers at the University of Manitoba are looking for

Mothers of boys 6-11 years old

What is the Study About?

The purpose of this study is to learn about the strengths and parenting experiences of families. In this study you will be asked to complete a survey on parenting, your family, as well as yours and your child's development and characteristics.



Why Participate?

By taking part in this study, your contribution will help to improve the lives of families and allow clinicians to more effectively provide parent-child support. You will also be entered to win one of ten **$50 Amazon eGift Cards**!

To Participate in this Study:

- Click on the link below to open a new browser
  https://umanitobapsych.az1.qualtrics.com/jfe/form/SV_1RFE23ZPifneXwp
- Or find a link to the survey on our webpage at
  https://fdpl.ca/participate/
- This will lead you to a survey that will take approximately 30-45 minutes to complete

If you are interested in participating in this research project
and would like to learn more please email
Dr. Jen Theule at jen.theule@umanitoba.ca or call 204-474-7417

Please feel free to share this information with anyone else you think might be interested!

University of Manitoba

fdpl.ca FAMILY AND DEVELOPMENTAL PSYCHOPATHOLOGY LAB

Organization Email Recruitment Blurb:

Dear [Organization],

My name is _____, and I am part of a team of researchers at the University of Manitoba, working under the supervision of Dr. Jen Theule. We are conducting a study, and are looking for mothers of sons, between 6-11 years of age, with and without Autism Spectrum Disorders who are interested in completing a brief online survey investigating the strengths of these families as part of a new and exciting study! We are wondering if you would be willing to assist us with our recruitment efforts and either send out a recruitment email on our behalf to your members/contacts or circulate a poster about our study around your organization?

Any assistance you may be willing to provide would be greatly appreciated!

Sincerely,

_____

[full professional signature with the university of Manitoba and a phone number]

Parent Email Recruitment Blurb:

Dear Participant,

We are seeking to recruit mothers of sons with and without Autism Spectrum Disorder (ASD) to participate in an online survey regarding the parent-child relationship and family functioning. The purpose of this study is to gain insight into the strengths of these families and any ways we can further support families.

If you are interested in participating, please use the link below to complete the survey by [Due date for completion]. If you agree to participate in this study, you will be asked to complete a survey on parenting, your family, as well as yours and your son's development and characteristics. The entire survey will take 30-45 minutes to complete. Your responses will be anonymous and confidential.

As a thank-you for participation, you will be able to enter a draw for one of ten $50 Amazon eGift Cards.

Thank you for considering participation in this research project. You are also welcome to share this study with anyone else you think might be interested. Your assistance and time are greatly appreciated!

Please feel free to contact Dr. Jen Theule via email (jen.theule@umanitoba.ca) or phone (204-474-7417) for more information.

Social Media Advertisement:

Researchers at the University of Manitoba are looking for mothers of children (boys or girls), between 6-11 years of age, with Autism Spectrum Disorders who are interested in completing a brief online survey investigating the strengths of these families as part of a new and exciting study!

You can participate by clicking or copying the following link:

https://umanitobapsych.az1.qualtrics.com/jfe/form/SV_1RFE23ZPifneXwp

For more information about this opportunity, please contact Dr. Jen Theule at Jen.Theule@umanitoba.ca

You can also visit our website for more information about our past and present research activities at www.fdpl.ca. Feel free to share this notice with others who may be interested!

Appendix B

Demographic Questionnaire

Please Note:
This demographic questionnaire is a sample template. Some of these questions were worded and branched to fit the responses of each participant (e.g., a parent responding about a child without ASD was not asked to discuss subsequent ASD diagnostic information).

General Demographics:

Q1 What is your gender?
- ❍ Male
- ❍ Female
- ❍ I do not identify with the genders listed above
- ❍ I prefer not to answer

Q2 What is your age? _____

Q3 What is your marital status?
- ❍ Single
- ❍ Common-law
- ❍ Married
- ❍ Separated/divorced
- ❍ Widowed

Q4 What is your average household income?
- ❍ 0-40k
- ❍ 40-60k
- ❍ 60-90k
- ❍ 90-125k
- ❍ 125k+

Q5 What ethnicity do you identify with?
- ❍ Asian
- ❍ Black
- ❍ Indigenous
- ❍ White
- ❍ Other (please specify) _____

Q6 What country do you currently live in?
- ❍ Canada
- ❍ United States
- ❍ Other (please specify) _____

Q7 What state, province, or territory do you currently live in (please specify)?
Please specify: _____

Q8 How did you hear about this survey?
- ❍ Social Media (e.g., Facebook, Twitter) (please specify) _____
- ❍ Webpage Posting (please specify) _____
- ❍ ASD Service Organization (please specify) _____
- ❍ Community posting (e.g., in school, community centre, doctor's office) (please specify) _____
- ❍ Participation in previous research (please specify where) _____
- ❍ U of M Participant Subpool
- ❍ Other (please specify) _____

ASD/ADHD Demographics:

Q9 Have you ever received a diagnosis of autism spectrum disorder (or Asperger's Disorder, Autistic Disorder, Pervasive Developmental Disorder Not Otherwise Specified)?
- ❍ Yes
- ❍ No

Q10 What autism spectrum diagnosis have you received?
Please specify: _____

Q11 Who did you receive this diagnosis from?
- ❍ Family physician
- ❍ Paediatrician
- ❍ Psychiatrist
- ❍ Clinical Psychologist
- ❍ School Psychologist
- ❍ Other (please specify) _____

Q12 At what age were you diagnosed with ASD?
Please specify: _____

Q13 Have you ever received a diagnosis of attention-deficit/hyperactivity disorder (or attention-deficit disorder)?
- ❍ Yes
- ❍ No

Q14 Who did you receive this diagnosis from?
- ❍ Family physician
- ❍ Paediatrician
- ❍ Psychiatrist
- ❍ Clinical Psychologist
- ❍ School Psychologist
- ❍ Other (please specify) _____

Q15 At what age were you diagnosed with ADHD/ADD?
Please specify _____

Child Demographics

Q16 How many children do you have?
- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ >5

Q17 Do you have a child between 6 and 11 years of age?
- ❍ Yes
- ❍ No

Q18 How old is your child between 6 and 11 years of age? (if more than one son in this age range, please check multiple)
- ❍ 6
- ❍ 7
- ❍ 8
- ❍ 9
- ❍ 10
- ❍ 11

Q19 Do you have a child (aged 6-11) who has been diagnosed with autism spectrum disorder (or Asperger's Disorder, Autistic Disorder, Pervasive Developmental Disorder Not Otherwise Specified)?
- ❍ Yes
- ❍ No

Q20 How many of your children (age 6-11) have been diagnosed with autism spectrum disorder?
- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ >4

NOTE:

To allow for parents to adequately respond to questions and measures, parents were prompted to consider the following questions based on a target child using Qualtrics formatting and branching. The following guidelines were used:

a) Child aged 6-11 (in families with no children with ASD) **OR** *oldest* child age 6-11 (in families with no children with ASD)
b) Child with ASD aged 6-11 (in families with one child with ASD) **OR** *oldest* child with ASD aged 6-11 (in families with more than one child with ASD)

Parents were prompted to create a deidentified nickname to assist with orienting the questions towards the target child:

Please provide a nickname for this child. Try to pick something that will help you, but won't identify the child to others (e.g., "Pumpkin," "Little Man," or you can use your child's first and middle initial).

Target Child Diagnostic Questions

Q21 How old is _____? _____

Q22 What month was _____ born in? _____

Q23 What is your relationship to _____?

- ❍ Biological mother
- ❍ Adoptive mother
- ❍ Foster mother
- ❍ Step-mother
- ❍ Other (please specify) _____

Q24 How many days a week does _____ live with you?

- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ 7

Q25 What autism spectrum diagnosis has _____ received?
Please specify _____

Q26 Who diagnosed _____ with autism spectrum disorder?

- ❍ Family physician
- ❍ Paediatrician
- ❍ Psychiatrist
- ❍ Clinical Psychologist
- ❍ School Psychologist
- ❍ Other (please specify) _____

Q27 How old was _____ when he/she was diagnosed with autism spectrum disorder?
Please specify_____

Q28 Has _____ been diagnosed with attention-deficit/hyperactivity disorder (or attention-deficit
disorder)?

- ❍ Yes
- ❍ No

Q29 Who diagnosed _____ with attention-deficit/hyperactivity disorder (or attention-deficit disorder)?

- ❍ Family physician
- ❍ Paediatrician
- ❍ Psychiatrist
- ❍ Clinical Psychologist
- ❍ School Psychologist
- ❍ Other (please specify) _____

Q30 How old was _____ when he/she was diagnosed with attention-deficit/hyperactivity disorder (or attention-deficit disorder)?
Please specify _____

Q31 Has _____ been diagnosed with an intellectual disability (and/or ID, developmental delay, global developmental delay, mental retardation, cognitive disability)?

- ❍ Yes
- ❍ No

Q32 Who diagnosed _____ with an intellectual disability?

- ❍ Family physician
- ❍ Paediatrician
- ❍ Psychiatrist
- ❍ Clinical Psychologist
- ❍ School Psychologist
- ❍ Other (please specify) _____

Q33 Has _____ been diagnosed with any of the following mental health or developmental conditions?

- ❍ Anxiety Disorder
- ❍ Obsessive Compulsive Disorder
- ❍ Depression
- ❍ Specific Learning Disability (reading, writing, and/or math, also known as dyslexia, dyscalculia)
- ❍ Social (Pragmatic) Communication Disorder
- ❍ Language Disorder
- ❍ Developmental Coordination Disorder
- ❍ Feeding Disorder (e.g., avoidant/restrictive food intake disorder)
- ❍ Oppositional Defiant Disorder
- ❍ Conduct Disorder
- ❍ Other: _____

Q 34 Use the sliding scale below to rank how well you feel your support needs for your child/family are being met:

Qualitative Questions:

Q1. What supports are you currently receiving (paid for by yourself, the education system, health care funding, or other government sources)?

Q2. What supports do you feel you need?

Q3. If you wish, please feel free to use the space below to report on any of your personal experiences with parenting.

Q4. Is there anything else you would like to add?

Appendix C

Survey Measures and Time Commitment

Measure	Number of Items	Time Commitment
Demographic Questionnaire	28 (Including branched items)	5 - 7 Minutes
Ages and Stages Questionnaire: Third Edition (ASQ-3): 60 Month Questionnaire, Communication Subtest (Squires & Bricker, 2009)	6	2 - 3 Minutes
Broad Autism Phenotype Questionnaire (BAPQ) (Hurley et al., 2007)	36	10 Minutes
Barkley Adult ADHD Rating Scale-IV (BAARS-IV): Current Symptoms Scale (Barkley, 2011)	27	5 – 7 Minutes
Autism Spectrum Quotient—Child Version (AQ-C) (Auyeng et al., 2008)	50	10 – 15 Minutes
ADHD Rating Scale-IV (Dupaul et al., 1998)	18	5 Minutes
The Parenting Stress Index–4—Short Form (PSI–4 –SF) (Abidin, 2012)	36	10 Minutes
Alabama Parenting Questionnaire (APQ) (Frick, 1991)	42	10 – 12 Minutes
Parental Reflective Functioning Questionnaire – Adolescent Version (Luyten, Mayes, Nijssens, & Fonagy, 2017)	18	5 Minutes
Parenting Styles and Dimensions Questionnaire (PSDQ) (Robinson, Mandleco, Olsen, & Hart, 2001)	32	5 - 7 Minutes

Appendix D

Consent Form



Principal Investigator:
Dr. Jen Theule
University of Manitoba, Department of Psychology
Email: Jen.Theule@umanitoba.ca

This consent form, which you may print for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

Who you will be working with:
This study is being conducted by Dr. Jen Theule, along with graduate students Michelle Ward, Brenna Henrikson, and Karis Cochrane. If you have questions about the survey at any time, you may email Dr. Jen Theule at Jen.Theule@umanitoba.ca.

What we are trying to do:
The purpose of this study is to gain insight into the relationship between mothers and their children with and without autism spectrum disorders (ASD).

You can help if:
You are a mother of a child (or children) between the ages of 6 and 11 ***with or without*** an ASD diagnosis.

How you can help:
If you agree to participate in this study, you will be asked to complete a survey regarding parenting, your family, as well as yours and your child's development and characteristics. It is anticipated that the entire survey will take approximately 30-45 minutes to complete.

Benefits of helping:
For helping with this study, you are **eligible to receive a summary of the results**. Additionally, you will have the opportunity to be entered in a **draw for one of ten $50 Amazon eGift Cards**. After completing the survey, a link will be available in a new web browser where you may provide your email address for each of these opportunities.

What you need to know:

- Participation in this study is voluntary.
- You may complete the survey all at once or save your responses and come back to complete the survey at any time.
- You do not have to answer any questions that you don't want to answer for any reason. Further, if you begin the survey and then decide not to finish, you may leave the survey at any time. Any responses collected before leaving, however, will be recorded and may be used as data. The database containing anonymized study data will be stored for an indefinite period, as the study data may be useful for future analyses.
- This study will not request any form of self-identification, so **your responses to this survey will remain anonymous**. Your survey will be coded with a number to ensure confidentiality, and we will not ask you for your name to preserve confidentiality.
- When presenting our findings, your responses will not be identifiable; in most cases, the results from all participants will be grouped. As an exception, we may report quotes from some open-ended questions. These quotes will be anonymized and untraceable to the participant.
- The results of this research study may be presented through various outlets, such as conferences and academic journals.

By clicking "I agree to participate in this research study", you are saying that you understand the information outlined above about taking part in this research project and are agreeing to participate in this study. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from this study at any time, for any reason, and you are free to refrain from answering any questions you prefer to omit, without prejudice or consequence. You will still have an opportunity to enter the draw for an Amazon gift card if you do not finish the survey. Any responses you provide before withdrawing, however, will be recorded and used as data. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation. Should you choose not to participate, do not click "I agree to participate in this research study" and close the web browser.

The University of Manitoba may look at the research records to see that the research is being done in a safe and proper way.

This research has been approved by Psychology/Sociology Research Ethics Board. If you have any concerns or complaints about this project, you may contact the Human Ethics Coordinator at 204-474-7122 or by email at humanethics@umanitoba.ca. We encourage you to print a copy of this consent form for your records.

Appendix E

Debriefing Information



Thank you for your participation in this survey. Your time is greatly appreciated!

Your answers will help us better understand the experiences and perceptions of mothers of children with and without ASD in terms of their parent-child relationships and family functioning. We are particularly interested in how (a) mother's similarities with their children, (b) mother's thoughts about their children, and (c) mother's parenting styles relate to parenting stress, parenting, child behaviors, and family quality of life in families of children with and without autism spectrum disorders. Your contribution today will help to improve the lives of families and allow clinicians to more effectively implement parent-child intervention programs!

Click here if you would like to receive a summary of the results of this survey and have a chance to enter the draw for a $50 Amazon eGift card.

A new web browser window will open where you may provide your email address. The email address that you provide will not be linked to your survey responses. The summary of the results of this research project will be emailed to you by the end of December 2020.

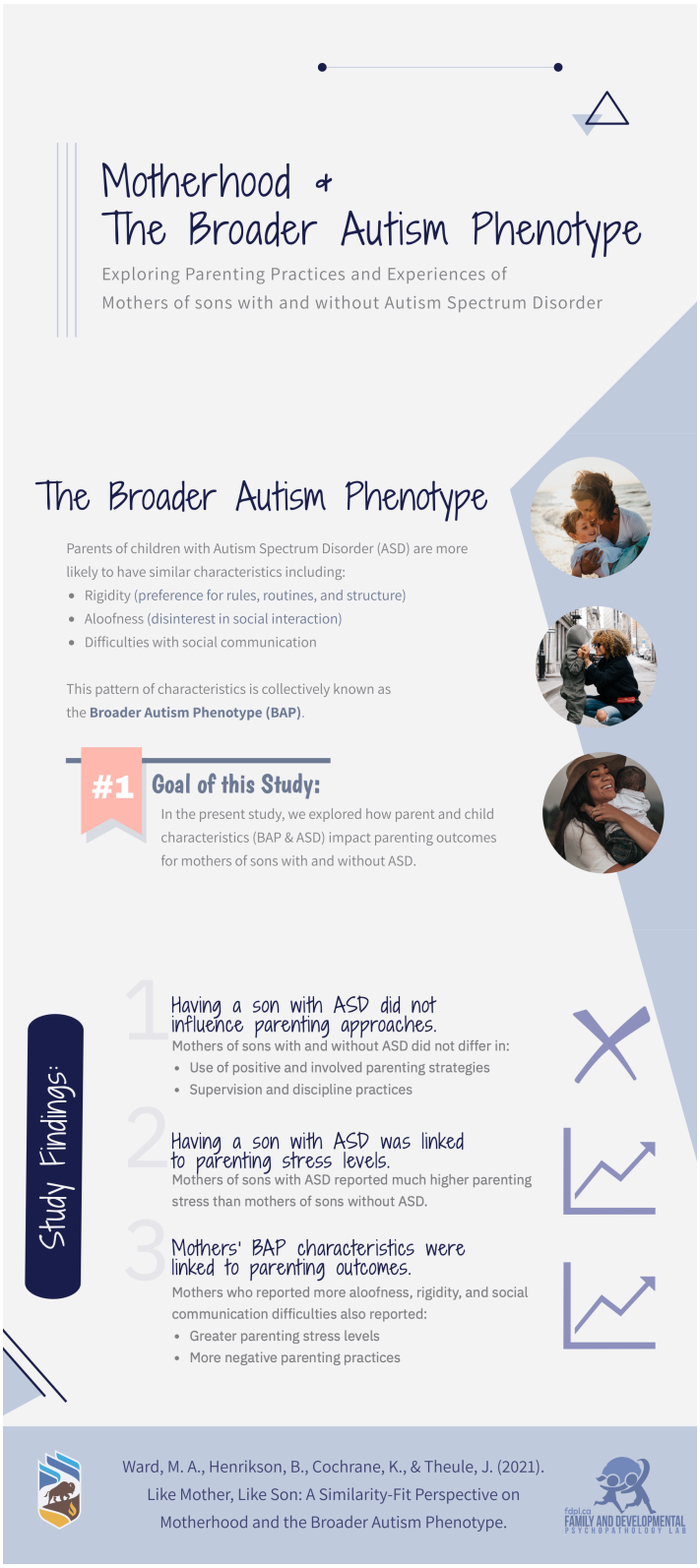
If you have questions regarding your participation in the study or have other questions about the study, please contact Dr. Jen Theule at Jen.Theule@umanitoba.ca

The nature of the survey you just completed may cause some individuals to experience negative emotions. If you feel that you are requiring psychological services, please see below for a list of resources:

- **Government of Canada mental health support:** https://www.canada.ca/en/public-health/services/mental-health-services/mental-health-get-help.html
- **National Institute of Mental Health resources:** https://www.nimh.nih.gov/health/find-help/index.shtml
- **American Psychiatric Association mental health resources:** https://www.psychiatry.org/patients-families
- **Canadian Mental Health Association resources :** https://cmha.ca/document-category/mental-health

Appendix F

Survey Infographic Results Summary



Appendix G

Assumptions Testing

Research Question 1:

Figure G-1.1

Research Question 1 – Normality Histogram

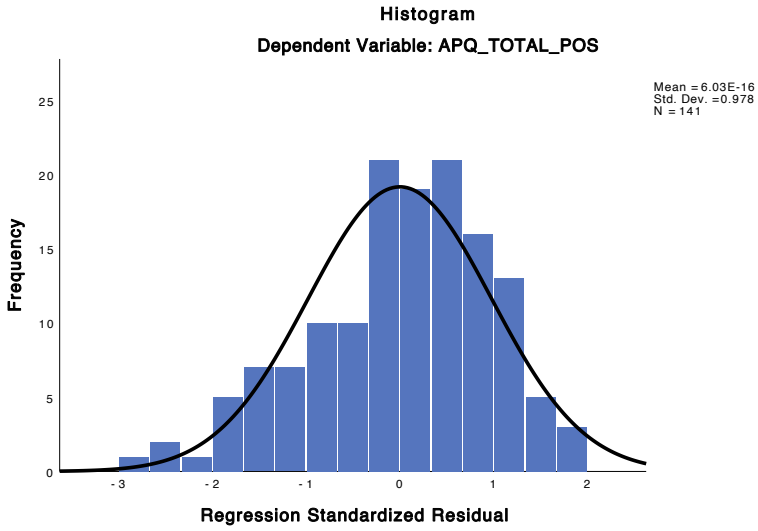


Figure G-1.2

Research Question 1 – Normal Probability Plot

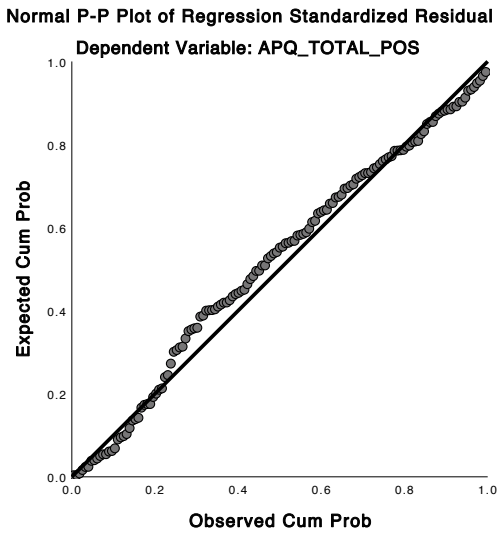
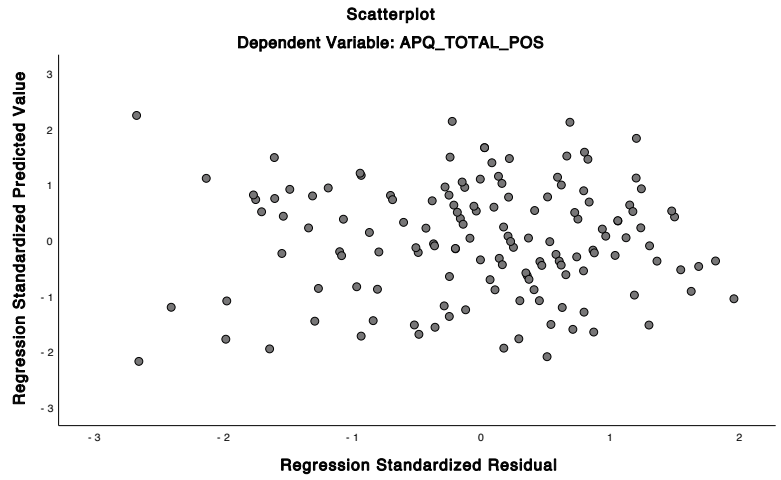


Figure G-1.3

Research Question 1 – Standardized Residual Plot



Research Question 2:

Figure G-2.1

Research Question 2 – Normality Histogram

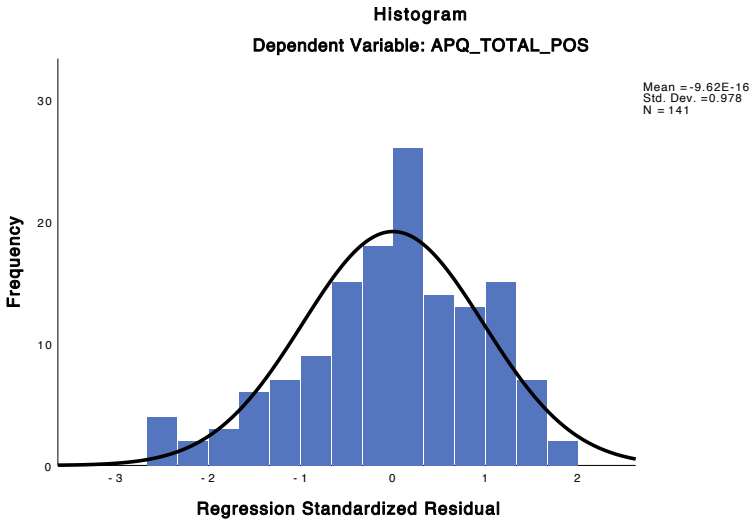


Figure G-2.2

Research Question 2 – Normal Probability Plot

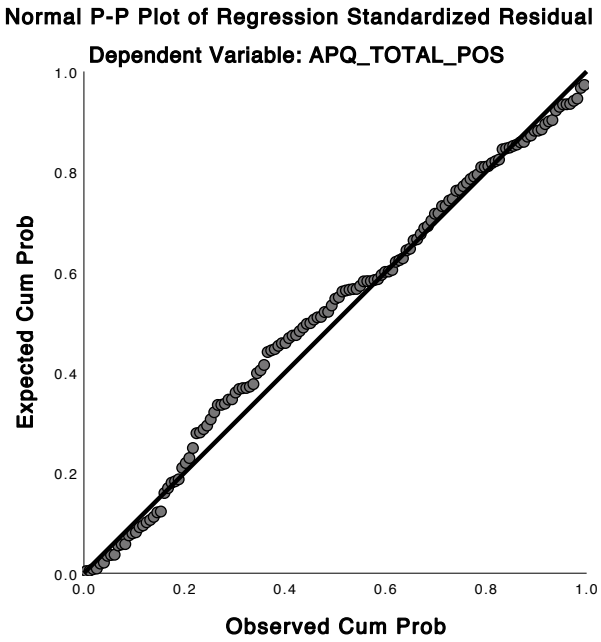
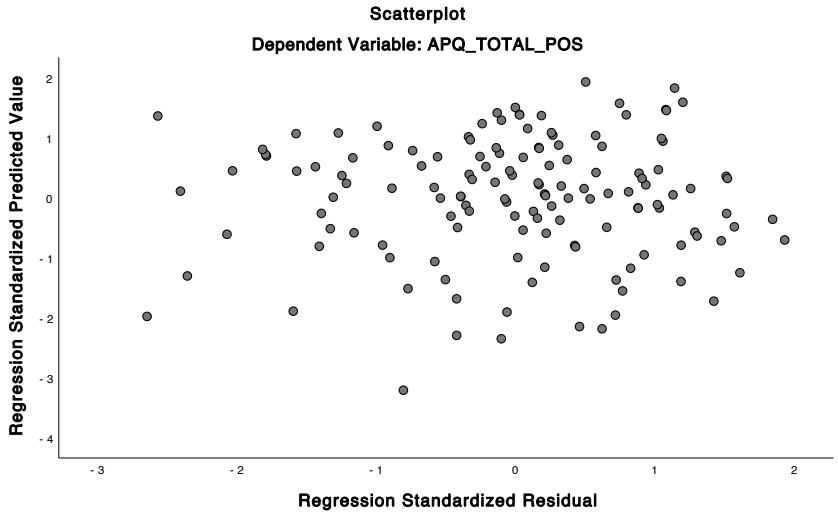


Figure G-2.3

Research Question 2 – Standardized Residual Plot



Research Question 3:

Figure G-3.1

Research Question 3 – Normality Histogram

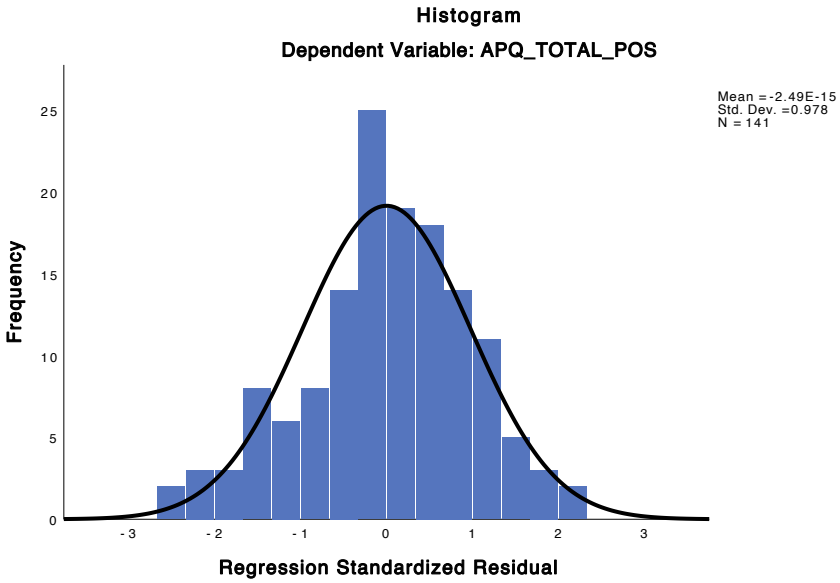


Figure G-3.2

Research Question 3 – Normal Probability Plot

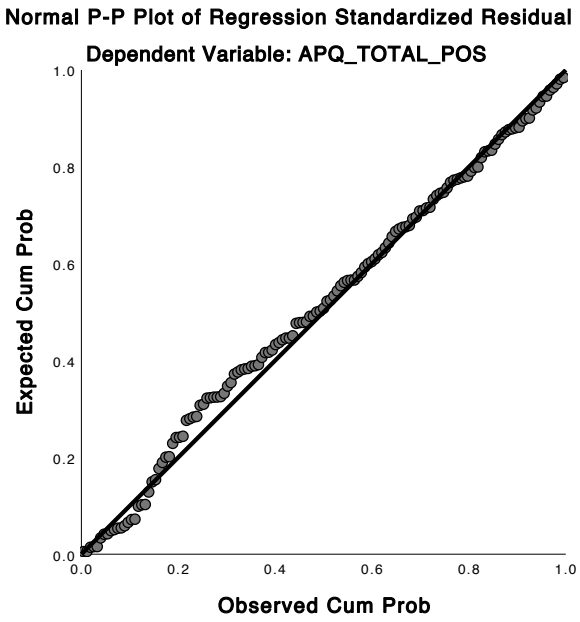
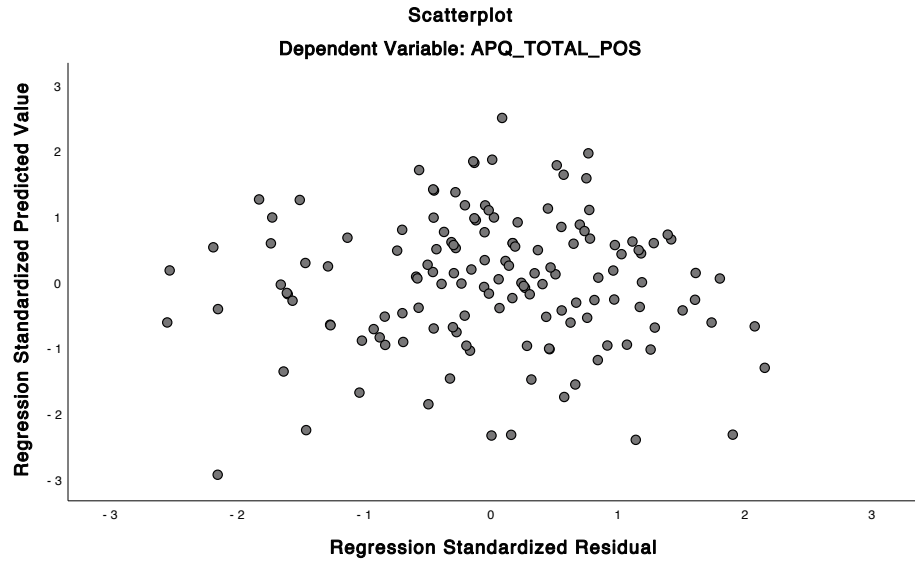


Figure G-3.3

Research Question 3 – Standardized Residual Plot



Research Question 4:

Figure G-4.1

Research Question 4 – Normality Histogram

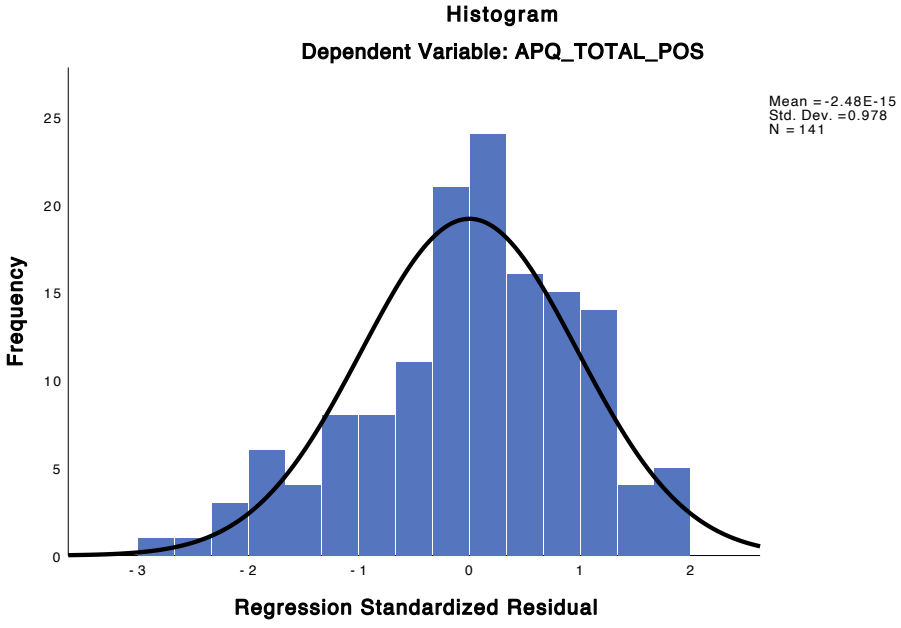


Figure G-4.2

Research Question 4 – Normal Probability Plot

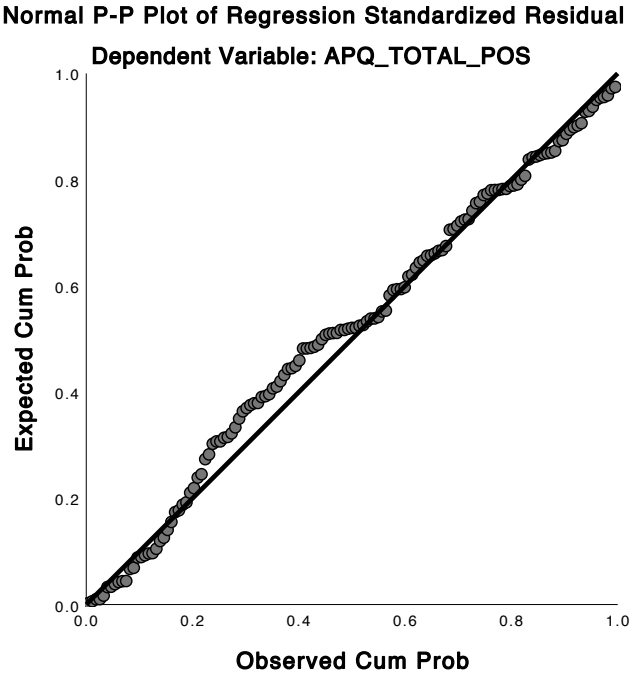
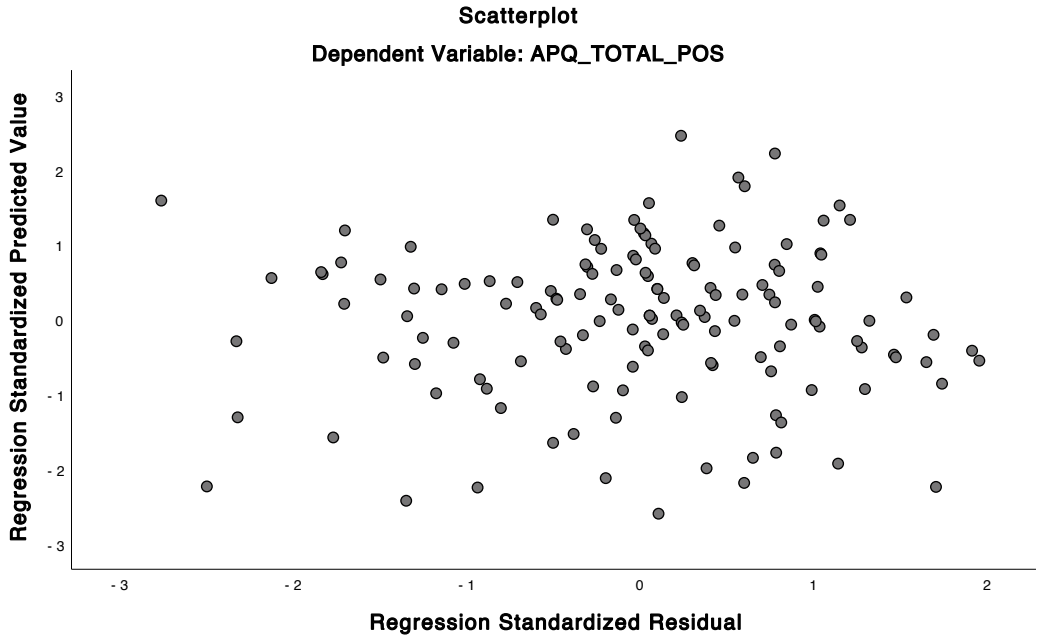


Figure G-4.3

Research Question 4 – Standardized Residual Plot



Research Question 5:

Figure G-5.1

Research Question 5 – Normality Histogram

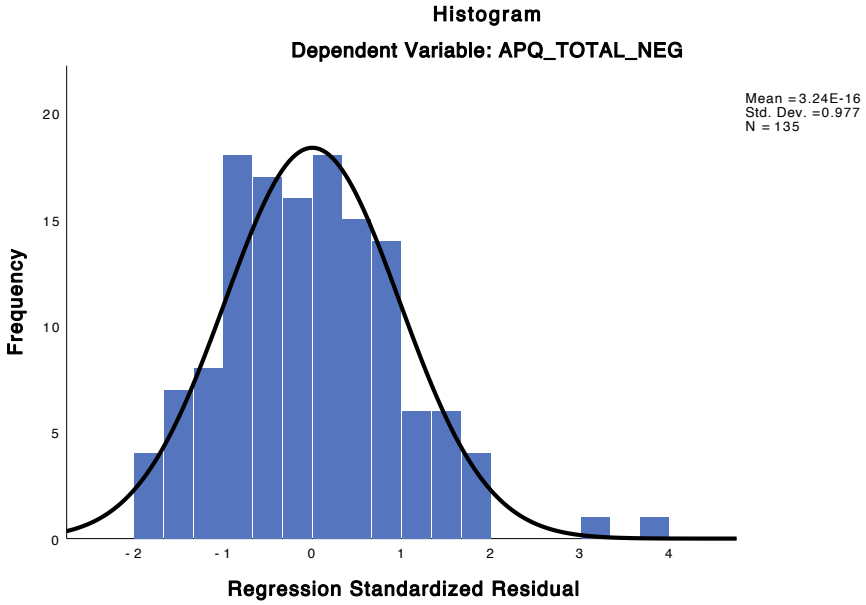


Figure G-5.2

Research Question 5 – Normal Probability Plot

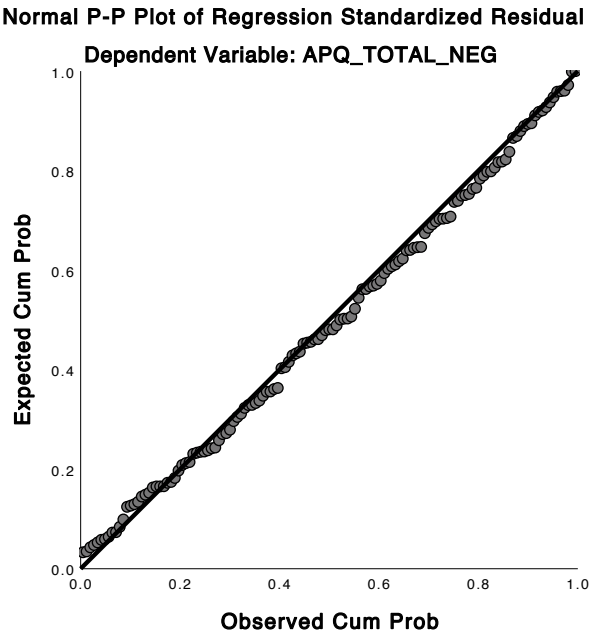
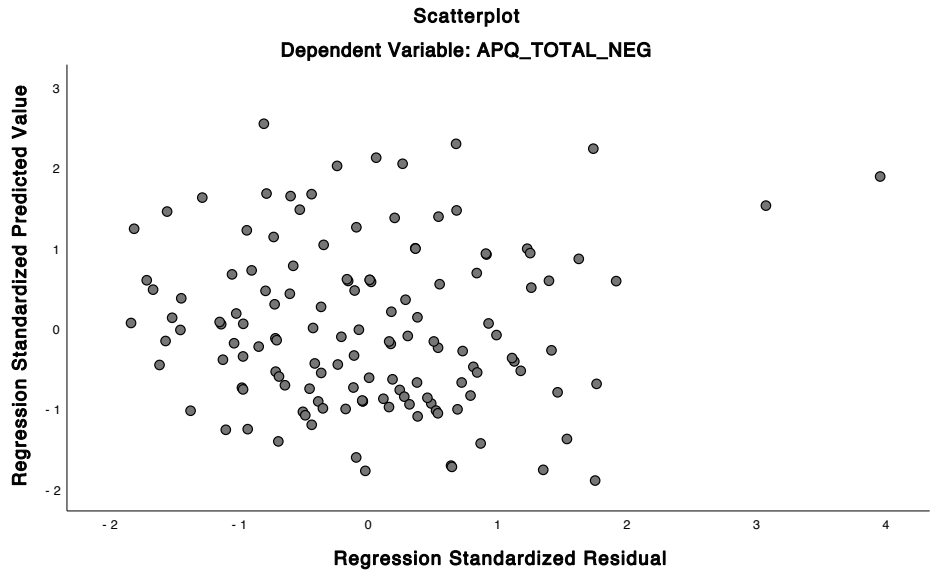


Figure G-5.3

Research Question 5 – Standardized Residual Plot



Research Question 6:

Figure G-6.1

Research Question 6 – Normality Histogram

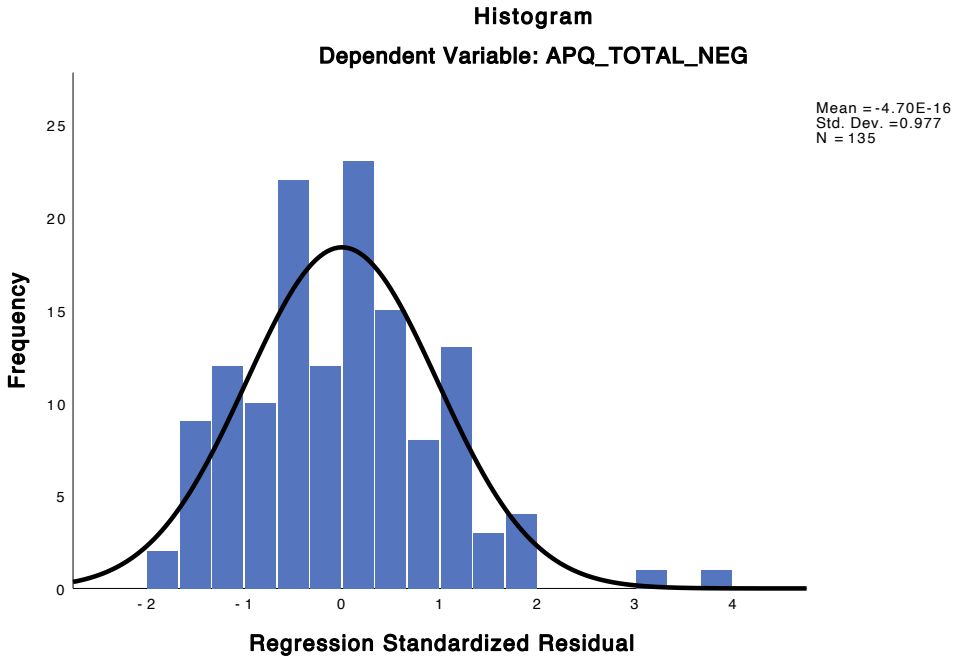


Figure G-6.2

Research Question 6 – Normal Probability Plot

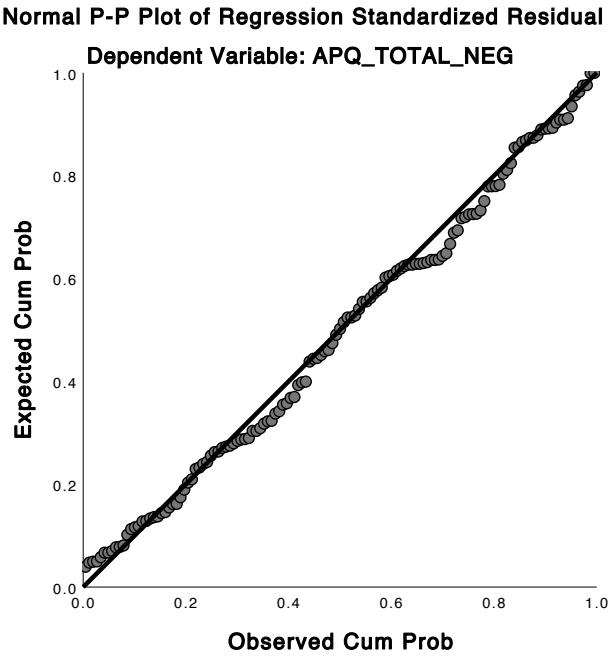
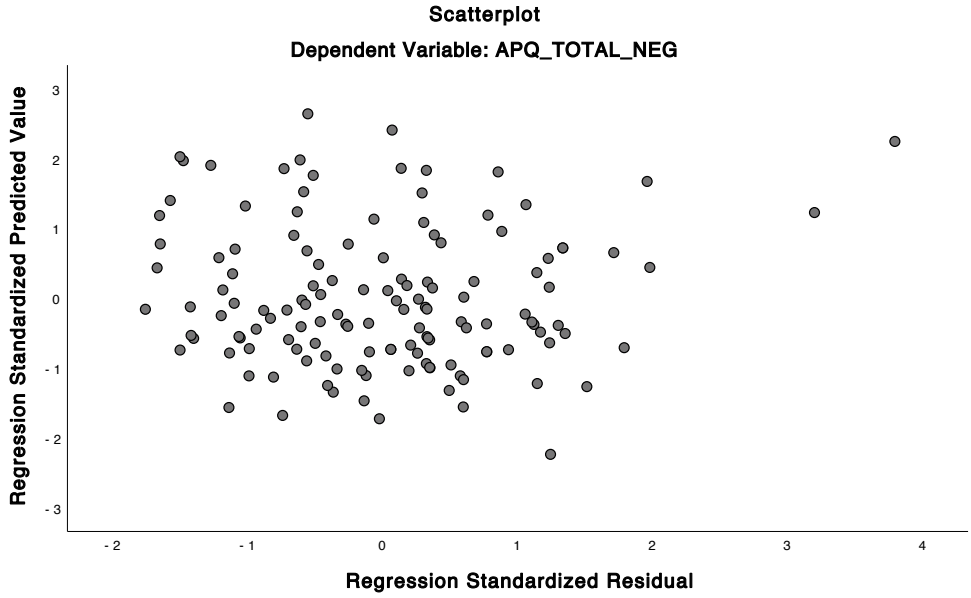


Figure G-6.3

Research Question 6 – Standardized Residual Plot



Research Question 7:

Figure G-7.1

Research Question 7 – Normality Histogram

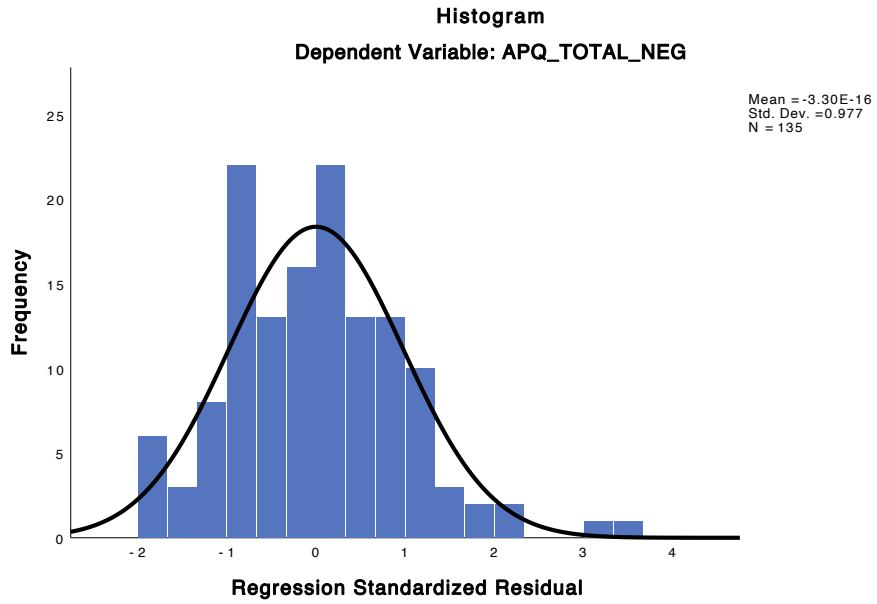


Figure G-7.2

Research Question 7 – Normal Probability Plot

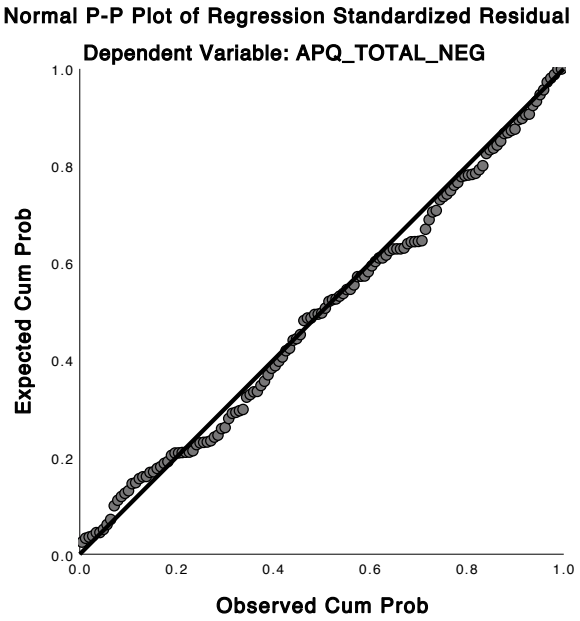
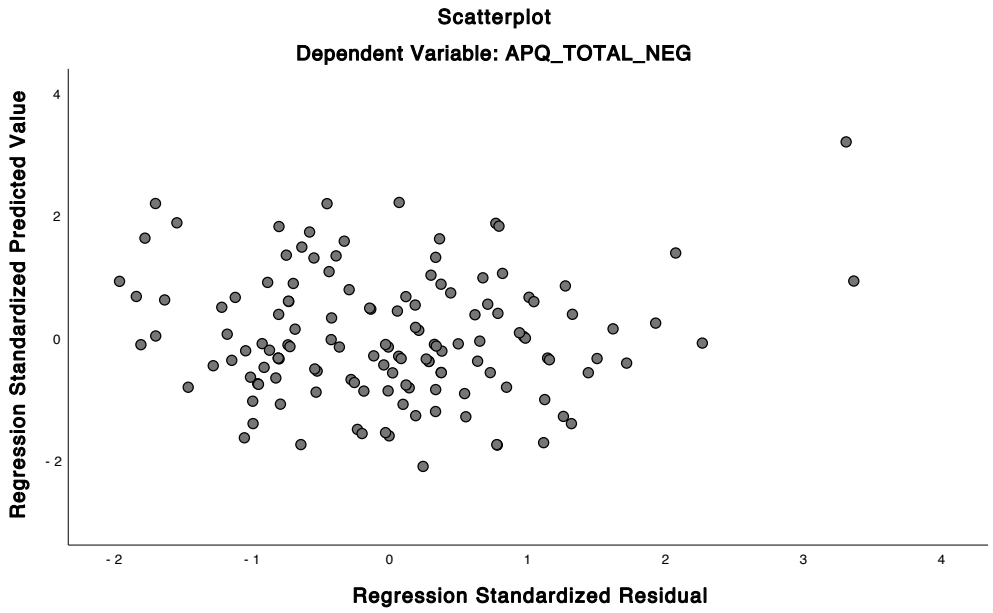


Figure G-7.3

Research Question 7 – Standardized Residual Plot



Research Question 8:

Figure G-8.1

Research Question 8 – Normality Histogram

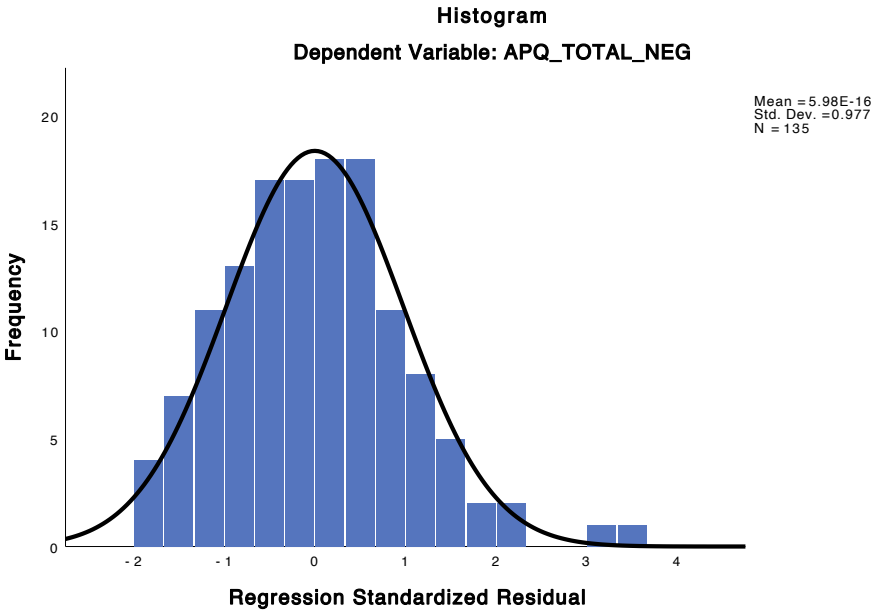


Figure G-8.2

Research Question 8 – Normal Probability Plot

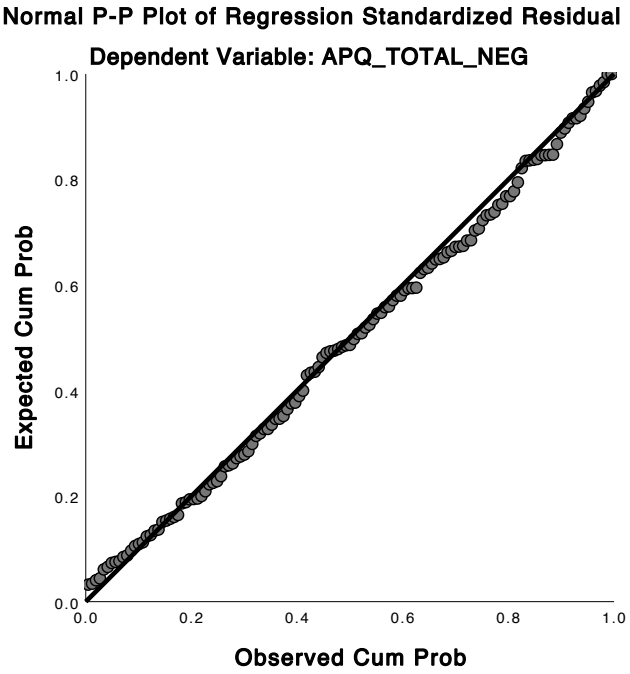
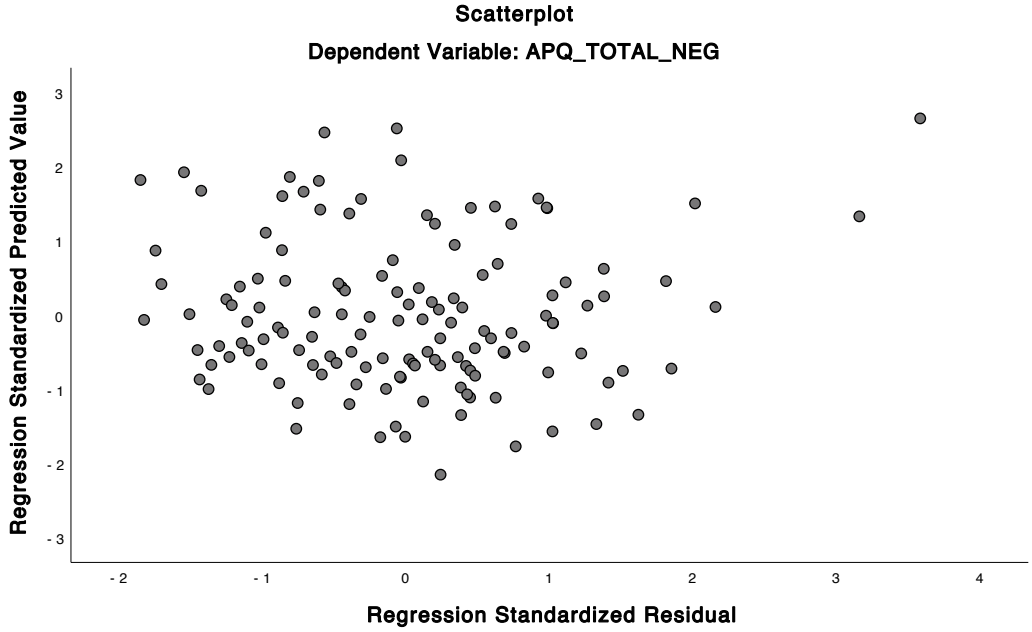


Figure G-8.3

Research Question 8 – Standardized Residual Plot



Research Question 9:

Figure G-9.1

Research Question 9 – Normality Histogram

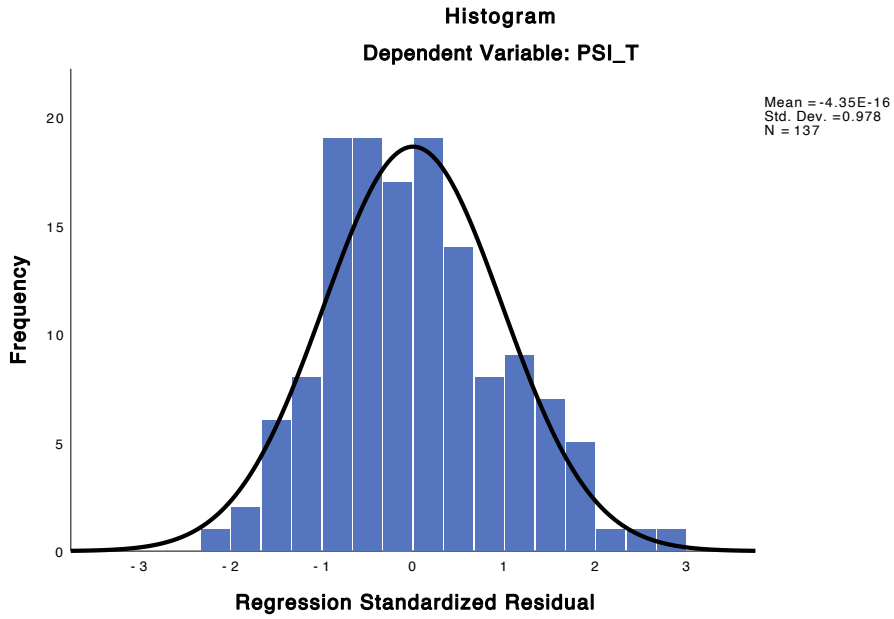


Figure G-9.2

Research Question 9 – Normal Probability Plot

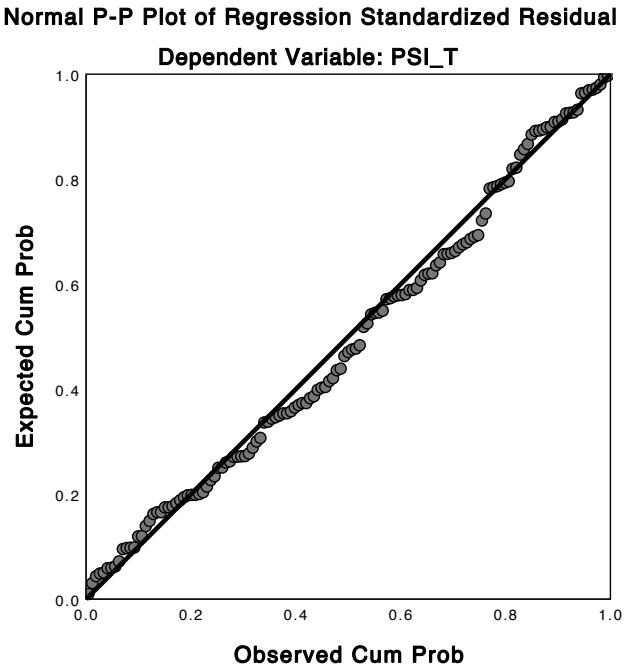
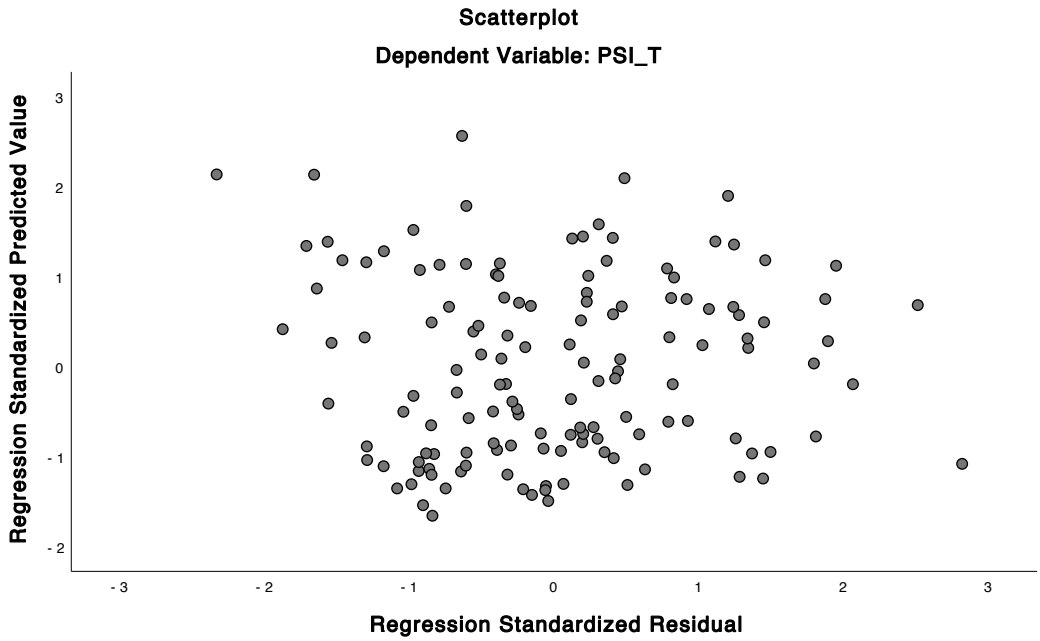


Figure G-9.3

Research Question 9 – Standardized Residual Plot



Research Question 10:

Figure G-10.1

Research Question 10 – Normality Histogram

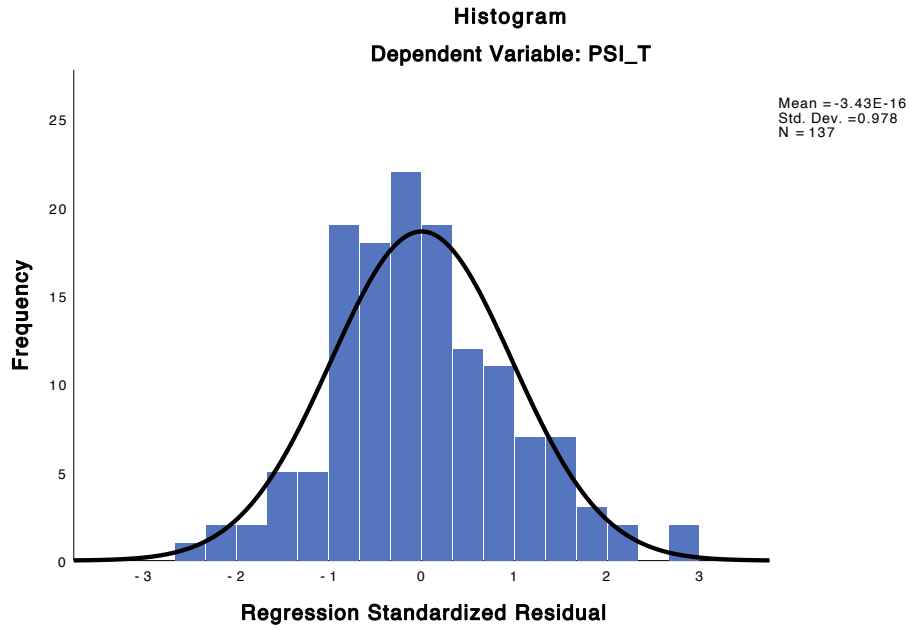


Figure G-10.2

Research Question 10 – Normal Probability Plot

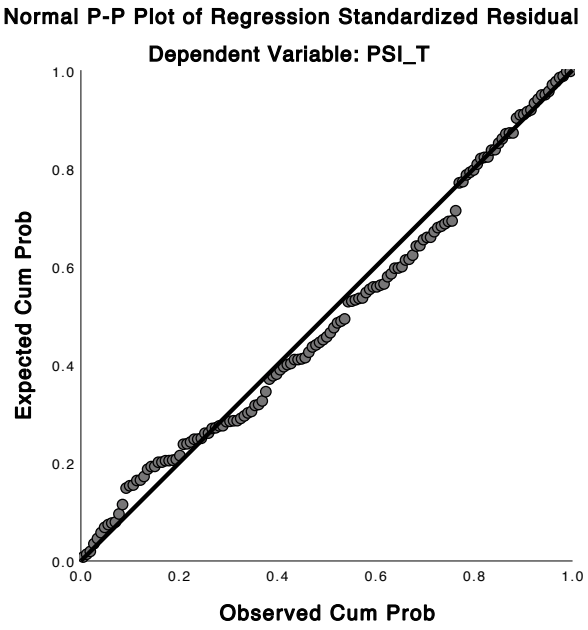
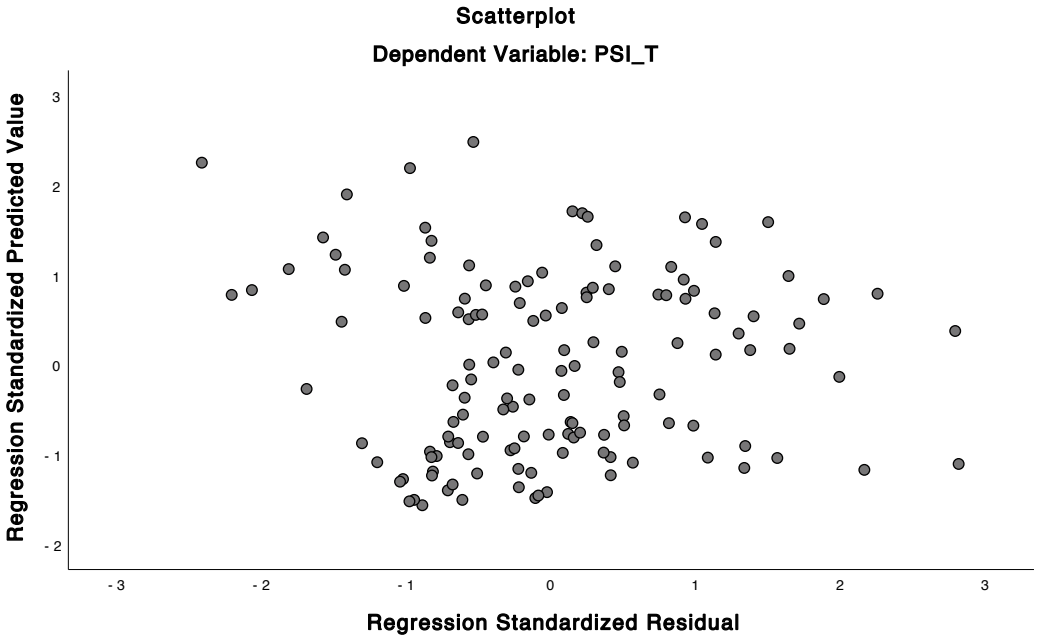


Figure G-10.3

Research Question 10 – Standardized Residual Plot



Research Question 11:

Figure G-11.1

Research Question 11 – Normality Histogram

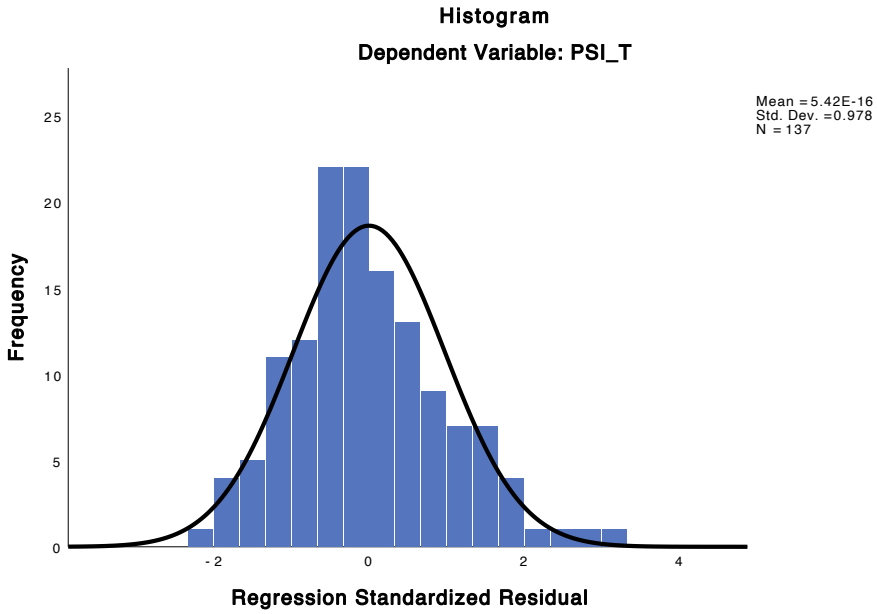


Figure G-11.2

Research Question 11 – Normal Probability Plot

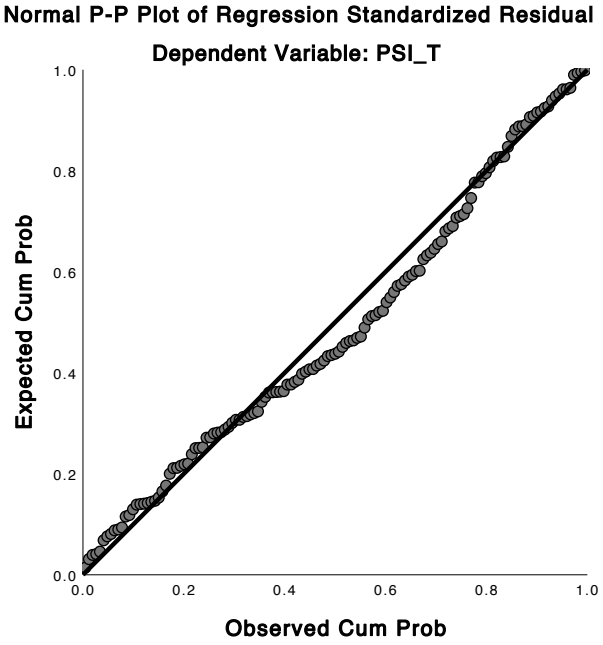
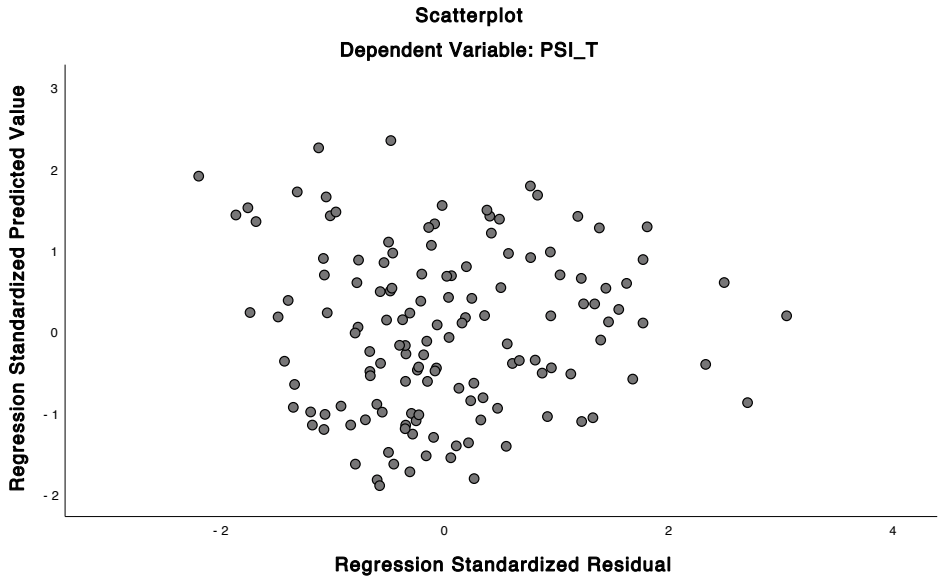


Figure G-11.3

Research Question 11 – Standardized Residual Plot



Research Question 12:

Figure G-12.1

Research Question 12 – Normality Histogram

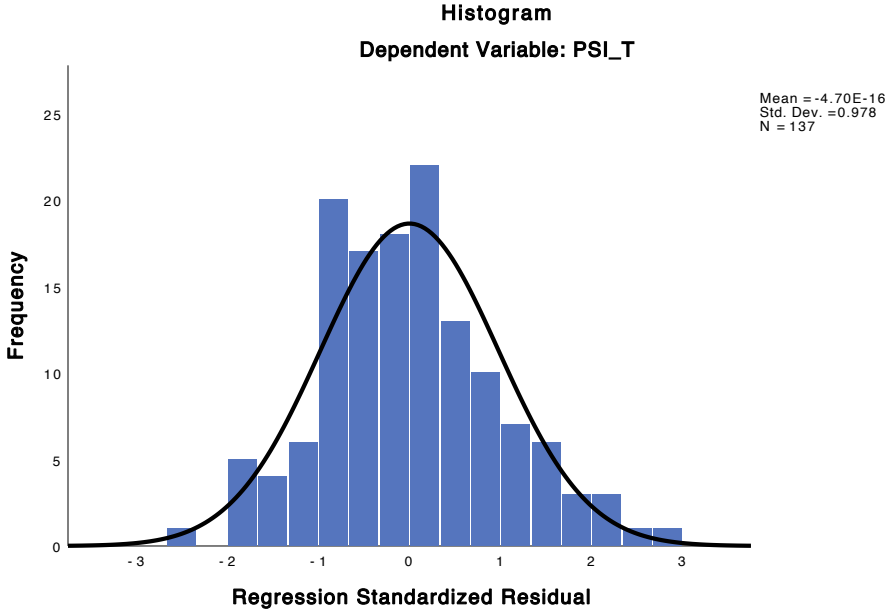


Figure G-12.2

Research Question 12 – Normal Probability Plot

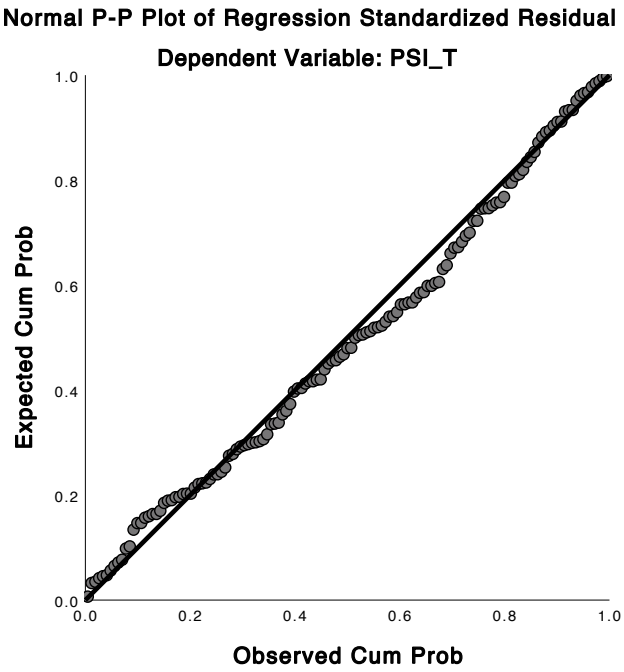
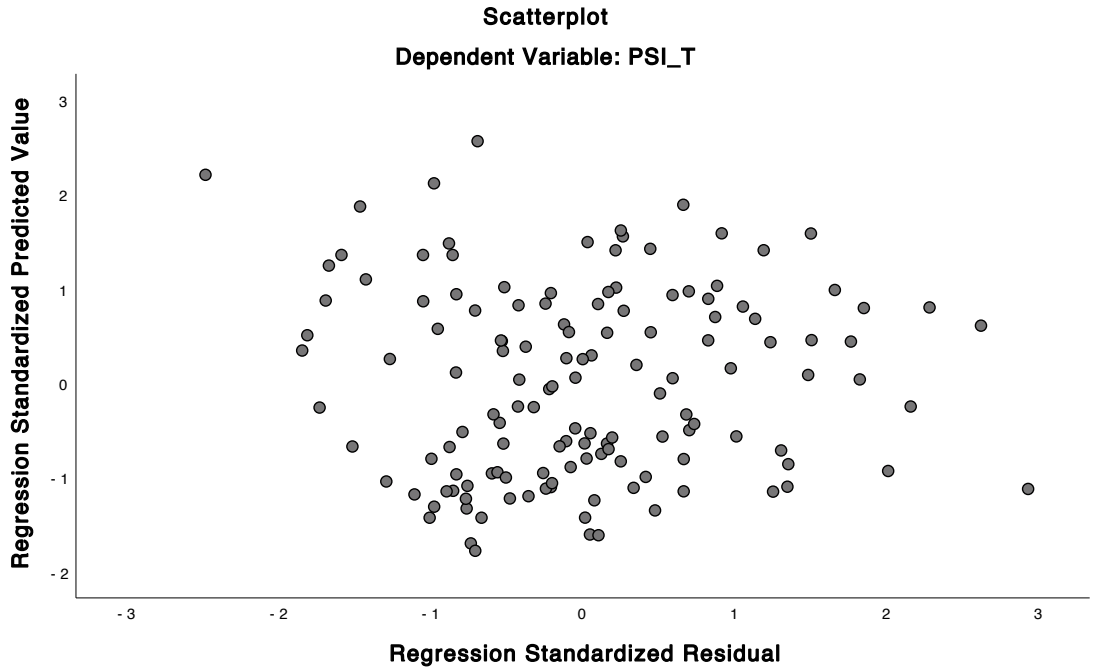


Figure G-12.3

Research Question 12 – Standardized Residual Plot



Appendix H

Variance Inflation Factor

Research Question 1

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	How old is nickname in months?	.955	1.047
	ADHDRS4HV_TOTAL	.559	1.790
	BARRS4_TOTAL	.817	1.224
	ASDvTD	.064	15.562
	BAPQ_RIGID_MEAN	.458	2.184
	BAPRxASD	.060	16.760

a. Dependent Variable: APQ_TOTAL_POS

Research Question 2:

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	How old is nickname in months?	.969	1.032
	ADHDRS4HV_TOTAL	.555	1.801
	BARRS4_TOTAL	.802	1.246
	ASDvTD	.073	13.671
	BAPQ_ALOOF_MEAN	.454	2.205
	BAPAxASD	.069	14.484

a. Dependent Variable: APQ_TOTAL_POS

Research Question 3:

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	How old is nickname in months?	.962	1.039
	ADHDRS4HV_TOTAL	.563	1.778
	BARRS4_TOTAL	.598	1.671
	ASDvTD	.064	15.616
	BAPQ_PRAGMATIC_MEAN	.402	2.488
	BAPPxASD	.059	16.977

a. Dependent Variable: APQ_TOTAL_POS

Research Question 4:

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	How old is nickname in months?	.967	1.034
	ADHDRS4HV_TOTAL	.559	1.790
	BARRS4_TOTAL	.730	1.371
	ASDvTD	.046	21.662
	BAPQ_BAP_MEAN	.360	2.781
	BAPTxASD	.042	23.752

a. Dependent Variable: APQ_TOTAL_POS

Research Question 5:

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	How old is nickname in months?	.944	1.059
	ADHDRS4HV_TOTAL	.555	1.802
	BARRS4_TOTAL	.820	1.219
	ASDvTD	.063	15.888
	BAPQ_RIGID_MEAN	.503	1.988
	BAPRxASD	.059	17.032

a. Dependent Variable: APQ_TOTAL_NEG

Research Question 6:

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	How old is nickname in months?	.960	1.041
	ADHDRS4HV_TOTAL	.554	1.806
	BARRS4_TOTAL	.807	1.240
	ASDvTD	.071	14.113
	BAPQ_ALOOF_MEAN	.506	1.974
	BAPAxASD	.069	14.538

a. Dependent Variable: APQ_TOTAL_NEG

Research Question 7:

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	How old is nickname in months?	.960	1.042
	ADHDRS4HV_TOTAL	.559	1.788
	BARRS4_TOTAL	.604	1.654
	ASDvTD	.064	15.693
	BAPQ_PRAGMATIC_MEAN	.430	2.327
	BAPPxASD	.060	16.691

a. Dependent Variable: APQ_TOTAL_NEG

Research Question 8:

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	How old is nickname in months?	.958	1.043
	ADHDRS4HV_TOTAL	.556	1.798
	BARRS4_TOTAL	.746	1.341
	ASDvTD	.045	22.325
	BAPQ_BAP_MEAN	.405	2.468
	BAPTxASD	.042	23.922

a. Dependent Variable: APQ_TOTAL_NEG

Research Question 9:

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	How old is nickname in months?	.945	1.058
	ADHDRS4HV_TOTAL	.569	1.756
	BARRS4_TOTAL	.825	1.212
	ASDvTD	.066	15.108
	BAPQ_RIGID_MEAN	.476	2.103
	BAPRxASD	.062	16.063

a. Dependent Variable: PSI_T

Research Question 10:

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	How old is nickname in months?	.958	1.044
	ADHDRS4HV_TOTAL	.563	1.775
	BARRS4_TOTAL	.814	1.228
	ASDvTD	.072	13.846
	BAPQ_ALOOF_MEAN	.449	2.228
	BAPAxASD	.068	14.791

a. Dependent Variable: PSI_T

Research Question 11:

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	How old is nickname in months?	.953	1.049
	ADHDRS4HV_TOTAL	.573	1.745
	BARRS4_TOTAL	.599	1.668
	ASDvTD	.064	15.557
	BAPQ_PRAGMATIC_MEAN	.399	2.504
	BAPPxASD	.059	17.002

a. Dependent Variable: PSI_T

Research Question 12:

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	How old is nickname in months?	.956	1.046
	ADHDRS4HV_TOTAL	.568	1.759
	BARRS4_TOTAL	.744	1.344
	ASDvTD	.047	21.428
	BAPQ_BAP_MEAN	.365	2.743
	BAPTxASD	.043	23.481

a. Dependent Variable: PSI_T

Appendix I

ASD/BAP Moderation Analyses Without Covariates

Research Question 1 (Covariates Removed):

Maternal Rigidity as a Predictor of Positive and Involved Parenting

```
**************************************************************************
Model  : 1
    Y  : APQ_TPOS
    X  : BAPR_AVG
    W  : ASDvTD

Sample
Size:  141

**************************************************************************
OUTCOME VARIABLE:
 APQ_TPOS

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .1368      .0187    43.7697      .8712     3.0000   137.0000      .4578

Model
             coeff         se          t          p       LLCI       ULCI
constant   71.0801     2.8789    24.6896      .0000    65.3872    76.7730
BAPR_AVG   -1.2013      .9843    -1.2205      .2244    -3.1477      .7450
ASDvTD      -.5760     4.2925     -.1342      .8935    -9.0641     7.9121
Int_1        .1972     1.3891      .1420      .8873    -2.5497     2.9441

Product terms key:
 Int_1    :        BAPR_AVG x        ASDvTD

Covariance matrix of regression parameter estimates:
           constant   BAPR_AVG     ASDvTD      Int_1
constant    8.2884    -2.7432    -8.2884     2.7432
BAPR_AVG   -2.7432     .9688     2.7432     -.9688
ASDvTD     -8.2884     2.7432    18.4255    -5.7435
Int_1       2.7432     -.9688    -5.7435     1.9296

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0001      .0201     1.0000   137.0000      .8873
----------
    Focal predict: BAPR_AVG (X)
          Mod var: ASDvTD   (W)
```

Research Question 2 (Covariates Removed):

Maternal Aloofness as a Predictor of Positive and Involved Parenting

```
**************************************************************************
Model  : 1
    Y  : APQ_TPOS
    X  : BAPA_AVG
    W  : ASDvTD

Sample
Size:  141

**************************************************************************
OUTCOME VARIABLE:
 APQ_TPOS

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .2021      .0408    42.7831     1.9445     3.0000   137.0000      .1253

Model
              coeff         se          t          p       LLCI       ULCI
constant    72.9039     2.7289    26.7156      .0000    67.5077    78.3001
BAPA_AVG    -1.8784      .9469    -1.9839      .0493    -3.7508     -.0061
ASDvTD      -1.9350     3.9134     -.4945      .6218    -9.6735     5.8035
Int_1         .6754     1.3005      .5193      .6044    -1.8962     3.2469

Product terms key:
 Int_1    :        BAPA_AVG x        ASDvTD

Covariance matrix of regression parameter estimates:
           constant   BAPA_AVG     ASDvTD      Int_1
constant     7.4468    -2.4939    -7.4468     2.4939
BAPA_AVG    -2.4939      .8965     2.4939     -.8965
ASDvTD      -7.4468     2.4939    15.3147    -4.8722
Int_1        2.4939     -.8965    -4.8722     1.6912

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0019      .2697     1.0000   137.0000      .6044
----------
    Focal predict: BAPA_AVG (X)
          Mod var: ASDvTD   (W)
```

Research Question 3 (Covariates Removed):

Maternal Pragmatic Language Difficulties as a Predictor of Positive and Involved Parenting

```
**************************************************************************
Model  : 1
    Y  : APQ_TPOS
    X  : BAPP_AVG
    W  : ASDvTD

Sample
Size:  141

**************************************************************************
OUTCOME VARIABLE:
 APQ_TPOS

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .3110      .0967    40.2902     4.8904     3.0000   137.0000      .0029

Model
              coeff         se          t          p       LLCI       ULCI
constant    75.0681     2.7576    27.2224      .0000    69.6151    80.5210
BAPP_AVG    -3.1387     1.1338    -2.7684      .0064    -5.3807     -.8968
ASDvTD        .3477     4.2026      .0827      .9342    -7.9626     8.6580
Int_1        -.0048     1.6469     -.0029      .9977    -3.2614     3.2518

Product terms key:
 Int_1    :        BAPP_AVG x        ASDvTD

Covariance matrix of regression parameter estimates:
           constant   BAPP_AVG     ASDvTD      Int_1
constant     7.6043    -3.0262    -7.6043     3.0262
BAPP_AVG    -3.0262     1.2854     3.0262    -1.2854
ASDvTD      -7.6043     3.0262    17.6617    -6.6789
Int_1        3.0262    -1.2854    -6.6789     2.7123

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0000      .0000     1.0000   137.0000      .9977
----------
    Focal predict: BAPP_AVG (X)
          Mod var: ASDvTD   (W)
```

Research Question 4 (Covariates Removed):

Maternal BAP Characteristics (Overall) as a Predictor of Positive and Involved Parenting

```
**************************************************************************
Model  : 1
    Y  : APQ_TPOS
    X  : BAPT_AVG
    W  : ASDvTD

Sample
Size:  141

**************************************************************************
OUTCOME VARIABLE:
 APQ_TPOS

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .2625      .0689    41.5320     3.3787     3.0000   137.0000      .0202

Model
              coeff         se          t          p       LLCI       ULCI
constant    76.9237     3.6211    21.2432      .0000    69.7632    84.0842
BAPT_AVG    -3.4812     1.3376    -2.6027      .0103    -6.1261     -.8363
ASDvTD      -3.6175     4.9577     -.7297      .4668   -13.4210     6.1860
Int_1        1.4279     1.7530      .8145      .4168    -2.0387     4.8944

Product terms key:
 Int_1    :        BAPT_AVG x        ASDvTD

Covariance matrix of regression parameter estimates:
           constant   BAPT_AVG     ASDvTD      Int_1
constant    13.1123    -4.7512   -13.1123     4.7512
BAPT_AVG    -4.7512     1.7891     4.7512    -1.7891
ASDvTD     -13.1123     4.7512    24.5789    -8.4645
Int_1        4.7512    -1.7891    -8.4645     3.0732

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0045      .6634     1.0000   137.0000      .4168
----------
    Focal predict: BAPT_AVG (X)
          Mod var: ASDvTD   (W)
```

Research Question 5 (Covariates Removed):

Maternal Rigidity as a Predictor of Negative Parenting Practices

```
**************************************************************************
Model  : 1
    Y  : APQ_TNEG
    X  : BAPR_AVG
    W  : ASDvTD

Sample
Size:  135

**************************************************************************
OUTCOME VARIABLE:
 APQ_TNEG

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .2304      .0531    36.8477     2.4488     3.0000   131.0000      .0665

Model
             coeff         se          t          p       LLCI       ULCI
constant   21.8708     2.6566     8.2327      .0000    16.6154    27.1261
BAPR_AVG    1.6526      .9105     1.8151      .0718     -.1486     3.4538
ASDvTD     -1.5986     4.1467     -.3855      .7005    -9.8017     6.6045
Int_1        .3489     1.3488      .2587      .7963    -2.3193     3.0171

Product terms key:
 Int_1    :        BAPR_AVG x        ASDvTD

Covariance matrix of regression parameter estimates:
           constant   BAPR_AVG     ASDvTD      Int_1
constant    7.0574    -2.3405    -7.0574     2.3405
BAPR_AVG   -2.3405      .8290     2.3405     -.8290
ASDvTD     -7.0574     2.3405    17.1948    -5.3983
Int_1       2.3405     -.8290    -5.3983     1.8192

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0005      .0669     1.0000   131.0000      .7963
----------
    Focal predict: BAPR_AVG (X)
          Mod var: ASDvTD   (W)
```

Research Question 6 (Covariates Removed):

Maternal Aloofness as a Predictor of Negative Parenting Practices

```
**************************************************************************
Model  : 1
    Y  : APQ_TNEG
    X  : BAPA_AVG
    W  : ASDvTD

Sample
Size:  135

**************************************************************************
OUTCOME VARIABLE:
 APQ_TNEG

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .2511      .0630    36.4606     2.9384     3.0000   131.0000      .0357

Model
             coeff         se          t          p       LLCI       ULCI
constant   23.6433     2.5419     9.3014      .0000    18.6148    28.6718
BAPA_AVG    1.0428      .8841     1.1795      .2403     -.7062     2.7918
ASDvTD     -4.5412     3.7991    -1.1953      .2341   -12.0568     2.9744
Int_1       1.4679     1.2773     1.1492      .2525    -1.0589     3.9947

Product terms key:
 Int_1    :        BAPA_AVG x        ASDvTD

Covariance matrix of regression parameter estimates:
           constant   BAPA_AVG     ASDvTD      Int_1
constant    6.4613    -2.1686    -6.4613     2.1686
BAPA_AVG   -2.1686      .7817     2.1686     -.7817
ASDvTD     -6.4613     2.1686    14.4334    -4.6567
Int_1       2.1686     -.7817    -4.6567     1.6315

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0094     1.3208     1.0000   131.0000      .2525
----------
    Focal predict: BAPA_AVG (X)
          Mod var: ASDvTD   (W)
```

Research Question 7 (Covariates Removed):

Maternal Pragmatic Language Difficulties as a Predictor of Negative Parenting Practices

```
**************************************************************************
Model  : 1
    Y  : APQ_TNEG
    X  : BAPP_AVG
    W  : ASDvTD

Sample
Size:  135

**************************************************************************
OUTCOME VARIABLE:
 APQ_TNEG

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .3504      .1228    34.1351     6.1134     3.0000   131.0000      .0006

Model
             coeff         se          t          p       LLCI       ULCI
constant   21.2105     2.5574     8.2938      .0000    16.1514    26.2696
BAPP_AVG    2.2765     1.0577     2.1522      .0332      .1841     4.3690
ASDvTD     -5.6681     3.9840    -1.4227      .1572   -13.5494     2.2132
Int_1       2.0794     1.5823     1.3142      .1911    -1.0508     5.2096

Product terms key:
 Int_1    :        BAPP_AVG x        ASDvTD

Covariance matrix of regression parameter estimates:
           constant   BAPP_AVG     ASDvTD      Int_1
constant    6.5402    -2.6176    -6.5402     2.6176
BAPP_AVG   -2.6176     1.1188     2.6176    -1.1188
ASDvTD     -6.5402     2.6176    15.8722    -6.0862
Int_1       2.6176    -1.1188    -6.0862     2.5037

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0116     1.7270     1.0000   131.0000      .1911
----------
    Focal predict: BAPP_AVG (X)
          Mod var: ASDvTD   (W)
```

Research Question 8 (Covariates Removed):

Maternal BAP Characteristics (Overall) as a Predictor of Negative Parenting Practices

```
**************************************************************************
Model  : 1
    Y  : APQ_TNEG
    X  : BAPT_AVG
    W  : ASDvTD

Sample
Size:  135

**************************************************************************
OUTCOME VARIABLE:
 APQ_TNEG

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .3256      .1060    34.7879     5.1793     3.0000   131.0000      .0021

Model
             coeff         se          t          p       LLCI       ULCI
constant   19.0045     3.3576     5.6602      .0000    12.3624    25.6466
BAPT_AVG    2.8470     1.2450     2.2868      .0238      .3841     5.3099
ASDvTD     -3.0919     4.7659     -.6488      .5176   -12.5199     6.3361
Int_1        .8643     1.6991      .5087      .6118    -2.4970     4.2255

Product terms key:
 Int_1    :        BAPT_AVG x        ASDvTD

Covariance matrix of regression parameter estimates:
           constant   BAPT_AVG     ASDvTD      Int_1
constant    11.2733    -4.1008   -11.2733     4.1008
BAPT_AVG    -4.1008     1.5500     4.1008    -1.5500
ASDvTD     -11.2733     4.1008    22.7134    -7.8978
Int_1        4.1008    -1.5500    -7.8978     2.8870

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0018      .2587     1.0000   131.0000      .6118
----------
    Focal predict: BAPT_AVG (X)
          Mod var: ASDvTD   (W)
```

Research Question 9 (Covariates Removed):

Maternal Rigidity as a Predictor of Parenting Stress

```
**************************************************************************
Model  : 1
    Y  : PSI_T
    X  : BAPR_AVG
    W  : ASDvTD

Sample
Size:  137

**************************************************************************
OUTCOME VARIABLE:
 PSI_T

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .5682      .3229   567.5741    21.1409     3.0000   133.0000      .0000

Model
              coeff         se          t          p       LLCI       ULCI
constant    53.9187    10.3033     5.2331      .0000    33.5391    74.2983
BAPR_AVG     7.6207     3.4648     2.1995      .0296      .7674    14.4740
ASDvTD      23.1419    15.4833     1.4946      .1374    -7.4836    53.7673
Int_1        1.5430     4.9582      .3112      .7561    -8.2642    11.3503

Product terms key:
 Int_1    :        BAPR_AVG x        ASDvTD

Covariance matrix of regression parameter estimates:
           constant   BAPR_AVG     ASDvTD      Int_1
constant   106.1587   -34.5158  -106.1587    34.5158
BAPR_AVG   -34.5158    12.0050    34.5158   -12.0050
ASDvTD    -106.1587    34.5158   239.7335   -73.8914
Int_1       34.5158   -12.0050   -73.8914    24.5841

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0005      .0969     1.0000   133.0000      .7561
----------
    Focal predict: BAPR_AVG (X)
          Mod var: ASDvTD   (W)
```

Research Question 10 (Covariates Removed):

Maternal Aloofness as a Predictor of Parenting Stress

```
**************************************************************************
Model  : 1
    Y  : PSI_T
    X  : BAPA_AVG
    W  : ASDvTD

Sample
Size:  137

**************************************************************************
OUTCOME VARIABLE:
 PSI_T

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .5540      .3069   580.9437    19.6341     3.0000   133.0000      .0000

Model
             coeff         se          t          p       LLCI       ULCI
constant   56.4092   10.2067     5.5267      .0000   36.2207   76.5977
BAPA_AVG    6.9997    3.5516     1.9709      .0508    -.0252   14.0245
ASDvTD     28.4888   14.6880     1.9396      .0545    -.5635   57.5411
Int_1       -.0924    4.8683     -.0190      .9849   -9.7218    9.5370

Product terms key:
 Int_1    :        BAPA_AVG x        ASDvTD

Covariance matrix of regression parameter estimates:
           constant   BAPA_AVG     ASDvTD      Int_1
constant   104.1768   -34.9953  -104.1768    34.9953
BAPA_AVG   -34.9953    12.6135    34.9953   -12.6135
ASDvTD    -104.1768    34.9953   215.7369   -68.4584
Int_1       34.9953   -12.6135   -68.4584    23.7007

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0000      .0004     1.0000   133.0000      .9849
----------
    Focal predict: BAPA_AVG (X)
          Mod var: ASDvTD   (W)
```

Research Question 11 (Covariates Removed):

Maternal Pragmatic Language Difficulties as a Predictor of Parenting Stress

```
**************************************************************************
Model  : 1
    Y  : PSI_T
    X  : BAPP_AVG
    W  : ASDvTD

Sample
Size:  137

**************************************************************************
OUTCOME VARIABLE:
 PSI_T

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .6010      .3612   535.5016    25.0623     3.0000   133.0000      .0000

Model
              coeff         se          t          p       LLCI       ULCI
constant    41.3438    10.0942     4.0958      .0001    21.3779    61.3096
BAPP_AVG    14.6382     4.1451     3.5314      .0006     6.4393    22.8371
ASDvTD      32.8289    15.5283     2.1141      .0364     2.1145    63.5433
Int_1       -2.4021     6.0525     -.3969      .6921   -14.3737     9.5694

Product terms key:
 Int_1    :        BAPP_AVG x        ASDvTD

Covariance matrix of regression parameter estimates:
           constant   BAPP_AVG     ASDvTD      Int_1
constant   101.8919   -40.4785  -101.8919    40.4785
BAPP_AVG   -40.4785    17.1821    40.4785   -17.1821
ASDvTD    -101.8919    40.4785   241.1280   -90.6663
Int_1       40.4785   -17.1821   -90.6663    36.6324

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0008      .1575     1.0000   133.0000      .6921
----------
    Focal predict: BAPP_AVG (X)
          Mod var: ASDvTD   (W)
```

Research Question 12 (Covariates Removed):

Maternal BAP Characteristics (Overall) as a Predictor of Parenting Stress

```
**************************************************************************
Model  : 1
    Y  : PSI_T
    X  : BAPT_AVG
    W  : ASDvTD

Sample
Size:  137

**************************************************************************
OUTCOME VARIABLE:
 PSI_T

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .5988      .3585   537.6947    24.7793     3.0000   133.0000      .0000

Model
             coeff         se          t          p       LLCI       ULCI
constant   32.3313   13.0755     2.4727      .0147     6.4685    58.1942
BAPT_AVG   16.3017    4.8054     3.3924      .0009     6.7968    25.8066
ASDvTD     39.5196   17.9920     2.1965      .0298     3.9321    75.1070
Int_1      -4.6521    6.3230     -.7357      .4632   -17.1588     7.8545

Product terms key:
 Int_1    :        BAPT_AVG x        ASDvTD

Covariance matrix of regression parameter estimates:
           constant   BAPT_AVG     ASDvTD      Int_1
constant   170.9687   -61.6164  -170.9687    61.6164
BAPT_AVG   -61.6164    23.0920    61.6164   -23.0920
ASDvTD    -170.9687    61.6164   323.7113  -110.7539
Int_1       61.6164   -23.0920  -110.7539    39.9805

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0026      .5413     1.0000   133.0000      .4632
----------
    Focal predict: BAPT_AVG (X)
          Mod var: ASDvTD   (W)
```