University of Tasmania, School of Psychological Sciences

Testing a Model Predicting Distress in Caregivers of Children with ASD and/or ADHD

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Statement of Sources

I declare that this report is my own original work and that contributions of others have been duly acknowledged.

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Abstract

Caregivers of children with autism spectrum disorder (ASD) or attention-deficit/hyperactivity disorder (ADHD) experience heightened levels of distress. Further, research on Model A has demonstrated that caregiver-centric variables are significant predictors of distress in caregivers of children with ASD (Bones et al., 2019; Falk et al., 2014), ADHD, and typically developing children (Scott, 2018). The current study aimed to replicate this research, and further, to validate Model A in caregivers of children with comorbid ASD and ADHD. Participants were 205 caregivers of 5- to 17-year-old children with ASD ($n = 41$), ADHD ($n = 44$), comorbid ASD and ADHD ($n = 53$), or who were typically developing ($n = 67$). Participants completed an online questionnaire with measures of caregiver distress, socio-economic support, maladaptive caregiver cognitions, child externalised behaviour, and child social and interpersonal deficits. Using hierarchical regression analyses, Model A was validated by significantly predicting distress in caregivers of children with ADHD, and comorbid ASD and ADHD. Results indicated that child social and interpersonal deficits, social support, and parental locus of control predicted caregiver distress to the greatest extent in each group. It is argued that caregiver distress be considered a key target for improving outcomes for families impacted by ASD and/or ADHD.

Key Terms: Caregiver distress, child behaviour, social support, parental locus of control, comorbid autism spectrum disorder and attention-deficit/hyperactivity disorder

Raising a child with autism spectrum disorder (ASD) or attention-deficit/hyperactivity disorder (ADHD) can be rewarding, but caregivers often face unique challenges, as the behaviours and characteristics of children with ASD or ADHD differ substantially from those of typically developing children (Falk et al., 2014; van Steijn et al., 2014). These include problem behaviours, impaired social communication, and difficult transitional periods during childhood and adolescence (Sim et al., 2018). Caregivers of children diagnosed with ADHD or ASD typically experience higher levels of depression, anxiety, and stress than caregivers of typically developing children (McRae et al., 2020; Reed et al., 2017; Shepherd et al., 2018).

Elevated levels of caregiver distress can have negative consequences for the child, impacting the implementation of educational interventions, the child's social and communication skills, and levels of aggressive and challenging behaviour (Reed et al., 2017). Current treatment approaches for both ADHD and ASD largely focus on interventions for the child, disregarding the caregiver's experience of distress (Harrison & Sofronoff, 2002). Furthermore, the empirical evidence exploring predictors of caregiver distress tends to focus solely on child-centric factors such as child symptom severity and problem behaviours (McRae et al., 2020). To date, relatively little attention has been paid to caregiver-focused interventions, and the role of multiple factors in the prediction of caregiver distress (Bones et al., 2019). One exception is "Model A" developed by Falk et al. (2014). Model A has been applied to examine factors predictive of caregiver distress across several populations, and has consistently demonstrated the role of both child and caregiver centric experiences in the development of caregiver distress. The aim of the present study was to replicate previous Model A research, and examine Model A in a new sample population of children with a comorbid diagnosis of ASD and ADHD.

Autism Spectrum Disorder and Attention-Deficit/Hyperactivity Disorder

ASD is a neurodevelopmental disorder characterised by persistent impairments and deficits in social interaction and communication, and restricted, repetitive patterns of thought and behaviour (American Psychiatric Association [APA], 2013). These characteristics can manifest in a variety of ways and with a wide range of symptom severity, although social communication deficits are core diagnostic features of ASD (van Steijn et al., 2014). Social communication deficits can include difficulties in developing and maintaining relationships, deficits in non-verbal communication within social interactions, and impaired social and emotional reciprocity (APA, 2013). In addition to ASD-specific symptoms and characteristics, other potentially problematic behaviours include aggressive and oppositional behaviour, and possible comorbid psychiatric disorders (Sikora et al., 2012). ADHD is the most frequently diagnosed comorbidity with ASD (Carta et al., 2020).

ADHD is a childhood-onset neurodevelopmental disorder characterised by a pervasive pattern of inattention and/or impulsivity and hyperactivity that affects functioning and development (APA, 2013). Children with ADHD may have difficulty staying focused and adapting to changing situations, and can be defiant, aggressive, fidgety, or loud (APA, 2013). In addition to the core symptoms of ADHD, other potentially problematic behaviours include conduct problems and a range of externalising behaviours (as discussed in further detail below) that contribute to poorer functional outcomes (McRae et al., 2020).

ADHD and ASD are the two most commonly occurring child neurodevelopmental disorders, affecting 1-2% and 7% of children worldwide, respectively (Harkins et al., 2021; Thomas et al., 2015). Both disorders frequently co-occur (Carta et al., 2020), and share symptoms such as hyperactivity/impulsivity, inattention, impairments in motor and executive functioning, and social and communicative impairments (Harkins et al., 2021; Kern et al., 2015). Estimates suggest that approximately 66% of individuals with ADHD display clinical

features of ASD, and that up to 50% of individuals with ASD display symptoms consistent with a diagnosis of ADHD (Davis & Kollins, 2012). Children with ASD and/or ADHD often face lengthy diagnostic processes, a lack of understanding in society, and daily problem behaviours (Bones et al., 2019). These challenges may detrimentally affect caregiver mental health, which in turn may hinder the parent-child relationship and result in emotional difficulties and poorer child outcomes (Falk et al., 2014; McRae et al., 2020). Child behavioural techniques are currently the primary focus of ASD and ADHD interventions, including cognitive-behavioural therapy and social skills training (Theule et al., 2018). Caregivers are integral to the implementation of child interventions, although any focus on caregivers tends to solely involve their administration of child-focused behavioural techniques (Bones et al., 2019). However, growing evidence is increasingly demonstrating that holistic, family-oriented interventions show more robust outcomes for the family unit than purely child-centric interventions (Osbourne et al., 2008).

Distress in Caregivers of Children with ASD and ADHD

Depression is a negative mood state that affects both the mind and body, characterised by feelings of hopelessness, and a loss of incentive, interest in pleasurable activities, and self-esteem (Lovibond & Lovibond, 1995). Anxiety, another negative mood state, is characterised by tension, worry, and physiological arousal in response to an anticipated threat (Kovacs & Borcsa, 2017). Stress is conceived as a state of persistent physiological arousal that occurs in response to life demands exceeding one's perceived ability to cope (Lovibond & Lovibond, 1995). Experiences of depression, anxiety, and stress related to the demands of the caregiver role are encompassed by the umbrella term 'distress' in this study, congruent with previous research (Bones et al., 2019; Falk et al., 2014; Scott, 2018). While it is not unusual for all caregivers to experience distress at times (Hayes & Watson, 2013), there is considerable evidence to suggest that caregivers of children with ADHD and/or ASD experience more

persistent and higher levels of distress than other parenting groups (McRae et al., 2020; Reed et al., 2017; Shepherd et al., 2018).

Several theories attempt to explain these heightened levels of distress in caregivers of children with neurodevelopmental disorders. One such theory is the Double ABCX model, which incorporates Lazarus and Folkman's (1984) cognitive model of stress and coping. The model contends that caregiver distress is influenced by multiple factors, including cognitive coping strategies, family resources, family adaptation, child behaviour severity, and social support (Manning et al., 2011). However, the outcome variables in this model explored by researchers apply to the broader family context, not caregiver distress alone (Bones et al., 2019).

Elevated levels of caregiver distress have been associated with poorer outcomes for families, and with increased use of maladaptive parenting practices (Derguy et al., 2015; McRae et al., 2020). Caregiver stress, in particular, has been found to be associated with an authoritarian parenting style, including higher levels of harsh parenting behaviours and fewer warm, supportive parenting behaviours (van Steijn et al., 2014). These parenting behaviours have been found to be associated with increased child problem behaviours (McRae et al., 2020; Osbourne et al., 2008), which further increases caregiver distress, creating a mutually escalating effect. Beyond impacting child behaviour and family functioning, caregiver distress has also been shown to inhibit child outcomes (Osbourne et al., 2008). Distress can create barriers to seeking help, such as reduced therapy attendance and a decreased likelihood of following intervention techniques for the child (McRae et al., 2020). This suggests that reducing caregiver distress may facilitate the efficacy of child-focused ASD or ADHD interventions. Thus, as caregiver functioning and well-being is crucial in fostering both caregiver psychological health and positive child outcomes, it is imperative to identify the

factors that predict caregiver distress in order to implement effective assessment and interventions.

Predicting Caregiver Distress

Given the unique challenges faced by children diagnosed with ASD and/or ADHD and their families, it is important to identify the factors predictive of caregiver distress if this distress is to be reduced (Falk et al., 2014; McRae et al., 2020). Previous literature has largely focused on child-centric factors, namely the core symptomology of the child's diagnosis (McRae et al., 2020; Shepherd et al., 2018). Numerous studies have found these factors to be positively correlated with caregiver distress, suggesting that caregiver well-being may depend on the severity of the child's behaviour (Craig et al., 2016; Podolski & Nigg, 2001; Shepherd et al., 2018). However, levels of distress experienced by caregivers of children with ASD appear to be similar to those of children with ADHD, suggesting that caregiver distress in these populations may be mediated by factors other than the severity of the child's diagnosis (van Steijn et al., 2014). Research is beginning to highlight the important role of caregiver-centric factors in predicting distress, such as social and economic support, and maladaptive caregiver cognitions (Falk et al., 2014).

To date, most research examining both child-centric and caregiver-centric predictors of caregiver distress has largely focused on a small number of predictive variables alongside a single dependent variable (typically depression, anxiety, or stress) (Falk et al., 2014). Thus, a simultaneous examination of the interactions among predictive variables is needed to better understand their combined influence on distress in caregivers of children with ASD, ADHD or comorbid ASD and ADHD (McRae et al., 2020), and ultimately to inform and improve the efficacy of targeted interventions (Hayes & Watson, 2013). To achieve this objective, researchers have called for an empirically evaluated model that attempts to accurately reflect the interaction of predictor variables from a holistic viewpoint (Sim et al., 2018).

Model A

In response to the need for a more holistic perspective, Falk and colleagues (2014) studied the relationships between various key predictors of distress in caregivers of children with ASD. This led to the development of 'Model A', which proposes that the relationship between caregiver distress and child-centric variables is mediated by caregiver-centric variables (Falk et al., 2014). Model A contains the following five factors: caregiver distress (experiences of depression, anxiety, and stress), child social and interpersonal deficits (ASD and ADHD severity), child externalising behaviours (conduct problems and aggressive behaviour), maladaptive caregiver cognitions (caregiver locus of control and perceived limit setting ability), and socio-economic support (caregiver social and economic support). Bones et al. (2019) adapted the original terminology of Model A to facilitate its use in non-ASD populations (See Figure 1).

Additional support for the model has since been provided in new samples of caregivers of children with ASD (Bones et al., 2019), ADHD (Scott, 2018), Down Syndrome (Van Der Hek, 2018), and children born pre-term (Duggan, 2020). The decision to replicate Falk et al.'s (2014) model in the current study was motivated by the need for more theory-driven research in light of psychology's current replication crisis (Lewandowsky, 2020).

Figure 1

Model A
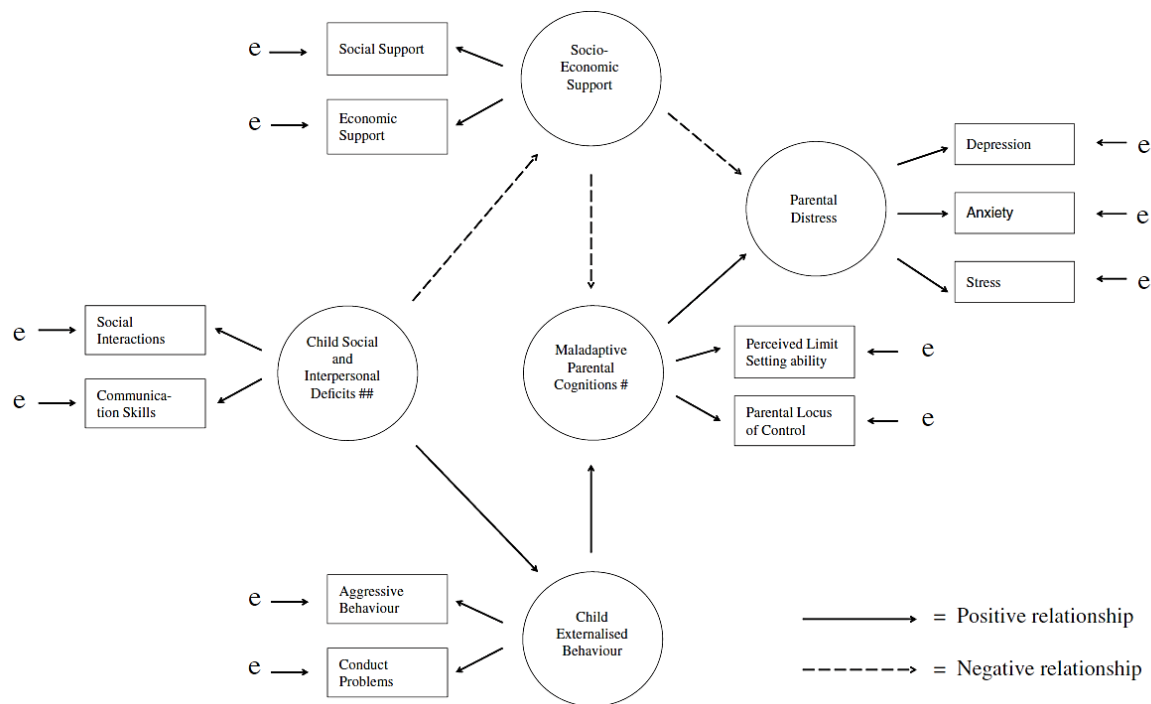
Note. e= error variance. Circles represent latent variables (factors); rectangles represent observed variables (indicators). Solid lines represent positive relationships; broken lines represent negative relationships. *Parental cognitions were altered to maladaptive parental cognitions for ease of interpretation **ASD severity was altered to child social and interpersonal deficits to facilitate use in non-ASD samples. Adapted from "The Factors Predicting Stress, Anxiety, and Depression in the Parents of Children with Autism" by N. H Falk, K. Norris, and M. G. Quinn, 2014, *Journal of Autism and Developmental Disorders, 44,* p. 3196. Copyright 2014 by N. Falk.

Previous Model A research has also called for the examination of caregivers of children with comorbid disorders to further determine the model's clinical utility (Bones et al., 2019). There is a lack of research on the effect of comorbid ASD and ADHD on caregiver distress and the family climate (Harkins et al., 2021; Kern et al., 2015; van Steijn et al., 2014). This is largely due to the fact that until the fifth iteration of the Diagnostic and Statistical Manual of Mental Disorders (APA, 2013), diagnostic guidelines prevented a comorbid diagnosis of ASD and ADHD, and thus the two diagnoses had been studied in

isolation. This presents a critical gap, given that research suggests that children with comorbid ASD and ADHD experience greater impairments in daily functioning than children ASD or ADHD alone, and display more severe behavioural symptoms associated with both disorders (Harkins et al., 2021; Thomas et al., 2015). Caregivers of children with a comorbid diagnosis may therefore experience greater levels of distress.

Thus, the current study aimed to extend and replicate the findings of Falk et al. (2014), and subsequently of Bones et al. (2019) and Scott (2018), by testing the predictive validity of the model in a concurrent sample population: caregivers of children with ASD, ADHD, comorbid ASD and ADHD, and of typically developing children. The inclusion of typically developing children enables comparison to be drawn between population group, thereby identifying if there are unique factors related to the experience of parenting a child with a neurodevelopmental disorder, or whether there are universal factors that vary in intensity.

Variables in Model A

Depression, Anxiety, and Stress

In line with previous research (Bones et al., 2019; Falk et al., 2014; Scott, 2018), depression, anxiety, and stress are collectively termed 'distress' in this study. High intercorrelations between these three factors have been observed, which may reflect a significant number of common symptoms, causes, and environmental risk factors (Lovibond & Lovibond, 1995).

Social and interpersonal deficits

Persistent social communication deficits are core to the symptomology of ASD (APA, 2013). Correspondingly, similar areas of social dysfunction have increasingly been documented amongst children and adolescents with ADHD, including poor self-control in social situations (Rosen et al., 2014). As a result, caregivers of children with ASD and/or

ADHD are often placed under increased physical and emotional demands, which can contribute to experiences of distress and affect the parent-child relationship (Hayes & Watson, 2013; McRae et al., 2020). There is substantial evidence to suggest that elevated levels of caregiver distress are influenced, in part, by child ASD or ADHD symptom severity (McRae et al., 2020; Shepherd et al., 2018; Theule et al., 2011). For example, among caregivers of children with ASD, Benson (2006) found that child ASD severity was significantly positively correlated with both caregiver depression and stress proliferation, confirming the importance of child symptom severity – including social, behavioural, and communicative deficits – in the prediction of caregiver distress.

Child externalised behaviour

Child externalising behaviours are violations of behavioural norms that encompass oppositional, defiant, and aggressive behaviour, emotional reactivity, and conduct problems (Fogleman et al., 2018; McRae et al., 2020). These behaviours are common in children with ASD and/or ADHD and can interfere with children's social functioning and family relations (Carta et al. 2020; Fogleman et al., 2018). Findings suggest that a range of difficulties such as aggressive behaviour and conduct problems are likely to co-occur within both ADHD and ASD (Russell et al., 2013). Managing child externalising behaviours can be challenging for caregivers, as defiant child behaviours require extensive management strategies and can often affect caregiver functioning (Suárez & Baker, 1997). For example, higher levels of child externalising behaviour in children with ADHD have been found to be significantly associated with elevated levels of caregiver distress, and may correlate bidirectionally, exacerbating one another over time (McRae et al. 2020; Osbourne et al., 2008).

Maladaptive caregiver cognitions

Differences in caregivers' cognitive appraisals of child problem behaviour influence their adjustment to stressful situations. In turn, there is evidence of a strong association

between these cognitive states and experiences of caregiver distress (Hassall et al., 2005). Falk et al. (2014) identify perceived locus of control and limit setting ability as two primary caregiver cognitions that predict caregiver distress.

'Locus of control' is defined as one's tendency to view events as being controlled by external or internal sources (Lloyd & Hastings, 2009). Specifically, caregiver locus of control refers to a caregiver's perception of the degree of control they have over their child's behaviour, alongside the degree of control they believe their child has over their life (Campis et al., 1986). Caregivers with an internal locus of control tend to perceive their child's development and behaviour as within parental control, and experience lower levels of parenting stress than those with an external locus of control (Freed & Tompson, 2011; Hassall et al., 2005). An external locus of control has frequently been found to be maladaptive for caregivers of children with a disability (Lloyd & Hastings, 2009). Research suggests that compared to caregivers of typically developing children, caregivers of children with behavioural difficulties are more likely to hold an external caregiver locus of control (Campis et al., 1986; Freed & Tompson, 2011), which has been found to be associated with increased caregiver distress (Bones et al., 2019; Falk et al., 2014; Lloyd & Hastings, 2009; Scott, 2018).

'Limit setting ability' refers to a caregiver's perceived capacity to establish and enforce acceptable parameters of child behaviour (Gerard, 1994). An increased limit setting ability is considered an adaptive parenting skill and is useful when dealing with challenging child behaviours (Reed et al., 2016). Consequently, limit setting ability has been demonstrated to play a mediating role between child-centric variables and caregiver distress in caregivers of children with ASD (Bones et al., 2019; Falk et al. 2014), and caregivers of children with ADHD (Scott, 2018). Although locus of control and limit setting ability measure different phenomena, both consider the caregiver's perception of control. In both

instances, a perceived a lack of control over one's child is predictive of elevated levels of distress (Falk et al., 2014).

Social and economic support

Social support refers to the provision of physical, emotional, instrumental, and informational assistance that is appraised as helpful (Weiss et al., 2013). In the context of caregivers of children with ASD and/or ADHD, social support may come in the form of childcare or household assistance from friends and family, support groups, or formal support from healthcare services and practitioners (Bluth et al., 2013; Dunn et al., 2001). Lazarus and Folkman's (1984) cognitive model of stress and coping continues to influence research into caregiver stress and coping; assigning importance to the individual's cognitive appraisal of the stressor and their personal and social resources to cope with the situation. In line with this model, Hassall et al. (2005) contend that social support is an important potential protective factor against experiences of distress, as it has been found to be associated with adaptive cognitive appraisals and coping strategies. However, families of children with ADHD have been shown to have lower levels of perceived social support from friends and family than families of children without ADHD (Theule et al., 2011). Theule et al. (2011) report that lower levels of social support tend to predict elevated levels of caregiver distress in this population, suggesting that social support is an important factor to address when aiming to reduce caregiver distress.

Raising a child with ASD and/or ADHD can represent a substantial economic and financial burden to caregivers (Sim et al., 2018). This is predominantly due to higher school and health-care costs, direct costs of interventions and treatment, and indirect costs associated with loss of income due to additional care responsibilities (Lord et al., 2018; Scott, 2018). Lack of economic support (whether familial or extra-familial) is a known contributor to caregiver distress (Falk et al., 2014).

The Current Study

The first aim of this study was to examine whether Model A successfully predicts distress in caregivers of children with ASD, ADHD, and typically developing children; a replication of previous Model A research. Model A's predictive utility has not yet been examined in ASD and ADHD populations simultaneously. In line with the findings of Falk et al. (2014), and subsequently Bones et al. (2019) and Scott (2018), it was hypothesised that Model A would be validated by accounting for a significant proportion of the variance in distress experienced by caregivers of children with ASD, ADHD, and typically developing children.

The second aim of this study was to extend the application of Model A and examine its validity in predicting distress in a new sample: caregivers of children who have a comorbid diagnosis of ASD and ADHD. Previous research by Bones et al. (2019) and Scott (2018) demonstrate that caregiver-centric variables were predictive of distress in caregivers of children with a diagnosis of ASD or ADHD. This suggests that Model A may be effective in predicting distress in caregivers of children with a comorbid diagnosis. Based on these findings, it was hypothesised that caregiver-centric variables would account for a significant proportion of the variance in distress experienced by caregivers of children with a comorbid diagnosis. This pattern of results may provide empirical support for Model A's universality. Additionally, results may guide specific treatment considerations for caregivers of children with comorbid ASD and ADHD, through the identification of the key factors that predict caregiver distress in this population.

Method

Ethics

This research was conducted as part of a larger project, approved by the University of Tasmania Social Sciences Human Research Committee (reference number H0017272), with

the student researcher added in May 2021 (see Appendix A for approval letter). Participants answered questions about their child's behaviour and development, in addition to their own mental health and experiences of caregiving. This had the potential to invoke feelings of discomfort. However, mechanisms were put in place to ensure the study complied with the National Statement on Ethical Conduct in Human Research (National Health and Medical Research Council, 2018). Firstly, the information sheet (Appendix B) outlined the purpose of the study, possible risks and benefits, and participants' right to withdraw from the study at any time. Secondly, participants were informed that data would remain non-identifiable, and that they could withdraw at any point prior to survey submission. Thirdly, participants were provided with the contact details of the researchers and of support services such as Lifeline and Beyond Blue, should they experience any discomfort.

Participants

We recruited caregivers in Australia of children aged between 5 years 0 months and 17 years 11 months, with ASD, ADHD, a comorbid diagnosis of ASD and ADHD, or who were typically developing. We aimed to recruit a minimum of 223 participants in order to detect a moderate effect size of .3 and achieve a power of .95 (Soper, 2021). Participants were recruited through advertisements distributed to a variety of ASD- and ADHD-related organisations and bodies in various Australian states and territories, Tasmanian medical and child health practices, the Australian Psychology Society, social media advertisements, and the University of Tasmania's portal for student research participation (SONA). See Appendix C for the advertisement flyer used.

In total, 218 participants competed the online survey. Responses from 13 participants were omitted because they reported for children younger than our minimum of five years of age. The final sample analysed was 205, which comprised 41 caregivers of children with ASD, 44 caregivers of children with ADHD, 53 caregivers of children with comorbid ASD

and ADHD, and 67 caregivers of typically developing children. Table 1 contains
demographic information about participating caregivers, and Table 2 contains demographic
information about the children participants reported on.

As shown in Table 1, across groups, the majority of participants were primary
caregivers for the child, and female. Caregivers reported higher household income levels and
level of education than the average Australian (Australian Bureau of Statistics, 2019a;
2019b). A large proportion of participating caregivers reported personally experiencing an
existing mental health condition.

As seen in Table 2, while approximately half of typically developing children in the
study were female, a higher proportion of children in the ASD sample, ADHD sample, and
comorbid ASD and ADHD sample were male. This reflects typical diagnosis rates by gender,
as meta-analytic findings demonstrate that ASD and ADHD disproportionately affects males,
even after taking into consideration diagnostic biases (i.e., females who meet diagnostic
criteria yet do not receive a formal diagnosis) (Loomes et al., 2017; Wright et al., 2009).

Table 1

Demographic Characteristics of Participating Caregivers

Demographic Variable	Whole Sample	ASD	ADHD	ASD and ADHD	Typically Developing
N	205	41	44	53	67
Sex n (%)					
Female	194 (94.7)	38 (92.7)	43 (97.8)	65 (97)	48 (90.6)
Male	11 (5.3)	3 (7.3)	1 (2.2)	2 (3)	5 (9.4)
Age in Years (M)	41	44	42	42	41
Primary Carer for Child n (%)					
Yes	7 (96.6)	40 (97.6)	43 (97.7)	64 (95.5)	51 (96.2)
No	189 (3.4)	1 (2.4)	1 (2.3)	3 (4.5)	2 (3.8)
Level of Education n (%)					
Less than Year 12 or Equivalent	9 (4.4)	2 (4.9)	1 (2.3)	4 (6.1)	2 (3.8)
Year 12 or equivalent	24 (11.8)	1 (2.4)	7 (15.9)	7 (10.6)	9 (17)
Vocational Training	29 (14.2)	6 (14.6)	8 (18.2)	10 (15.2)	5 (9.4)
Undergraduate diploma	23 (11.3)	8 (19.5)	3 (6.8)	4 (6.1)	7 (13.2)
Bachelor degree	55 (27)	15 (36.6)	12 (27.3)	16 (24.2)	12 (22.6)
Postgraduate Degree	64 (31.4)	9 (22)	12 (27.3)	25 (37.9)	18 (34)
Relationship Status					
Married	116 (56.6)	23 (56.1)	26 (59.1)	39 (58.2)	28 (52.8)
De Facto Relationship	34 (16.6)	5 (12.2)	6 (13.6)	14 (20.9)	9 (17.0)
Separated/Divorced	34 (16.6)	8 (19.5)	8 (18.2)	8 (11.9)	10 (18.9)
Single	19 (9.3)	3 (7.3)	4 (9.1)	6 (9.0)	6 (11.3)
Widowed	2 (1.0)	2 (4.9)	-	-	-
Total Household Income (M)	$80-120K	$80-120K	$80-120K	$80-120K	$80-120K
Mental Health Condition n (%)					
Yes	140 (68.3)	28 (68.3)	29 (65.9)	43 (64.2)	40 (75.5)
No	65 (31.7)	13 (31.7)	15 (34.1)	24 (35.8)	13 (24.5)
Medical Condition n (%)					
Yes	85 (41.5)	15 (36.6)	17 (38.6)	25 (37.3)	28 (52.8)
No	115 (56.1)	25 (61.0)	27 (61.4)	40 (59.7)	23 (43.4)
N/A	5 (2.4)	1 (2.4)	-	2 (3.0)	2 (3.8)

Table 2

Demographic Characteristics of the Children Reported on by Caregivers

Demographic Variable	Whole Sample	ASD	ADHD	ASD and ADHD	Typically Developing
Mean Age in Years (*SD*)	10.3 (3.8)	11.2 (3.5)	10.4 (3.9)	10.4 (3.7)	9.4 (3.8)
Sex *n* (%)					
Female	67 (32.7)	9 (22.0)	12 (27.3)	38 (56.7)	8 (15.1)
Male	136 (66.3)	32 (78)	31 (70.5)	29 (43.3)	44 (83)
Other	2 (1.0)	-	1 (2.3)	-	1 (1.9)
Birth Order *n* (%)					
Oldest	79 (38.5)	9 (22)	16 (36.4)	29 (43.3)	25 (47.2)
Middle	32 (15.6)	8 (19.5)	9 (20.5)	9 (13.4)	6 (11.3)
Youngest	61 (29.8)	15 (36.6)	14 (31.8)	17 (25.4)	15 (28.3)
Only	33 (16.1)	9 (22.0)	5 (11.4)	12 (17.9)	7 (13.2)
Relationship of Caregiver to Child *n* (%)					
Biological Mother	191 (93.2)	38 (92.7)	42 (95.5)	63 (94.0)	48 (90.6)
Biological Father	10 (4.9)	3 (7.3)	1 (2.3)	1 (1.5)	5 (9.4)
Stepmother	2 (1.0)	-	-	2 (3.0)	-
Stepfather	1 (0.5)	-	-	1 (1.5)	-
Foster Mother	1 (0.5)	-	1 (2.3)	-	-
Foster Father	-	-	-	-	-

Materials

Demographic Questionnaire

The demographic questionnaire collected information about caregiver and child age, gender, family structure, household members, household income, diagnosed psychological and medical conditions, and education levels (See Appendix D).

Short Form Depression, Anxiety, and Stress Scale (DASS-21; Lovibond & Lovibond, 1995)

The DASS-21 contains three seven-item subscales measuring depression, anxiety, and stress. Caregivers responded in relation to how they felt in the past seven days (e.g., "I found

it difficult to relax"), using a 4-point Likert scale. Responses range from 0 "Did not apply to me at all – Never" to 3 "Applied to me very much, or most of the time – Almost always". Possible total scores range from 0-21, with higher scores indicating higher levels of distress. Good internal consistency has been established for each subscale of the DASS-21, with Cronbach's alpha values of .81, .73, and .81 for depression, anxiety, and stress, respectively (Lovibond & Lovibond, 1995).

Social Communication Questionnaire: Current Form (SCQ; Rutter et al., 2003)

The SCQ was used to measure child social and interpersonal deficits for those caregivers who indicated their child had an ASD diagnosis. The SCQ provides an indication of the approximate level of severity of ASD symptomatology, assessing verbal and non-verbal communication skills, social and interpersonal interaction behaviours, and patterns in behaviour exhibited by a child (Rutter et al., 2013). The 'current' form assesses the daily experiences of caregivers, comprising 40 yes/no items related to observations of the child's interpersonal interactions and behaviour within the past three months (e.g., "When she/he was 4 to 5, did she/he show a normal range of facial expressions?"). Higher scores are indicative of higher levels of abnormal behaviour. Good internal consistency has been established, with Cronbach's alpha values of .84 to .93 (Rutter et al., 2003).

Disruptive Behaviour Rating Scale-2nd Edition (DBRS-II; Erford et al., 2015)

Caregivers who indicated that their child had a diagnosis of ADHD completed the DBRS-II, which provides a measure of ADHD severity in terms of child social and interpersonal deficits. Following Scott (2018), questions were adjusted for caregiver report of child behaviour rather than self-report. The DBRS-II has 35 items (e.g., "They are restless, squirmy"), measured on a four-point Likert scale, with responses ranging from "Rarely" displayed behaviour to behaviour that is displayed "Most of the time". Higher scores indicate higher levels of abnormal behaviour. The DBRS-II measures five subscales: inattention,

hyperactivity/impulsivity, antisocial conduct, oppositional behaviour, and anxiety (Erford et al., 2015). Good internal consistency has been demonstrated, with Cronbach alpha estimates for the subscales ranging from .74 to .83 (Erford et al., 2015).

The Child Behaviour Checklist, a Component of the Achenbach System of Empirically Based Assessment (ASEBA; Achenbach & Rescorla, 2000)

The Child Behaviour Checklist (CBCL) was presented to all caregivers to evaluate children's externalising behaviours. To encompass this study's age range, both the CBCL for ages 1.5-5 (CBCL/1.5-5, with 99 items, possible score range 0-198) and CBCL for ages 6-18 (CBCL/6-18, with 113 items, possible score range 0 to 226) were used (e.g., "Quickly shifts from one activity to another"). Both scales are measured on a three-point Likert scale, with responses ranging from 0 "Not true (as far as you know)" to 2 "Very true or often true". Good internal consistency of the CBCL has been demonstrated, with Cronbach's alpha values of .80 demonstrated for the CBCL/1.5-5, and .97 for the CBCL/6-18 (Achenbach & Rescorla, 2000).

Parent-Child Relationship Inventory (PCRI; Gerard, 1994)

The PCRI was used to measure caregiver cognitions. Thirty-six items across three subscales were used to measure perceived limit setting ability, satisfaction, and involvement (e.g., "I get a great deal of satisfaction from having children"). Items are scored on a four-point Likert scale with responses ranging from 1 "Strongly disagree" to 4 "Strongly agree". Higher scores indicate higher levels of each construct. Possible total scores range between 36 and 144 across the three subscales. A Cronbach's alpha value of .70 across all subscales is indicative of acceptable internal consistency (Gerard, 1994).

Short Form Parental Locus of Control (PLOC-SF; Campis et al., 1986)

The PLOC-SF was used to measure caregiver locus of control. The PLOC-SF contains four subscales; caregiver efficacy, caregiver responsibility, child control of

caregivers' life, and caregiver control of child's behaviour. Twenty-five items (e.g., "My child does not control my life") are rated on a five-point Likert scale ranging from 1 "Strongly disagree" to 5 "Strongly agree". Possible total scores range between 25 and 125, with higher scores indicating a more external locus of control. Previous research has reported a Cronbach's alpha value of .92, indicating high internal consistency (Campis et al., 1986).

The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988)

The MSPSS was used to assess caregiver perceived social support. The scale contains twelve items (e.g., "My family is willing to help me make decisions") on a seven-point Likert scale ranging from 1 "Very strongly disagree" to 7 "Very strongly agree" that measure perceived social support from friends, from family, and from significant others. Higher scores indicate higher levels of perceived social support, with possible total scores ranging from 12 to 84. Zimet et al. (1990) found this measure to have high internal consistency, with Cronbach's alpha values ranging from .84 to .92.

Economic Support

Economic support was measured by two items developed by Falk et al. (2014) (See Appendix E). Responses are scored on a five-point Likert scale ranging from 1 "Strongly disagree" to 5 "Strongly agree". Possible total scores range from two to 10, with higher scores indicating higher levels of perceived economic support. Falk et al. (2014) demonstrated good internal consistency of the two items, with a Cronbach's alpha of .84.

Procedure

Data collection occurred from June to August 2021. Advertisements for the study contained a QR code and URL link directing participants to complete an online survey using the LimeSurvey platform on their own electronic device. Caregivers of more than one child were asked to respond in relation to one child only. It was estimated to take participants 30 minutes to complete the survey. Upon completion of the survey, participants were provided a

link to an external page (to maintain anonymity of answers) to receive course credit for participation if they were a UTAS student, or the opportunity to enter a draw to win a gift voucher.

Data Analysis

The study employed a cross-sectional correlational research design. The predictor variables for the regressions described below were child social and interpersonal deficits, child externalised behaviour, maladaptive caregiver cognitions, and socio-economic support. The outcome variables were caregiver depression, anxiety, and stress. The current study was a replication of previous Model A research, thus the measures outlined in Table 3 were used for the respective Model A variables. However, only the CBCL/6-18 subscale 'rule-breaking behaviour' was included in analyses as a measure of conduct problems. As the CBCL/1.5-5 does not include a subscale capturing rule breaking behaviour or conduct problems, these data could not be imputed into the model for respondents reporting on children aged under 6 years (n=21). All other data for these participants were retained in analyses.

Data were analysed using jamovi version 2.0 (The jamovi project, 2021). Assumptions of normality, homoscedasticity, and linearity were assessed prior to statistical analysis. A single outlier was detected but not removed, as some extreme scores were expected given the clinical nature of the study. Correlation analyses were used to assess inter-correlations of all Model A variables. Hierarchical linear regression analyses were conducted to investigate the validity of Model A in predicting caregiver depression, anxiety, and stress in each participant group. At each step in the regression analyses, adjusted R-square values were used as an indicator of the amount of variance in depression, anxiety, and stress accounted for by the predictor variables.

Structural Equation Modeling (SEM) was conducted in previous Model A research by Bones et al. (2019). SEM would have determined if Model A was a good fit for the data

obtained in this study, based on whether it demonstrated invariance between caregivers of children in each group. However, the sample size of the current study constrained the use of SEM.

<div align="center">**Results**</div>

Descriptive Statistics

Means, standard deviations, and internal reliability coefficients for all study variables are presented in Table 3.

As shown in Table 3, all Cronbach's alpha values were above .73, indicating no problems with internal reliability (Tavakol & Dennick, 2011). Upon inspection of histograms, social support demonstrated a negative skew, while aggressive behaviour, anxiety, and conduct problems had a positive skew. Regression analyses are robust to violations of normality (Knief & Forstmeier, 2021), thus the original data were retained for the analyses.

Table 3

Descriptive Statistics and Cronbach's Alpha Values of Model A Variables for Each Group

Measure	Variable	Whole sample			Caregivers of children with ASD		Caregivers of children with ADHD		Caregivers of children with ASD and ADHD		Caregivers of typically developing children	
		M	*SD*	α	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
DASS-21	Depression	13.30	11.30	.92	15.46	9.99	12.64	10.84	17.06	13.47	9.43	9.21
	Anxiety	8.32	7.99	.86	9.61	7.32	7.27	6.41	10.23	9.90	6.72	7.33
	Stress	17.67	8.71	.88	18.88	7.50	17.73	8.23	19.77	10.09	15.22	8.11
MSPSS	Social Support	56.64	17.76	.95	52.24	17.45	59.30	18.18	53.00	17.39	60.46	17.16
Falk et al. (2014)	Economic Support	6.32	2.74	.78	5.00	2.63	6.61	2.78	6.26	2.54	6.99	2.69
PCRI	Limit Setting Ability	89.21	9.65	.77	89.24	7.96	90.89	7.95	94.28	9.88	84.08	9.06
PLOC-SF	Caregiver Locus of Control	65.74	9.03	.73	66.59	8.93	65.14	9.32	69.02	8.60	63.02	8.48
CBCL	Aggressive Behaviour	10.29	8.22	.95, .91 [a]	10.10	7.72	11.25	7.48	13.76	8.93	7.03	7.22
CBCL	Conduct Problems	3.82	3.90	.81	3.55	2.68	4.58	4.59	5.04	3.74	2.40	3.64
SCQ	ASD Severity	20.70	7.30	.86	21.12	7.22	-	-	20.38	7.42	-	-
DBRS-II	ADHD Severity	50.84	15.40	.90	-	-	46.32	14.35	54.59	15.37	-	-

Note. α = Cronbach's alpha

Correlation Analysis

Pearson correlation coefficients were calculated between variables for each group to detect any preliminary issues with collinearity prior to completing regression analysis (see Appendix F). Between all four groups, correlations between depression, anxiety, and stress ranged between .60 and .86 ($p < .001$). These moderate to strong relationships were anticipated due to the moderately strong factor correlations of the DASS-21 (Lovibond & Lovibond, 1995). This was not considered a collinearity violation as the current study entered each of these factors in a different regression model.

Between all four groups, moderate to strong positive correlations were found between economic support and social support, ranging from .58 to .72 ($p < .001$). There were also strong correlations found between some of the child-centric variables in Model A. A strong positive correlation of .76 ($p < .001$) was identified between child conduct problems and aggressive behaviour as reported by caregivers of children with ASD. A correlation of .76 ($p < .001$) was also found between child ADHD severity and conduct problems reported by caregivers of children with ADHD. Similarly, child ADHD severity and aggressive behaviour were found to be strongly and positively correlated in caregiver reports of children with ADHD ($r = .70$, $p < .001$) and caregiver reports of children with comorbid ASD and ADHD ($r = .71$, $p < .001$). Although the observed correlations may suggest an issue with collinearity, all variables were retained as the aim of the current study was to test an existing model. Additionally, collinearity diagnostic statistics in the regression models indicated that this was not of concern, and the study's sample size may have increased the likelihood of observing significant correlations.

Hierarchical Regression Analysis

Hierarchical regression analyses were conducted to determine which Model A variables could be used to predict depression, anxiety, and stress in caregivers of children

with ASD, ADHD, comorbid ASD and ADHD, and of typically developing children. In line with previous Model A research (Bones, 2019; Scott, 2018), a seven-stage hierarchical regression was run for each dependent variable of depression, anxiety, and stress, for the three groups with a diagnosis. In each analysis, child social and interpersonal deficits were entered at stage one, social support at stage two, parental locus of control at stage three, aggressive behaviour at stage four, conduct problems at stage five, limit setting ability at stage six, and economic support at stage seven. A six-stage hierarchical regression was run for caregivers of typically developing children, with variables included in the same order as outlined above, with the exclusion of child social and interpersonal deficits. General assumptions for regression analyses were tested prior to each analysis. Across all regression models, VIF values were less than 10 and tolerance values were greater than .02, indicating no significant issues with multivariate collinearity (Tabachnick & Fidell, 2001).

All quantile-quantile plots revealed that the distribution of errors was acceptable. Summaries of the regression statistics for the final regression models that included all Model A variables for depression, anxiety, and stress are presented in Tables 4, 5, and 6. Summaries of all 12 hierarchical regression analyses, including all regression models, are presented in Appendix G.

Table 4

Hierarchical Regression Results of the Final Regression Model When Predicting Depression

Group	B	β	t	Adjusted R^2	F	p
Typically Developing				0.15	2.69	.024
Social Support	-0.11	-0.20	-0.99			
PLOC	0.16	0.12	0.68			
Aggressive Behaviour	-0.23	-0.14	-0.79			
Conduct Problems	0.75	0.28	1.39			

	B	β	t			
Limit Setting Ability	0.77	0.24	1.64			
Economic Support	0.24	0.07	0.32			
ASD				0.29	3.16	.013
ASD Severity	-0.02	-0.01	-0.10			
Social Support	-0.33	-0.58	-2.83*			
PLOC	0.36	0.33	1.64			
Aggressive Behaviour	-.13	0.10	0.35			
Conduct Problems	-0.43	-0.11	-0.41			
Limit Setting Ability	0.12	0.04	0.22			
Economic Support	0.28	0.07	0.34			
ADHD				0.33	3.71	.005
ADHD Severity	0.05	0.07	0.27			
Social Support	-0.09	-0.16	-0.90			
PLOC	0.59	0.48	3.02*			
Aggressive Behaviour	-0.54	-0.37	-1.86			
Conduct Problems	0.80	0.34	1.66			
Limit Setting Ability	0.23	0.07	0.51			
Economic Support	0.16	0.04	0.23			
ASD & ADHD				0.63	11.3	<.001
ASD Severity	0.46	0.25	2.16*			
ADHD Severity	0.22	0.26	1.88			
Social Support	-0.33	-0.42	-3.19*			
PLOC	0.56	0.36	3.03*			
Aggressive Behaviour	-0.13	-0.08	-0.47			
Conduct Problems	-0.05	-0.01	-0.10			
Limit Setting Ability	0.24	0.07	0.58			
Economic Support	1.01	0.19	1.70			

Note. * $p < .05$

B = Unstandardized Regression Coefficient

$β$ = Standardized Coefficient

PLOC = parental locus of control

Models for Depression

As shown in Table 4, Model A was upheld in all caregiving groups when predicting

depression scores, which was evidenced by the final regression model (containing every

Model A variable) demonstrating significance. Of note, however, is that more parsimonious regression models demonstrated significance and accounted for a large proportion of the variance in depression scores. In caregivers of typically developing children, this was regression model 2, with social support and parental locus of control as the included variables ($F(2, 54) = 5.83$, $p = .005$), accounting for 15% of the variance. The remaining regression models (models 3 to 6) did not significantly improve the model fit.

Regression model 3, with child social and interpersonal deficits, social support, and parental locus of control as the included variables, accounted for the most variance in depression in caregivers of children with ASD, $F(3, 34) = 8.05$, $p < .001$, caregivers of children with ADHD, $F(3, 36) = 6.24$, $p = .002$, and caregivers of children with comorbid ASD and ADHD, $F(4, 44) = 21.85$, $p < .001$, accounting for 36%, 34%, and 64% of the variance respectively. The remaining regression models (models 4 to 7) indicated that the addition of aggressive behaviour, conduct problems, limit setting ability, and economic support did not significantly improve the model fit.

Table 5

Hierarchical Regression Results of the Final Regression Model When Predicting Anxiety

Group	B	β	t	Adjusted R^2	F	p
Typically developing				0.26	4.23	.002
Social Support	-0.13	-0.31	-1.58			
PLOC	-0.01	-0.01	-0.05			
Aggressive Behaviour	-0.08	-0.07	-0.39			
Conduct Problems	1.03	0.51	2.68*			
Limit Setting Ability	0.29	0.12	0.88			
Economic Support	0.38	0.14	0.70			
ASD				0.17	2.10	.075
ASD Severity	0.34	0.33	1.98			
Social Support	-0.09	-0.21	-0.96			

	B	β	t	R^2	F	p
PLOC	0.18	0.22	1.03			
Aggressive Behaviour	-0.05	-0.05	-0.18			
Conduct Problems	0.13	0.05	0.16			
Limit Setting Ability	0.16	0.68	0.36			
Economic Support	0.17	-0.06	-0.26			
ADHD				0.20	2.37	.045
ADHD Severity	0.17	0.38	1.37			
Social Support	-0.07	-0.18	-0.95			
PLOC	0.32	0.44	2.48*			
Aggressive Behaviour	-0.36	-0.40	-1.85			
Conduct Problems	-0.08	-0.05	-0.24			
Limit Setting Ability	-0.08	-0.04	-0.25			
Economic Support	0.25	0.12	-.55			
ASD & ADHD				0.55	8.26	<.001
ASD Severity	0.51	0.38	2.94*			
ADHD Severity	0.12	0.18	1.20			
Social Support	-0.20	-0.35	-2.40*			
PLOC	0.40	0.35	2.66*			
Aggressive Behaviour	-0.28	-0.24	-1.27			
Conduct Problems	0.16	0.06	0.37			
Limit Setting Ability	0.33	0.13	0.99			
Economic Support	1.00	0.26	2.06			

Note. * = $p < .05$

B = Unstandardized Regression Coefficient

$β$ = Standardized Coefficient

PLOC = parental locus of control

Models for Anxiety

Model A was upheld in the ASD, ADHD, and typically developing caregiving groups when predicting caregiver anxiety scores (See Table 5). This was evidenced by each final regression model demonstrating significance. However, other regression models demonstrated parsimony, significance, and accounted for a large proportion of the variance in anxiety scores. None of the remaining regression models significantly improved model fit.

In caregivers of typically developing children, the most parsimonious regression model was model 4, with social support, parental locus of control, aggressive behaviour, and conduct problems as the included variables, $F(4, 52) = 6.15$, $p < .001$, accounting for 27% of the variance. In caregivers of children with ADHD, the most parsimonious regression model was model 4 with ADHD severity, social support, parental locus of control, and aggressive behaviour as the included variables, $F(4, 35) = 4.36$, $p = .006$, accounting for 26% of the variance. In caregivers of children with comorbid ASD and ADHD, this was model 3, with child social and interpersonal deficits, social support, and parental locus of control as the included variables $F(4, 44) = 14.50$, $p < .001$, accounting for 53% of the variance.

In contrast, Model A was not upheld in caregivers of children with ASD when predicting anxiety scores, as the final regression model with all Model A variables included did not reach significance. However, regression model 3 with ASD severity, social support, and parental locus as the included variables was the most parsimonious in significantly predicting anxiety in caregivers of children with ASD. This model accounted for 26% of the variance, $F(3, 34) = 5.36$, $p = .004$. Regression models 4-6 did not significantly improve the model fit, and model 7 was non-significant.

Table 6

Hierarchical Regression Results of the Final Regression Model When Predicting Stress

Group	B	β	t	Adjusted R²	F	p
Typically Developing				0.11	2.19	.060
Social Support	-0.06	-0.12	-0.67			
PLOC	0.11	0.10	0.52			
Aggressive Behaviour	0.21	0.15	0.83			
Conduct Problems	0.15	0.06	0.31			

	B	β	t	R^2	F	p
Limit Setting Ability	0.5	0.22	1.42			
Economic Support	-0.07	-0.02	-0.11			
ASD				0.18	2.17	.066
ASD Severity	0.05	0.06	0.34			
Social Support	-0.12	-0.28	-1.26			
PLOC	0.23	0.31	1.47			
Aggressive Behaviour	-0.09	-0.10	-0.33			
Conduct Problems	0.16	0.06	0.22			
Limit Setting Ability	0.37	0.18	0.94			
Economic Support	-0.11	-0.04	-0.19			
ADHD				0.25	2.86	.020
ADHD Severity	0.26	0.44	1.65			
Social Support	-0.03	-0.07	-0.39			
PLOC	0.26	0.28	1.65			
Aggressive Behaviour	-0.44	-0.39	-1.85			
Conduct Problems	-0.18	-0.10	-0.47			
Limit Setting Ability	0.48	0.19	1.30			
Economic Support	-0.63	-0.21	-1.13			
ASD & ADHD				0.62	10.91	<.001
ASD Severity	0.21	0.15	1.32			
ADHD Severity	0.12	0.18	1.33			
Social Support	-0.31	-0.53	-4.00*			
PLOC	0.19	0.16	1.33			
Aggressive Behaviour	0.01	0.01	0.06			
Conduct Problems	-0.13	-0.49	-0.34			
Limit Setting Ability	0.75	0.29	2.40*			
Economic Support	1.07	0.27	2.37*			

Note. * = $p < .05$

B = Unstandardized Regression Coefficient

$β$ = Standardized Coefficient

PLOC = parental locus of control

Models for Stress

As shown in Table 6, Model A was upheld in caregivers of children with ADHD and comorbid ASD and ADHD when predicting stress scores; evidenced by each final regression

model demonstrating significance. However, these final regression models were not statistically significant improvements from more parsimonious regression models. Model 3, with child social and interpersonal deficits, social support, and parental locus of control as the included variables was more parsimonious in predicting stress in caregivers of children with ADHD, $F(3, 36) = 4.47$, $p = .009$, explaining 21% of the variance, and in caregivers of children with comorbid ASD and ADHD, $F(4, 44) = 14.50$, $p < .001$, explaining 54% of the variance.

In contrast, Model A was not upheld in caregivers of children with ASD or typically developing children when predicting stress, as the final regression model containing all Model A variables did not demonstrate significance. However, regression model 3 with ASD severity, social support, and parental locus as the included variables was the most parsimonious in significantly predicting stress in caregivers of ASD children. This model accounted for 25% of the variance, $F(3, 34) = 5.09$, $p = .005$. In caregivers of typically developing children, regression model 3, with social support, parental locus of control and aggressive behaviour as the included variables demonstrated significance and parsimony, $F(3, 53) = 3.72$, $p = .017$, explaining 13% of the variance in stress scores.

Across all 12 hierarchical linear regression analyses, it was demonstrated that child social and interpersonal deficits, social support, and parental locus of control largely predicted overall levels of distress to the greatest extent, as evidenced by standardised Beta weights, and the pattern of variables included in the regression models that demonstrated parsimony, significance, and high adjusted R^2 values.

Discussion

The first aim of the current study was to examine whether Model A can predict mental health outcomes in caregivers of children with ASD, ADHD, and typically developing children as found in previous research (Bones et al., 2019; Falk et al., 2014; Scott; 2018). The

second aim was to investigate the predictive capacity of Model A in a cohort of caregivers of children with comorbid ASD and ADHD.

The first hypothesis, that Model A would be validated by accounting for a significant proportion of the variance in distress experienced by caregivers of children with ASD, ADHD, and typically developing children, was supported to some extent. The final regression model, including all Model A variables, remained significant when predicting distress in caregivers of children with ADHD. This suggests that Model A effectively predicts distress in caregivers of children with ADHD in line with the findings of Scott (2018). This is evidence of Model A's universality in a population of caregivers of children with ADHD, demonstrating that all Model A variables are potential targets of clinical intervention when addressing caregiver distress.

However, more parsimonious regression models demonstrated significance and accounted for a larger proportion of the variance when predicting distress in caregivers of children with ADHD. Depression and stress were positively predicted by child social and interpersonal deficits along with an external locus of control, and negatively predicted by social support; together accounting for 34% of the variance in symptoms of depression and 21% of the variance in symptoms of stress. Anxiety was positively predicted by child social and interpersonal deficits and an external locus of control, and negatively predicted by social support; together accounting for 26% of the variance in symptoms of anxiety. Given that later regression models did not demonstrate a better fit in terms of predictive utility, these results suggest that in situations where time and resources may be limited, the variables identified by more parsimonious models should be the focus of interventions of caregiver distress.

In the sample of caregivers of children with ASD however, the pattern of results was different. While the final regression model demonstrated significance when predicting depression, it failed to reach significance when predicting anxiety and stress in caregivers of

children with ASD. This indicates that Model A holds for this group when predicting

depression, but does not significantly predict anxiety and stress. This finding contrasts with

conclusions drawn by Falk et al. (2014) and Bones et al. (2019), who demonstrated that

Model A predicts depression, anxiety, and stress in caregivers of children with ASD. In the

current study, in each step of the regression models for both anxiety and stress, all F statistics

remained significant, but the addition of economic support in the final step rendered Model

A's predictive capacity non-significant.

The finding that the addition of economic support in the regression model upheld

Model A in the ADHD sample but not in the ASD sample, may reflect the discrepancy in

access to economic support between these two diagnoses in Australia. According to the

National Disability Insurance Scheme (NDIS), ADHD is not listed as a recognised disorder

that is eligible for government funding, whereas ASD is likely to meet the disability

requirements of the NDIS Act (NDIS, 2019). Consequently, while families of children with

ASD have greater access to government funding in Australia, families of children with

ADHD may be required to allocate more personal economic resources to assist with their

child's healthcare and educational requirements. For this reason, there is a need to raise

awareness of the socioeconomic burden of ADHD in Australia, and a substantial need for

targeted policy and interventions to help address the many structural challenges faced by

these families (Sciberras et al., 2020). Although the ASD group in the current study reported

a marginally lower mean level of economic support, the enhanced access this group has to

economic and structural support in Australia may provide an explanation as to why economic

support predicted distress in caregivers of children with ADHD, but not those with ASD.

Although the inclusion of economic support in the regression model rendered Model

A non-significant in predicting anxiety and stress in caregivers of children with ASD, more

parsimonious regression models demonstrated significance and accounted for a large

proportion of the variance when predicting distress in this group. Depression, anxiety, and stress were positively predicted by child social and interpersonal deficits and an external locus of control, and negatively predicted by social support; accounting for 36% of the variance in symptoms of depression, 26% of the variance in symptoms of anxiety, and 25% of the variance in symptoms of stress. This finding provides support for the implementation of caregiver-focused interventions that prioritise these three variables in ASD populations.

In caregivers of typically developing children, while the final regression model demonstrated significance when predicting depression and anxiety, it failed to reach significance when predicting stress in caregivers of typically developing children. This indicates that Model A holds for this group when predicting depression and anxiety, but does not significantly predict stress, in contrast to the findings of Scott (2018). This finding may be due to caregivers of typically developing children being a highly heterogeneous group. Alternatively, this pattern of results may differ from those of Scott (2018) due to cohort effects, with the impact of the COVID-19 pandemic possibly altering the factors that significantly contribute to caregiver stress.

However, more parsimonious regression models demonstrated significance and accounted for a large proportion of the variance when predicting distress in caregivers of typically developing children. Depression was negatively predicted by social support and positively predicted by parental locus of control; together accounting for 15% of the variance in symptoms. Stress was negatively predicted by social support and positively predicted by parental locus of control and aggressive behaviour; accounting for 13% of the variance in symptoms. Anxiety was negatively predicted by social support and positively predicted by parental locus of control, aggressive behaviour and conduct problems; together accounting for 27% of the variance in symptoms. This indicates that both caregiver- and child-centric variables are potential targets of clinical intervention when addressing caregiver distress.

The current study also recruited caregivers of children with a comorbid diagnosis of ASD and ADHD; a population that has not been included in previous Model A research. The second hypothesis, that Model A would be validated in caregivers of these children, was supported. This was evidenced by the final regression model with all Model A variables remaining significant when predicting depression, anxiety, and stress in caregivers in this group. Model A's utility may thus extend to caregivers of children with comorbid diagnoses. The finding that alongside child-centric factors, caregiver-centric factors are important predictors of caregiver distress contributes to the limited research on the effect of comorbid ASD and ADHD on caregiver distress (Harkins et al., 2021; Kern et al., 2015; van Steijn et al., 2014). It is logical that the shared symptomology of ASD and ADHD, and the contribution of both child- and caregiver-centric factors that predict distress, contributed to Model A being upheld in the comorbid group. However, this finding suggests that economic support does predict distress in this population, unlike the ASD group. One possible explanation may be that NDIS funded support and intervention would be targeted towards the ASD diagnosis, not ADHD (NDIS, 2019).

However, as observed in the other groups investigated, more parsimonious regression models demonstrated significance and accounted for a larger proportion of the variance when predicting distress in caregivers of children with a comorbid diagnosis. Distress was positively predicted by child social and interpersonal deficits and an external locus of control, and negatively predicted by social support; together accounting for 64% of the variance in symptoms of depression, 53% of the variance in symptoms of anxiety, and 54% of the variance in symptoms of stress.

The current study thus provides further support and empirical validation of Model A. Largely, distress in each of the four caregiving groups was predicted to the greatest extent by the same factors. These were child social and interpersonal deficits, social support, and

parental locus of control. Results indicate that, in contrast to the previous literature, child-centric factors are not the sole predictors of caregiver distress (McRae et al., 2020; Shepherd et al., 2018). Instead, in line with previous Model A research and the Double ABCX model, the present results suggest that caregiver distress is predicted by a combination of both caregiver- and child-centric factors. The specific variables identified by more parsimonious models in each group provide direction for interventions that aim to efficiently reduce caregiver distress.

No individual variable was found to be a unique predictor of caregiver distress in these groups, supporting the application of a model that simultaneously analyses multiple predictor variables and more accurately captures the real-world experiences of caregivers in these groups (Falk et al., 2014; McRae et al., 2020).

Current ASD and ADHD treatment approaches

Results of the current study indicate that greater levels of child social and interpersonal deficits (ASD or ADHD severity) significantly predicted greater levels of caregiver distress. Thus, one avenue of focus to address caregiver distress is the remediation of child problem behaviour through the implementation of targeted intervention. Currently, child behavioural interventions and pharmacological interventions are the primary focus of ASD and ADHD interventions, including cognitive-behavioural therapy and social skills training (Theule et al., 2018). Caregivers are integral to the implementation of child interventions (Bones et al., 2019). It is recognised that focusing purely on child-centred interventions neglects the important role that caregivers play in management of their child's challenging behaviour (Osbourne et al., 2008). Thus, a more family-based approach that addresses both child and caregiver-centric factors within the same framework is needed in families of children with ASD and/or ADHD (Falk et al., 2014; McRae et al., 2020; Sim et al., 2018).

Implications for caregiver interventions

The results of the current study highlight the need for increased implementation and support of caregiver interventions to target caregiver distress. Previous research has demonstrated that caregiver psychological distress is associated with increased use of maladaptive parenting practices, poor child outcomes, and poor implementation of child interventions (Derguy et al., 2015; McRae et al., 2020). For example, caregivers with higher levels of distress have been found to respond to challenging child behaviours with less consistent and harsher discipline (McRae et al., 2020). These parenting behaviours have been theorised to lead to higher levels of child externalising behaviour, a pattern of interactions that emphasises the vulnerability of the parent-child interaction (McRae et al., 2020). Consequently, it is essential that service providers and employ a more holistic intervention approach, by implementing caregiver-focused interventions and assessments alongside child-centric interventions to improve outcomes for both the caregiver and the child.

The current study provides support for the implementation of caregiver-focused interventions that specifically target parental locus of control and social support, as these two factors were significant predictors of caregiver distress. Caregivers of children with a diagnosis of ASD, ADHD, or a comorbid diagnosis in the current study displayed a more external locus of control than caregivers of typically developing children (Campis et al., 1986), congruent with previous research (Hassal et al., 2005; Freed & Tompson, 2011; Scott, 2018). An external locus of control has found to be associated with increased caregiver distress (Bones et al., 2019; Falk et al., 2014; Lloyd & Hastings, 2009; Scott, 2018), a finding also demonstrated by results of the current study.

The association between an external locus of control and higher levels of distress may be explained by research suggesting that the perception of being out of control of the child's behaviour can be associated with feelings of low parental efficacy and perceptions of the

child's behaviour dominating one's life (Freed & Tompson, 2011; Lloyd & Hastings, 2009). Additionally, consistent with Seligman's (1974) theory of learned helplessness, caregivers with an external locus of control may experience hopelessness in the face of challenging child behaviour; feeling unable to help their children regulate their behaviour and emotions (Coyne & Thompson, 2011).

Previous research suggests that parental locus of control tends to be a relatively stable construct over time (Lloyd & Hastings, 2009; Nowicki et al, 2018). Interventions should therefore focus on providing caregivers with skills and strategies to cope with negative cognitions. Acceptance and Commitment Therapy (ACT) may be an adaptive therapeutic technique to address maladaptive caregiver cognitions. ACT is a psychological intervention that incorporates acceptance, mindfulness techniques, and commitment and behaviour strategies aimed at enhancing psychological flexibility (Blackledge & Hayes, 2008). 'Acceptance' is a particularly relevant approach, as many of the behaviours and challenges children with neurodevelopmental disorders experience are unlikely to change in childhood and adolescence (Blackledge & Hayes, 2008). Rather than actively challenging caregivers' difficult thoughts and feelings, ACT emphasises acceptance of difficult emotions and thought patterns, clarification of the individual's goals and values, and defusion from maladaptive cognitions. This approach has been considered well-suited to caregivers of children with neurodevelopmental disorders such as ASD and ADHD. These types of interventions implement therapeutic techniques to enhance strategies for managing challenging child behaviour and motivate caregivers to persevere in the face of difficulty (Freed & Tompson, 2011).

Alternatively, Cognitive Behaviour Therapy (CBT) is an evidence-based therapy that teaches clients to identify, evaluate, and respond to their negative cognitions (Beck, 2011). CBT has the potential to be beneficial for caregivers of children with neurodevelopmental

disorders, as maladaptive caregiver cognitions are primary predictors of distress in this population (Bones et al., 2019; Falk et al., 2014; Scott, 2018). Furthermore, there is evidence to suggest that locus of control beliefs may be related to other coping strategies and resources (Beresford, 1994). Locus of control has been considered a particular expression of Bandura's (1982) concept of self-efficacy, which has a central influence on emotional reactions, cognitive processes, and behaviours – all of which are addressed in CBT.

The results of this study also highlight a factor that significantly predicts distress that can be improved without specific formal intervention: social support. Results of hierarchical regression analyses indicated a negative correlation between social support and distress across all four caregiving groups. Improving access to social support can be done on an individual level. For example, caregivers may consider seeking support from family members, friends, or support groups related to their child's diagnosis in person, or via the internet. Social support is also often identified as a key focus of interventions and formal support from healthcare services and practitioners aimed at connecting caregivers with support groups and community resources (Bluth et al., 2013; Dunn et al., 2001).

Furthermore, Hassall (2005) has found preliminary evidence suggesting that social support appears to contribute to an internal locus of control in caregivers, through association with adaptive coping strategies and cognitive appraisals. This may suggest that caregiver-focused interventions would benefit from targeting these two factors simultaneously.

Limitations

The results of this study should be interpreted with some caution, particularly in relation to sampling and demographic limitations. Approximately 95% of participants were mothers, the majority were primary caregivers (97%), and most had a middle-class background (e.g., 45% of participants had a total household income over $120,000, and 58% had completed a Bachelor's degree or higher). Thus, the caregiver distress levels reported

may not be representative of the experiences of fathers, of non-primary caregivers, or of the wider population of caregivers of children with ASD and/or ADHD. Future research should aim to recruit a larger proportion of these underrepresented groups. For example, research suggests that differences in predictive variables may exist when predicting distress in fathers and parents who are not primary caregivers (Falk et al., 2014). Moreover, 42% of caregivers reported having a current diagnosed medical condition. Physical and mental health conditions may contribute to caregiver distress and may have influenced the reported levels of distress in this study. Elevated levels of distress and mental health difficulties have been found to contribute to caregivers misinterpreting child behaviour as more extreme, or negative, due to maladaptive caregiver cognitions (Hassall et al., 2005; Freed & Tompson, 2011).

This study did not achieve the required sample size originally identified in the power analysis, and thus, was underpowered. However, the study's sample size did meet a 10:1 ratio of cases to predictor variables, and therefore was considered an adequate sample size for hierarchical linear regression.

It should also be noted that data collection for the current study was conducted during a time where the impacts of the COVID-19 pandemic were still being felt across Australia. Consequently, the potential for pandemic-related impacts on distress levels should not be disregarded (Shorey et al., 2021; Masi et al., 2021). In families of children with neurodevelopmental disorders, significant increases in distress levels experienced by both the child and the caregiver have been recognised (Cameron et al., 2020; Masi et al., 2021). This is likely due to changes in health care delivery and support services, diminished social and economic support networks, and the uncertain efficacy of telehealth services for these children (Shorey et al., 2021; Masi et al., 2021). Thus, the possible extraneous variable of pandemic-related stress should not be discounted when interpreting the study's results.

Future Research

The current study demonstrated that caregiver-centric variables, alongside child-centric factors, contribute to the prediction of distress in caregivers of children with ASD, ADHD, comorbid ASD and ADHD, and of typically developing children. Future research could recruit a larger sample or combine existing Model A data to conduct SEM to determine whether Model A is a good fit for the data in these populations, and whether the model demonstrates invariance between groups.

The results of the current study suggest that Model A may not significantly predict anxiety and stress in caregivers of children with ASD. However, as Model A is now validated within ADHD (Scott, 2018), comorbid ASD and ADHD, and the variables that significantly predict distress within ASD populations have been identified (Bones et al. 2019), future research could utilise the empirical validation of Model A to inform intervention. Examples of contributions could include the development of a new caregiver-focused intervention, or the alteration of an existing intervention that targets caregiver-centric variables such as socio-economic support and maladaptive caregiver cognitions.

Future research may also examine the relationship between caregiver distress and other variables not included in Model A, such as parental ASD or ADHD symptoms. Caregiver distress research pays little attention to the role of caregiver psychopathology, despite the high heritability of ASD and ADHD being well established (Theule et al., 2011; van Steijn et al., 2014). Another variable of consideration may be resilience; a positive adaptation process that facilitates coping with adversity and distress (Ameis et al., 2020). In families of children with neurodevelopmental disorders, resilience can be associated with numerous variables such as social support, locus of control, optimism, coping style, parental-efficacy, acceptance, and positive family outcomes (Ameis et al., 2020; Iacob et al., 2020).

Resilience may thus be an important protective factor against caregiver distress, and worthy of further research in these populations.

It is also important to consider the positive aspects of caring for a child with a neurodevelopmental disorder. Research and anecdotal evidence suggest that many families adjust well to their child's diagnosis, and experience positive outcomes (Lloyd & Hastings, 2009). Hoffman et al. (2009) observed that while caregivers of children with neurodevelopmental disorders experience elevated levels of parenting stress, they continued to report emotional closeness with their child, suggesting that the parent-child relationship is not jeopardised by the child's symptoms and behaviours.

Conclusion

This study provides further validation of Model A and supports the findings of Falk et al. (2014), Bones et al. (2019), and Scott (2018) that caregiver-centric factors predict distress alongside child-centric factors. Further, results of the current study clearly indicate that to effectively address distress, caregiver-focused interventions need to target inadequacies in social support and maladaptive caregiver cognitions. Such interventions could be designed to be implemented in conjunction with child-focused interventions (Bones et al., 2019).

The current study also examined Model A in relation to caregivers of children with a comorbid diagnosis of ASD and ADHD, finding that Model A was upheld, and the same factors were predictive of distress in this population compared to the other three groups examined. These findings contribute substantial evidence to the current literature and provide direction for interventions to support caregivers of children with a comorbid diagnosis in their experiences of distress.

The finding that child social and interpersonal deficits, social support, and parental locus of control are key predictors of distress in caregivers of children with ASD, ADHD, and comorbid ASD and ADHD suggests that while child symptom severity is an important

factor, it should not be the sole focus of interventions. It is recommended that ASD and ADHD therapeutic interventions employ a more holistic, family-systems approach by addressing not only the child and the parent-child relationship, but the caregiver themselves.

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Appendices

Appendix A

Ethics Approval Letter

07/05/2021

To: Associate Professor Norris

Project ID: 17272

Project Title: Testing a Model Predicting Depression, Anxiety and Stress in Parents of Children with Down's Syndrome and Attention-Deficit/Hyperactivity Disorder (H0017272)

The amendment received in support of the above named project has been approved by the Tasmania Social Sciences Human Research Ethics Committee on the 7 May 2021.

Approval has been granted for the addition of two further student researchers who have commenced their studies in the Honours program at UTAS: Eleanor Riewoldt (UTAS Psychology Honours student) and Georgia Hamilton (UTAS Psychology Honours Student) and the removal of two student researchers as they have completed their studies at UTAS: Sarah Scott and Johanna van der Hek, and for the following documentation:

Submission Document Name	Submission Document File Name	Submission Document Type	Submission Document Date	Submission Document Version
Human Ethics - Participant Information Sheet and Consent Form_17272	Human Ethics - Participant Information Sheet and Consent Form_17272.docx	PARTICIPANT INFORMATION AND CONSENT FORM	26/04/2021	

Please ensure that all investigators involved with this project have cited the approved versions of the documents listed within this letter and use only these versions in conducting this research project.

This approval constitutes ethical clearance by the Tasmania Social Sciences Human Research Ethics Committee. The decision and authority to commence the associated research may be dependent on factors beyond the remit of the ethics review process. For example, your research may need ethics clearance from other organisations or review by your research governance coordinator or Head of Department. It is your responsibility to find out if the approvals of other bodies or authorities are required. It is recommended that the proposed research should not commence until you have satisfied these requirements.

In accordance with the National Statement on Ethical Conduct in Human Research 2007 (updated 2018), it is the responsibility of institutions and researchers to be aware of both general and specific legal requirements, wherever relevant. If researchers are uncertain they should seek legal advice to confirm that their proposed

research is in compliant with the relevant laws. University of Tasmania researchers may seek legal advice from Legal Services at the University.

All committees operating under the Human Research Ethics Committee (Tasmania) Network are registered and required to comply with the National Statement on the Ethical Conduct in Human Research 2007 (updated 2018).

Therefore, the Chief Investigator's responsibility is to ensure that:

1) All investigators are aware of the terms of approval, and that the research is conducted in compliance with the HREC approved protocol or project description.
2) Modifications to the protocol do not proceed until approval is obtained in writing from the HREC. This includes, but is not limited to, amendments that:

   i)   are proposed or undertaken in order to eliminate immediate risks to participants;
   ii)   may increase the risks to participants;
   iii)   significantly affect the conduct of the research; or
   iv)   involve changes to investigator involvement with the project.

Please note that all requests for changes to approved documents must include a version number and date when submitted for review by the HREC.

3) Reports are provided to the HREC on the progress of the research and any safety reports or monitoring requirements as indicated in NHMRC guidance.

Guidance for the appropriate forms for reporting such events in relation to clinical and non-clinical trials and innovations can be located under the ERM "Help Tab" in "Templates". All adverse events must be reported regardless of whether or not the event, in your opinion, is a direct effect of the therapeutic goods being tested.

4) The HREC is informed as soon as possible of any new safety information, from other published or unpublished research, that may have an impact on the continued ethical acceptability of the research or that may indicate the need for modification of the project.
5) All research participants must be provided with the current Participant Information Sheet and Consent Form, unless otherwise approved by the Committee.
6) This study has approval for four years contingent upon annual review. A Progress Report is to be provided on the anniversary date of your approval. Your first report is due on the anniversary of your approval, and you will be sent a courtesy reminder closer to this due date. Ethical approval for this project will lapse if a Progress Report is not submitted in the time frame provided.
7) A Final Report and a copy of the published material, either in full or abstract, must be provided at the end of the project.
8) The HREC is advised of any complaints received or ethical issues that arise during the course of the project.
9) The HREC is advised promptly of the emergence of circumstances where a court, law enforcement agency or regulator seeks to compel the release of findings or results. Researchers must develop a strategy for addressing this and seek advice from the HREC.

Kind regards,

Ethics Executive Officer

UNIVERSITY*of*
TASMANIA

Appendix B

Participant Information Sheet and Informed Consent

TESTING A MODEL PREDICTING DEPRESSION, ANXIETY AND STRESS IN PARENTS OF CHILDREN BORN PRETERM OR WITH DEVELOPMENTAL DISORDERS

Invitation:

You are invited to participate in a research study examining the factors predicting depression, anxiety and stress in parents of children born preterm, or with developmental disorders such as Attention-Deficit/Hyperactivity Disorder (ADHD), Downs Syndrome, or Autism Spectrum Disorder (ASD). We are also interested in validating a model predicting parental distress for all parents, not just those who have children with physical or psychological conditions.

This study is being conducted by student researchers Eleanor Riewoldt and Georgia Hamilton as part of the requirements for the Honours Psychology Program at the University of Tasmania, under the supervision of Professor Kimberley Norris Associate Professor Nenagh Kemp.

Before deciding whether or not you would like to participate please read through the following information so that you have an understanding of the purpose of the study, what it will involve, and any risks and benefits of participating.

1. What is the purpose of this study?

The purpose of this study is to examine the factors that predict depression, anxiety and stress in the parents of children born preterm or with developmental disorders such as ADHD and ASD. Furthermore, we aim to provide validation for a model of general parental distress.

2. How is the study being funded?

This research is being funded through the research funds of the Chief and Associate Investigators. If you participate you may choose to enter the draw to receive one of six $25 gift vouchers.

3. Why have I been invited to participate?

You have been asked to participate because you either have a child aged between 4 years 0 months and 17 years 11 months. Your child may have been born preterm, have ADHD, ASD, Downs syndrome, or no diagnosed condition.

Your participation is voluntary, and your choice to take part or not take part will not affect any services you receive, or your child in any way.

4. What will I be asked to do?

Should you choose to participate in this study, you will be asked to complete a once-off online survey. This survey will contain questions asking about your mental health, your child's symptoms and behaviour, and your social and economic support, as well as some demographic information.

Responses will be multiple-choice style. We estimate that this survey will take between 45-60 minutes of your time to complete. You are able to save your responses and return at a later time if this is more convenient for you.

Your participation is entirely voluntary, and you may discontinue your participation at any time prior to the submission of the questionnaire by closing the browser you are using. As your data is non-identifiable, in that we don't ask for your name or other identifying information, once you have submitted your responses we cannot remove them as there is no way of identifying which data belong to you.

5. Are there any possible benefits from participation in this study?

This study gives parents the opportunity to discuss their mental health and the impact that their child's behaviour or disorder has on them. This study may therefore provide an opportunity for parents to have their voices heard and discuss issues in a confidential, and anonymous way.

This study may also give parents the opportunity to contribute to the scientific understanding of ADHD, ASD, preterm birth and Downs syndrome beyond the affected child's experience. This study may help explain parental distress, provide evidence for a model of parental distress, and may inform interventions to help prevent/treat parental distress in parents of children with these experiences as well as children not affected by any physical or psychological condition.

It is also possible that you may gain feelings of satisfaction from being able to contribute to a study that could have impacts on many families with a child born preterm or with ADHD, ASD or Downs syndrome.

6. Are there any possible risks from participation in this study?

This study involves answering questions about your mental health, and your child's disorder and behaviour, which could evoke some anxiety. If you feel any distress during the questionnaire we encourage you to immediately discontinue the study. If you wish to discuss these feelings with someone, you are welcome to contact Professor Kimberley Norris on the phone number or email address at the beginning of this document, or engage with other support services such as Lifeline (https://www.lifeline.org.au/; 13 11 14) or Beyond Blue (https://www.beyondblue.org.au/; 1300 22 4636). You may also wish to discuss these experiences with your GP, or another mental health care professional.

7. What if I change my mind during or after the study?

Participation in this study is entirely voluntary and you may withdraw at any point prior to the submission of the questionnaire. As your data is non-identifiable once you have submitted your responses we cannot remove them, as there is no way of identifying which information belongs to you.

8. What will happen to the data when this study is over?

Data will be non-identifiable. It will be stored on a University of Tasmania server for five years from the date of thesis completion. This server is password-protected and only accessible to the researchers of this study. Data will be destroyed at the end of the five years.

9. How will the results of the study be published?

Preliminary results will be available in December 2021. If you would like a copy of these results you can access these on the University of Tasmania Psychology website located at:

http://www.utas.edu.au/health/study/psychology. It is also anticipated that the researchers will publish this study in an academic journal.

If you would like to personally receive a summary of the results, please contact the researchers via the email address provided at the beginning of this information sheet.

10. What if I have questions about this study?

If you have any queries, concerns or issues with this study, please feel free to contact us:

- Student Researchers: Eleanor Riewoldt (er2@utas.edu.au) or Georgia Hamilton (gfh@utas.edu.au)

- Chief Investigator: Kimberley Norris (kimbeley.norris@utas.edu.au) or Nenagh Kemp (nenagh.kemp@utas.edu.au)

This study has been approved by the Tasmania Social Sciences Human Research Ethics Committee. If you have concerns or complaints about the conduct of this study, you can contact the Executive Officer of the HREC (Tasmania) Network on (03) 6226 2975 (SSHREC) or email ss.ethics@utas.edu.au. The Executive Officer is the person nominated to receive complaints from research participants. You will need to quote H0017272.

11. How can I agree to be involved?

Thank you for taking the time to consider participation in this study. Completing and submitting the questionnaire on the online survey will be taken as explicit consent to participate in this study.

Appendix C

Advertisement Flyer

UNIVERSITY of TASMANIA

ARE YOU A PARENT? DO YOU HAVE A CHILD AGED BETWEEN 5 AND 17?

How can you help?

Your participation in this survey could help us predict caregiver distress in caregivers of children with ASD or ADHD, which could inform treatment interventions.

We are looking for caregivers of children with ASD, ADHD, and caregivers of children with no diagnosed condition.

Interested?

- Scan the QR code on your phone or follow the link to complete the online survey
- The survey should take around 30-40 minutes to complete
- Participants also go in the draw to receive 1 of 6 Coles-Myer vouchers

https://tinyurl.com/26nkadbv

Student Researcher: Georgia Hamilton (gfh@utas.edu.au)
Ethics approval number: H0017272

Appendix D1

Demographic Questions About the Caregiver

Question:	Response options:
What is your year of birth?	Numerical response
What is the highest level of education you have completed?	Less than Year 12 or equivalent; Year 12 or equivalent; Vocational qualification; Undergraduate diploma; Bachelor degree; Postgraduate degree; Other
Including yourself, how many people live in your household?	Numerical response
How many children, under the age of 18, live in your household?	Numerical response
How many of your children have ASD?	Numerical response
How many of your children have ADHD?	Numerical response
Has the child for whom you will be reporting received a formal diagnosis of ASD by a health care provider (i.e. a physician, psychologist)?	Yes; No
Has the child for whom you will be reporting received a formal diagnosis of ADHD by a health care provider (i.e. a physician, psychologist)?	Yes; No
What is your current relationship status?	Married; De Facto relationship; Separated/Divorced; Single; Widowed; Other
What are your current living arrangements?	Married couple living together; Married couple living apart; De Facto couple living together; De Facto couple living apart; Single parent/caregiver; Other
Are you currently in paid employment?	Full time; Part time; Not employed
What is your total annual income, before taxes?	$0-19,999; $20-49,999; $50-79,999; $80-120,000; Over $120,000; Prefer not say

What is your total household income, before taxes?	$0-19,999; $20-49,999; $50-79,999; $80-120,000; Over $120,000; Prefer not say
Have you ever received a diagnosis of, or been treated for, any of the following:	Anxiety; Depression; Anorexia; Bulimia; Bipolar Disorder; Schizophrenia; Social Phobia; Asperger's Syndrome; Autism; Attention-Deficit/Hyperactivity Disorder; Other
Do you have any current diagnosed medical conditions for which you are receiving treatment?	Yes; No; No answer

Appendix D2

Demographic Questions About the Child

Question:	Response options:
How old is your child?	Years; Months
What sex is your child?	Female; Male; No answer
Is your child an oldest, middle, youngest, or only child?	Oldest; Middle; Youngest; Only
When at home, are you the primary caregiver for your child?	Yes; No
What is your relationship with your child?	Biological mother; Biological father; Step mother; Step father; Foster mother; Foster father; Other

Appendix E

Economic Support Questions

Item:	Response Options:
You have a special person who is willing and able to help you financially.	Strongly Disagree; Disagree; Neither Agree nor Disagree; Agree; Strongly Agree
You have some family or friends who are willing and able to help you financially.	Strongly Disagree; Disagree; Neither Agree nor Disagree; Agree; Strongly Agree

Appendix F1

Summary of Intercorrelations Between Variables in Caregivers of Typically Developing Children

Variable	1	2	3	4	5	6	7	8
1. Depression	-	-	-	-	-	-	-	-
2. Anxiety	.66***	-	-	-	-	-	-	-
3. Stress	.66***	.60***	-	-	-	-	-	-
4. Social Support	-.22	-.27*	-.20	-	-	-	-	-
5. Economic Support	-.14	-.25*	-.14	.72***	-	-	-	-
6. Limit Setting Ability	.31*	.24	.42***	-.03	-.02	-	-	-
7. Caregiver Locus of Control	.36**	.326**	.40***	-.16	-.06	.58***	-	-
8. Aggressive Behaviour	.24	.32**	.40**	-.08	-.05	.56***	.50***	-
9. Conduct Problems	.38**	.52***	.31*	-.14	-.16	.34**	.64***	.62***

Appendix F2

Summary of Inter-Correlations Between Variables in Caregivers of Children with ASD

Variable	1	2	3	4	5	6	7	8	9
1. Depression	-	-	-	-	-	-	-	-	-
2. Anxiety	.71***	-	-	-	-	-	-	-	-
3. Stress	.75***	.70***	-	-	-	-	-	-	-
4. Social Support	-.55***	-.39*	-.42**	-	-	-	-	-	-
5. Economic Support	-.30	-.23	-.24	.63***	-	-	-	-	-
6. Limit Setting Ability	.27	.27	.35*	-.08	-.12	-	-	-	-
7. Caregiver Locus of Control	.44**	.36*	.47**	-.15	-.13	.57***	-	-	-
8. Aggressive Behaviour	.30	.21	.31*	-.14	.03	.33*	.51***	-	-
9. Conduct Problems	.28	.22	.28	-.38*	-.37*	.30	.34*	.76***	-
10. ASD Severity	.25	.42**	.27	-.27	.09	.05	.23	.20	.03

Appendix F3

Summary of Inter-Correlations Between Variables in Caregivers of Children with ADHD

Variable	1	2	3	4	5	6	7	8	9
1. Depression	-	-	-	-	-	-	-	-	-
2. Anxiety	.68***	-	-	-	-	-	-	-	-
3. Stress	.72***	.68***	-	-	-	-	-	-	-
4. Social Support	-.25	-.19	-.30	-	-	-	-	-	-
5. Economic Support	-.14	-.06	-.32*	.65***	-	-	-	-	-
6. Limit Setting Ability	.24	.05	.31*	-.24	-.19	-	-	-	-
7. Caregiver Locus of Control	.53***	.41**	.41**	-.37*	-.35*	.35*	-	-	-
8. Aggressive Behaviour	.10	-.02	.11	-.30	-.40**	.26	.39**	-	-
9. Conduct Problems	.39*	.17	.19	-.12	-.20	.09	.39*	.58***	
10. ADHD Severity	.30*	.30	.32*	-.26	-.30*	.17	.48**	.70***	.76***

Appendix F4

Summary of Inter-Correlations Between Variables in Caregivers of Children with ASD and ADHD

Variable	1	2	3	4	5	6	7	8	9	10
1. Depression	-	-	-	-	-	-	-	-	-	-
2. Anxiety	.76***	-	-	-	-	-	-	-	-	-
3. Stress	.86***	.79***	-	-	-	-	-	-	-	-
4. Social Support	-.67***	-.58***	.64***	-	-	-	-	-	-	-
5. Economic Support	-.30*	-.21	-.21	.58***	-	-	-	-	-	-
6. Limit Setting Ability	.45***	.43**	.56***	-.22	-.14	-	-	-	-	-
7. Caregiver Locus of Control	.59***	.56***	.52***	-.47***	-.25	.44***	-	-	-	-
8. Aggressive Behaviour	.37**	.30*	.44***	-.23	-.06	.52***	.27*	-	-	-
9. Conduct Problems	.38**	.30*	.36*	-.34*	-.32*	.37**	.38**	.72***	-	-
10. ASD Severity	.53***	.52***	.51***	-.44***	-.32*	.42**	.16	.42**	.22	-
11. ADHD Severity	.46***	.37**	.48***	-.33*	-.20	.39**	.12	.71***	.58***	.46***

Appendix G1

Summary of Hierarchical Regression Analysis for Variables Predicting Depression in Caregivers of Typically Developing Children

Variable	B	SE	β	t	Adjusted R^2	ΔR^2	F
Model 1 (Step 1)					0.04	-	3.04
Social Support	-0.12	0.07	-0.23	-1.74			
Model 2 (Step 2)					0.15	0.13	5.83*
Social Support	-0.08	0.07	-0.14	-1.11			
PLOC	0.46	0.16	0.37	2.87*			
Model 3 (Step 3)					0.14	0.00	3.92*
Social Support	-0.08	0.07	-0.14	-1.09			
PLOC	-.43	0.18	0.34	2.41*			
Aggressive Behaviour	0.12	0.23	0.07	0.52			
Model 4 (Step 4)					0.14	0.02	3.32*
Social Support	-0.08	0.07	-0.14	-1.13			
PLOC	0.29	0.21	0.23	1.41			
Aggressive Behaviour	-0.04	0.26	-0.02	-0.15			
Conduct Problems	0.59	0.50	0.22	1.19			
Model 5 (Step 5)					0.17	0.04	3.27*
Social Support	-0.08	0.07	-0.15	-1.2			
PLOC	0.18	0.22	0.14	0.84			
Aggressive Behaviour	-0.20	0.28	-0.12	-0.73			
Conduct Problems	0.69	0.50	0.26	1.39			
Limit Setting Ability	-.76	0.46	0.24	1.63			
Model 6 (Step 6)					0.15	0.00	2.69*

	B	SE	β	
Social Support	-0.11	0.11	-0.20	-0.99
PLOC	0.16	0.23	0.12	0.68
Aggressive Behaviour	-0.23	0.29	-0.14	-0.79
Conduct Problems	0.75	0.54	0.28	1.39
Limit Setting Ability	0.77	0.47	0.24	1.64
Economic Support	0.24	0.75	0.07	0.32

Note. * = $p < .05$

B = Unstandardized Regression Coefficient

SE = Standard Error of Unstandardized Regression Coefficient

β = Standardized Coefficient

PLOC = parental locus of control

Appendix G2

Summary of Hierarchical Regression Analysis for Variables Predicting Depression in Caregivers of Children with ASD

Variable	B	SE	β	t	Adjusted R^2	ΔR^2	F
Model 1 (Step 1)					0.02	-	1.63
ASD Severity	0.29	0.23	0.21	1.28			
Model 2 (Step 2)					0.26	0.26	7.43*
ASD Severity	0.12	0.20	0.08	0.57			
Social Support	-0.30	0.08	-0.52	-3.57*			
Model 3 (Step 3)					0.36	0.12	8.95*
ASD Severity	0.03	0.19	0.02	0.14			
Social Support	-0.28	00.08	-0.49	-3.62*			
PLOC	0.39	0.15	0.35	2.61*			
Model 4 (Step 4)					0.35	0.00	5.87*
ASD Severity	0.03	0.19	0.02	0.13			
Social Support	-0.28	0.08	-0.49	-3.56*			
PLOC	0.38	0.17	0.34	2.20*			
Aggressive Behaviour	0.03	0.20	0.02	0.14			
Model 5 (Step 5)					0.33	0.01	4.66*
ASD Severity	-0.01	0.20	0.00	-0.03			
Social Support	-0.31	0.09	-0.54	-3.31*			
PLOC	0.37	0.17	0.44	2.12*			
Aggressive Behaviour	0.17	0.33	0.13	0.53			
Conduct Problems	-0.53	0.92	-0.14	-0.58			
Model 6 (Step 6)					0.31	0.00	3.78*

	B	SE	β				
ASD Severity	0.00	0.21	0.00	-0.01			
Social Support	-0.31	0.09	-0.54	-3.27*			
PLOC	0.34	0.21	0.31	1.63			
Aggressive Behaviour	0.18	0.33	0.13	0.54			
Conduct Problems	-0.56	0.95	-0.15	-0.59			
Limit Setting Ability	0.12	0.54	0.04	0.22			
Model 7 (Step 7)					0.29	0.00	3.16*
ASD Severity	-0.02	0.22	-0.01	-0.10			
Social Support	-0.33	0.12	-0.58	-2.83*			
PLOC	0.36	0.22	0.33	1.64			
Aggressive Behaviour	-.13	0.37	0.10	0.35			
Conduct Problems	-0.43	1.03	-0.11	-0.41			
Limit Setting Ability	0.12	0.54	0.04	0.22			
Economic Support	0.28	0.80	0.07	0.34			

Note. * = $p < .05$

B = Unstandardized Regression Coefficient

SE = Standard Error of Unstandardized Regression Coefficient

$β$ = Standardized Coefficient

PLOC = parental locus of control

Appendix G3

**Summary of Hierarchical Regression Analysis for Variables Predicting Depression in
Caregivers of Children with ADHD**

Variable	B	SE	β	t	Adjusted R^2	ΔR^2	F
Model 1 (Step 1)					.10	-	5.55*
ADHD Severity	0.26	0.11	0.36	2.36*			
Model 2 (Step 2)					.10	.02	3.22*
ASD Severity	0.23	0.12	0.31	1.99			
Social Support	-0.09	0.09	-0.15	-0.96			
Model 3 (Step 3)					.29	.19	6.24*
ADHD Severity	0.05	0.12	0.06	0.39			
Social Support	-0.04	0.09	-0.07	-0.49			
PLOC	0.64	0.20	0.53	3.26*			
Model 4 (Step 4)					.33	.06	5.76*
ADHD Severity	0.23	0.16	0.31	1.49			
Social Support	-0.06	0.08	-0.10	-0.73			
PLOC	0.61	0.19	0.50	3.20*			
Aggressive Behaviour	-0.50	0.28	-0.34	-1.78			
Model 5 (Step 5)					.36	.05	5.40*
ADHD Severity	0.06	0.18	0.08	0.30			
Social Support	-0.08	0.08	-0.14	-1.00			
PLOC	0.60	0.19	0.50	3.23*			
Aggressive Behaviour	-0.54	0.27	-0.37	-1.98			
Conduct Problems	0.78	0.47	0.33	1.70			
Model 6 (Step 6)					.35	.00	4.45*

	B	SE	β				
ADHD Severity	0.05	0.19	0.07	0.29			
Social Support	-0.08	0.08	-0.13	-0.95			
PLOC	0.58	0.19	0.48	3.05*			
Aggressive Behaviour	-0.55	0.28	-0.38	-2.00			
Conduct Problems	0.80	0.48	0.34	1.68			
Limit Setting Ability	0.23	0.51	0.61	0.51			
Model 7 (Step 7)					.33	.00	3.71*
ADHD Severity	0.05	0.19	0.07	0.27			
Social Support	-0.09	0.10	-0.16	-0.90			
PLOC	0.59	0.19	0.48	3.02*			
Aggressive Behaviour	-0.54	0.30	-0.37	-1.86			
Conduct Problems	0.80	0.48	0.34	1.66			
Limit Setting Ability	0.23	0.45	0.07	0.51			
Economic Support	0.16	0.68	0.04	0.23			

Note. * = $p < .05$

B = Unstandardized Regression Coefficient

SE = Standard Error of Unstandardized Regression Coefficient

$β$ = Standardized Coefficient

PLOC = parental locus of control

Appendix G4

Summary of Hierarchical Regression Analysis for Variables Predicting Depression in Caregivers of Children with ASD and ADHD

Variable	B	SE	β	t	Adjusted R^2	ΔR^2	F
Model 1 (Step 1)					0.34	-	13.36*
ASD Severity	0.78	0.24	0.42	3.21*			
ADHD Severity	0.25	0.11	0.28	2.16*			
Model 2 (Step 2)					0.53	0.19	18.86*
ASD Severity	0.40	0.22	0.22	1.80			
ADHD Severity	0.17	0.10	0.20	1.77			
Social Support	-0.39	0.09	-0.50	-4.39*			
Model 3 (Step 3)					0.64	0.12	21.85*
ASD Severity	0.46	0.20	0.25	2.33*			
ASD Severity	0.19	0.09	0.21	2.15*			
Social Support	-0.24	0.09	-0.31	-2.68*			
PLOC	0.59	0.16	0.38	3.77*			
Model 4 (Step 4)					0.63	0.00	17.12*
ASD Severity	0.46	0.20	0.25	2.32*			
ASD Severity	0.21	0.12	0.24	1.76			
Social Support	-0.23	0.09	-0.30	-2.61*			
PLOC	0.60	0.17	0.39	3.63*			
Aggressive Behaviour	-0.06	0.21	-0.04	-0.27			
Model 5 (Step 5)					0.62	0.00	14.16*
ASD Severity	0.44	0.21	0.24	2.12*			
ASD Severity	0.22	0.12	0.26	1.84			

	B	SE	β	t	R	ΔR²	F
Social Support	-0.24	0.09	-0.31	-2.65*			
PLOC	0.62	0.17	0.40	3.66*			
Aggressive Behaviour	0.03	0.25	0.02	0.11			
Conduct Problems	-0.34	0.50	-0.09	-0.67			
Model 6 (Step 6)					0.62	0.00	11.95*
ASD Severity	0.41	0.22	0.22	1.84			
ASD Severity	0.22	0.12	0.25	1.81			
Social Support	-0.25	0.09	-0.32	-2.66*			
PLOC	0.59	0.19	0.38	3.10*			
Aggressive Behaviour	-0.01	0.26	-0.01	-0.05			
Conduct Problems	-0.31	0.51	-0.09	-0.61			
Limit Setting Ability	0.20	0.42	0.06	0.48			
Model 7 (Step 7)					0.63	0.02	11.30*
ASD Severity	0.46	0.22	0.25	2.16*			
ASD Severity	0.22	0.12	0.26	1.88			
Social Support	-0.33	0.10	-0.42	-3.19*			
PLOC	0.56	0.19	0.36	3.03*			
Aggressive Behaviour	-0.13	0.27	-0.08	-0.47			
Conduct Problems	-0.05	0.52	-0.01	-0.10			
Limit Setting Ability	0.24	0.41	0.07	0.58			
Economic Support	1.01	0.60	0.19	1.70			

Note. * = $p < .05$

B = Unstandardized Regression Coefficient

SE = Standard Error of Unstandardized Regression Coefficient

$β$ = Standardized Coefficient

PLOC = parental locus of control

Appendix G5

Summary of Hierarchical Regression Analysis for Variables Predicting Anxiety in Caregivers of Typically Developing Children

Variable	B	SE	β	t	Adjusted R^2	ΔR^2	F
Model 1 (Step 1)					0.06	-	4.61*
Social Support	-0.12	0.05	-0.28	-2.15*			
Model 2 (Step 2)					0.17	0.12	6.78*
Social Support	-0.08	0.05	-0.91	-1.53			
PLOC	0.35	0.12	0.36	2.89*			
Model 3 (Step 3)					0.19	0.04	5.47*
Social Support	-0.08	0.05	-0.19	-1.50			
PLOC	0.27	0.13	0.28	2.07			
Aggressive Behaviour	0.26	0.17	0.21	1.56			
Model 4 (Step 4)					0.27	0.85	6.15
Social Support	-0.08	0.05	-0.20	-1.66			
PLOC	0.07	0.15	0.07	0.47			
Aggressive Behaviour	0.02	0.18	0.02	0.13			
Conduct Problems	0.90	0.35	0.44	2.55			
Model 5 (Step 5)					0.26	0.01	5.02
Social Support	-0.08	0.05	-0.20	-0.17			
PLOC	0.03	0.16	0.03	0.19			
Aggressive Behaviour	-0.04	0.20	-0.03	-0.18			
Conduct Problems	0.93	0.36	0.46	2.62*			
Limit Setting Ability	0.27	0.33	0.11	0.82			
Model 6 (Step 6)					0.26	0.01	4.23*

	B	SE	β	t
Social Support	-0.13	0.08	-0.31	-1.58
PLOC	-0.01	0.17	-0.01	-0.05
Aggressive Behaviour	-0.08	0.21	-0.07	-0.39
Conduct Problems	1.03	0.39	0.51	2.68*
Limit Setting Ability	0.29	0.33	0.12	0.88
Economic Support	0.38	0.54	0.14	0.70

Note. * = $p < .05$

B = Unstandardized Regression Coefficient

SE = Standard Error of Unstandardized Regression Coefficient

β = Standardized Coefficient

PLOC = parental locus of control

Appendix G6

Summary of Hierarchical Regression Analysis for Variables Predicting Anxiety in Caregivers of Children with ASD

Variable	B	SE	β	t	Adjusted R^2	ΔR^2	F
Model 1 (Step 1)					0.16	-	7.77*
ASD Severity	0.43	0.15	0.42	2.79*			
Model 2 (Step 2)					0.22	0.08	6.08*
ASD Severity	0.34	0.15	0.35	2.34*			
Social Support	-0.12	0.06	-0.29	-1.95			
Model 3 (Step 3)					0.26	0.06	5.36*
ASD Severity	0.31	0.15	0.30	2.05*			
Social Support	-0.11	0.06	-0.27	-1.85			
PLOC	0.21	0.12	0.26	1.78			
Model 4 (Step 4)					0.24	0.00	3.91*
ASD Severity	0.311	0.15	0.31	2.03			
Social Support	-0.11	0.06	-0.27	-1.8			
PLOC	0.22	0.14	0.27	1.61			
Aggressive Behaviour	-0.02	0.16	-0.02	-0.13			
Model 5 (Step 5)					0.22	0.02	3.07*
ASD Severity	0.33	0.16	0.32	2.02			
Social Support	-0.10	0.07	-0.24	-1.37			
PLOC	0.22	0.14	0.27	1.61			
Aggressive Behaviour	-0.09	0.26	-0.09	-0.34			
Conduct Problems	0.25	0.74	0.09	0.34			
Model 6 (Step 6)					0.20	0.00	2.51*

	B	SE	β	t			
ASD Severity	0.33	0.16	0.32	2.01			
Social Support	-0.10	0.08	-0.25	-1.38			
PLOC	1.88	0.17	0.23	1.13			
Aggressive Behaviour	-0.08	0.26	-0.08	-0.31			
Conduct Problems	0.21	0.75	-.08	0.28			
Limit Setting Ability	0.16	0.43	0.07	0.37			
Model 7 (Step 7)					0.17	0.00	2.10
ASD Severity	0.34	0.17	0.33	1.98			
Social Support	-0.09	0.09	-0.21	-0.96			
PLOC	0.18	0.17	0.22	1.03			
Aggressive Behaviour	-0.05	0.29	-0.05	-0.18			
Conduct Problems	0.13	0.83	0.05	0.16			
Limit Setting Ability	0.16	0.43	0.68	0.36			
Economic Support	0.17	0.64	-0.06	-0.26			

Note. * = $p < .05$

B = Unstandardized Regression Coefficient

SE = Standard Error of Unstandardized Regression Coefficient

$β$ = Standardized Coefficient

PLOC = parental locus of control

Appendix G7

Summary of Hierarchical Regression Analysis for Variables Predicting Anxiety in Caregivers of Children with ADHD

Variable	B	SE	β	t	Adjusted R^2	ΔR^2	F
Model 1 (Step 1)					0.06	-	3.45
ADHD Severity	0.13	0.07	0.29	1.89			
Model 2 (Step 2)					0.06	0.02	2.14
ADHD Severity	0.11	0.07	0.25	1.52			
Social Support	-0.05	0.06	-0.15	-0.92			
Model 3 (Step 3)					0.18	0.14	3.85*
ADHD Severity	0.02	0.08	0.03	0.19			
Social Support	-0.03	0.06	-0.08	-0.52			
PLOC	0.33	0.13	0.45	2.57			
Model 4 (Step 4)					0.26	0.09	4.36*
ADHD Severity	0.16	0.10	0.35	1.60			
Social Support	-0.05	0.05	-0.12	-0.83			
PLOC	0.31	0.12	0.42	2.52*			
Aggressive Behaviour	-0.39	0.18	-0.44	-2.17*			
Model 5 (Step 5)					0.24	0.00	3.41*
ADHD Severity	0.18	0.12	0.39	1.42			
Social Support	-0.04	0.06	-0.12	-0.77			
PLOC	0.31	0.12	0.42	2.49*			
Aggressive Behaviour	-0.39	0.18	-0.43	-2.11*			
Conduct Problems	-0.07	0.31	-0.05	-0.23			
Model 6 (Step 6)					0.21	0.00	2.77*

	B	SE	β	t			
ADHD Severity	0.18	0.13	-.39	1.41			
Social Support	-0.04	0.06	-0.12	-0.78			
PLOC	0.32	0.13	0.43	2.47*			
Aggressive Behaviour	-0.38	0.19	-0.43	-2.06*			
Conduct Problems	-0.08	0.32	-0.05	-0.24			
Limit Setting Ability	-0.08	0.30	-0.04	-0.27			
Model 7 (Step 7)					0.20	0.01	2.37*
ADHD Severity	0.17	0.13	0.38	1.37			
Social Support	-0.07	0.07	-0.18	-0.95			
PLOC	0.32	0.13	0.44	2.48*			
Aggressive Behaviour	-0.36	0.19	-0.40	-1.85			
Conduct Problems	-0.08	0.32	-0.05	-0.24			
Limit Setting Ability	-0.08	0.30	-0.04	-0.25			
Economic Support	0.25	0.46	0.12	-.55			

Note. * = $p < .05$

B = Unstandardized Regression Coefficient

SE = Standard Error of Unstandardized Regression Coefficient

β = Standardized Coefficient

PLOC = parental locus of control

Appendix G8

Summary of Hierarchical Regression Analysis for Variables Predicting Anxiety in Caregivers of Children with ASD and ADHD

Variable	B	SE	β	t	Adjusted R^2	ΔR^2	F
Model 1 (Step 1)					0.31	-	11.64*
ASD Severity	0.68	0.18	0.50	3.71*			
ADHD Severity	0.09	0.09	0.15	1.08			
Model 2 (Step 2)					0.42	0.12	12.64*
ASD Severity	0.46	0.18	0.34	2.51*			
ADHD Severity	0.05	0.08	0.08	0.62			
Social Support	-0.23	0.07	-0.40	-3.17			
Model 3 (Step 3)					0.53	0.11	14.50*
ASD Severity	0.50	0.16	0.37	0.03*			
ASD Severity	0.06	0.07	0.09	0.82			
Social Support	-0.11	0.07	-0.20	-1.56			
PLOC	0.44	0.13	0.38	3.37*			
Model 4 (Step 4)					0.53	0.01	11.63*
ASD Severity	0.51	0.17	0.38	3.09*			
ASD Severity	0.11	0.10	0.17	1.13			
Social Support	-0.12	0.07	-0.19	-1.45			
PLOC	0.47	0.14	0.41	3.45*			
Aggressive Behaviour	-0.14	0.18	-0.12	-0.79			
Model 5 (Step 5)					0.51	0.00	9.51*
ASD Severity	0.50	0.17	0.37	2.93*			
ASD Severity	0.12	0.10	0.18	1.16			

	B	SE	β	t			
Social Support	-0.11	0.08	-0.20	-1.47			
PLOC	0.48	0.14	0.42	3.39*			
Aggressive Behaviour	-0.12	0.21	-0.09	-0.51			
Conduct Problems	-0.14	0.42	-0.05	-0.32			
Model 6 (Step 6)					0.51	0.01	8.20*
ASD Severity	0.46	0.18	0.34	2.55*			
ASD Severity	0.11	0.10	0.18	1.13			
Social Support	-0.13	0.08	-0.22	-1.61			
PLOC	0.43	0.16	0.37	2.72*			
Aggressive Behaviour	-0.17	0.22	-0.14	-0.76			
Conduct Problems	-0.10	0.42	-0.04	-0.24			
Limit Setting Ability	0.30	0.35	0.12	0.85			
Model 7 (Step 7)					0.55	0.04	8.26*
ASD Severity	0.51	0.18	0.38	2.94*			
ASD Severity	0.12	0.10	0.18	1.20			
Social Support	-0.20	0.08	-0.35	-2.40*			
PLOC	0.40	0.15	0.35	2.66*			
Aggressive Behaviour	-0.28	0.22	-0.24	-1.27			
Conduct Problems	0.16	0.43	0.06	0.37			
Limit Setting Ability	0.33	0.34	0.13	0.99			
Economic Support	1.00	0.49	0.26	2.06			

Note. * = $p < .05$

B = Unstandardized Regression Coefficient

SE = Standard Error of Unstandardized Regression Coefficient

β = Standardized Coefficient

PLOC = parental locus of control

Appendix G9

Summary of Hierarchical Regression Analysis for Variables Predicting Stress in Caregivers of Typically Developing Children

Variable	B	SE	β	t	Adjusted R^2	ΔR^2	F
Model 1 (Step 1)					0.25	-	2.46
Social Support	-0.10	0.06	-0.21	-1.57			
Model 2 (Step 2)					0.09	0.08	3.77*
Social Support	-0.06	0.06	-0.14	-1.05			
PLOC	0.32	0.14	0.29	2.21			
Model 3 (Step 3)					0.13	0.05	3.73*
Social Support	-0.06	0.06	-0.13	-0.10			
PLOC	0.21	0.15	.19	1.35			
Aggressive Behaviour	0.35	0.19	0.25	1.82			
Model 4 (Step 4)					0.11	0.00	2.76*
Social Support	-0.06	0.06	-0.13	-1.02			
PLOC	0.19	0.18	0.17	1.02			
Aggressive Behaviour	0.33	0.23	0.23	1.45			
Conduct Problems	0.09	0.44	0.04	0.21			
Model 5 (Step 5)					0.13	0.03	2.67*
Social Support	-0.06	0.06	-0.14	-1.07			
PLOC	0.100	0.19	0.09	0.52			
Aggressive Behaviour	0.20	0.24	0.14	0.85			
Conduct Problems	0.16	0.43	0.07	0.38			
Limit Setting Ability	0.59	0.41	0.22	1.45			
Model 6 (Step 6)					0.11	0.00	2.19

	B	SE	β	
Social Support	-0.06	0.10	-0.12	-0.67
PLOC	0.11	0.20	0.10	0.52
Aggressive Behaviour	0.21	0.26	0.15	0.83
Conduct Problems	0.15	0.47	0.06	0.31
Limit Setting Ability	0.5	0.41	0.22	1.42
Economic Support	-0.07	0.66	-0.02	-0.11

Note. * = $p < .05$

B = Unstandardized Regression Coefficient

SE = Standard Error of Unstandardized Regression Coefficient

β = Standardized Coefficient

PLOC = parental locus of control

Appendix G10

Summary of Hierarchical Regression Analysis for Variables Predicting Stress in Caregivers of Children with ASD

Variable	B	SE	β	t	Adjusted R^2	ΔR^2	F
Model 1 (Step 1)					0.00	-	1.21
ASD Severity	0.17	0.15	0.18	1.10			
Model 2 (Step 2)					0.12	0.12	3.24
ASD Severity	0.09	0.15	0.09	0.58			
Social Support	-0.14	0.06	-0.36	-2.26*			
Model 3 (Step 3)					0.25	0.15	5.09*
ASD Severity	0.02	0.14	0.02	0.13			
Social Support	-0.13	0.06	-0.33	-2.23*			
PLOC	0.30	0.12	0.40	2.75*			
Model 4 (Step 4)					0.23	0.00	3.73*
ASD Severity	0.02	0.14	0.02	0.14			
Social Support	-0.13	0.06	-0.33	-2.21*			
PLOC	0.32	0.13	0.42	2.51*			
Aggressive Behaviour	-0.04	0.15	-0.04	-0.26			
Model 5 (Step 5)					0.21	0.01	2.96*
ASD Severity	0.04	0.15	0.04	0.25			
Social Support	-0.11	0.07	-0.29	-1.63			
PLOC	0.32	0.13	0.43	2.51*			
Aggressive Behaviour	-0.12	0.24	-0.14	-0.51			
Conduct Problems	0.31	0.68	0.12	0.46			
Model 6 (Step 6)					0.21	0.02	2.61*

	B	SE	β	t			
ASD Severity	0.05	0.15	0.05	0.31			
Social Support	-0.12	0.07	-0.30	-1.71			
PLOC	0.24	0.15	0.32	1.57			
Aggressive Behaviour	-0.11	0.24	-0.12	-0.45			
Conduct Problems	0.22	0.69	0.09	0.32			
Limit Setting Ability	0.37	0.39	0.18	0.96			
Model 7 (Step 7)					0.18	0.00	2.17
ASD Severity	0.05	0.16	0.06	0.34			
Social Support	-0.12	0.09	-0.28	-1.26			
PLOC	0.23	0.16	0.31	1.47			
Aggressive Behaviour	-0.09	0.27	-0.10	-0.33			
Conduct Problems	0.16	0.75	0.06	0.22			
Limit Setting Ability	0.37	0.40	0.18	0.94			
Economic Support	-0.11	0.58	-0.04	-0.19			

Note. * = $p < .05$

B = Unstandardized Regression Coefficient

SE = Standard Error of Unstandardized Regression Coefficient

β = Standardized Coefficient

PLOC = parental locus of control

Appendix G11

Summary of Hierarchical Regression Analysis for Variables Predicting Stress in Caregivers of Children with ADHD

Variable	B	SE	β	t	Adjusted R^2	ΔR^2	F
Model 1 (Step 1)					0.11	-	5.57*
ADHD Severity	0.21	0.09	0.36	2.36*			
Model 2 (Step 2)					0.14	0.06	4.13*
ADHD Severity	0.17	0.09	0.29	1.86			
Social Support	-0.11	0.07	-0.24	-1.57			
Model 3 (Step 3)					0.21	0.09	4.47*
ADHD Severity	0.07	0.10	0.12	0.70			
Social Support	-0.09	0.07	-0.19	-1.25			
PLOC	0.33	0.16	0.26	2.09*			
Model 4 (Step 4)					0.24	0.05	4.13*
ADHD Severity	0.20	0.13	0.35	1.59			
Social Support	-0.10	0.07	-0.22	-48			
PLOC	0.32	0.16	0.33	2.00*			
Aggressive Behaviour	-0.37	0.23	-0.32	-1.59			
Model 5 (Step 5)					0.23	0.01	3.29*
ADHD Severity	0.25	0.16	0.44	1.61			
Social Support	-0.10	0.07	-0.21	-1.36			
PLOC	0.32	0.16	0.34	2.00*			
Aggressive Behaviour	-0.35	0.23	-0.31	-1.52			
Conduct Problems	-0.22	0.40	-0.12	-0.55			
Model 6 (Step 6)					024	0.03	3.10*

	B	SE	β				
ADHD Severity	0.35	0.16	0.43	1.59			
Social Support	-0.09	0.07	-0.19	-1.28			
PLOC	0.28	0.16	0.30	1.75			
Aggressive Behaviour	-0.38	0.23	-0.33	-1.63			
Conduct Problems	-0.19	0.40	-0.10	-0.46			
Limit Setting Ability	0.49	0.37	0.19	1.33			
Model 7 (Step 7)					0.25	0.02	2.86*
ADHD Severity	0.26	0.16	0.44	1.65			
Social Support	-0.03	0.09	-0.07	-0.39			
PLOC	0.26	0.16	0.28	1.65			
Aggressive Behaviour	-0.44	0.24	-0.39	-1.85			
Conduct Problems	-0.18	0.40	-0.10	-0.47			
Limit Setting Ability	0.48	0.37	0.19	1.30			
Economic Support	-0.63	0.56	-0.21	-1.13			

Note. $* = p < .05$

B = Unstandardized Regression Coefficient

SE = Standard Error of Unstandardized Regression Coefficient

$β$ = Standardized Coefficient

PLOC = parental locus of control

Appendix G12

Summary of Hierarchical Regression Analysis for Variables Predicting Stress in Caregivers of Children with ASD and ADHD

Variable	B	SE	β	t	Adjusted R^2	ΔR^2	F
Model 1 (Step 1)					0.33	-	12.7*
ASD Severity	0.54	0.18	0.39	2.95*			
ADHD Severity	0.20	0.09	0.31	2.31*			
Model 2 (Step 2)					0.48	0.16	15.82*
ASD Severity	0.28	0.18	0.21	1.62			
ADHD Severity	0.15	0.08	0.23	1.94			
Social Support	-0.27	0.07	-0.46	-3.82*			
Model 3 (Step 3)					0.54	0.07	15.21*
ASD Severity	0.32	0.17	0.23	1.92			
ASD Severity	0.16	0.07	0.24	2.16*			
Social Support	-0.18	0.07	-0.30	-2.38*			
PLOC	0.25	0.13	0.30	2.65*			
Model 4 (Step 4)					0.54	0.01	12.24*
ASD Severity	0.30	0.17	0.22	1.80			
ASD Severity	0.10	0.10	0.26	1.03			
Social Support	-0.18	0.08	-0.32	-2.45*			
PLOC	0.31	0.14	0.27	2.24*			
Aggressive Behaviour	0.15	0.18	0.13	0.86			
Model 5 (Step 5)					0.54	0.01	10.55*
ASD Severity	0.26	0.17	0.19	1.53			
ASD Severity	0.12	0.10	0.19	1.25			

	B	SE	β	t			
Social Support	-0.19	0.08	-0.22	-2.58*			
PLOC	0.35	0.14	0.30	2.46*			
Aggressive Behaviour	0.28	0.20	0.23	1.35			
Conduct Problems	-0.50	0.41	-0.18	-1.2			
Model 6 (Step 6)					0.58	0.04	10.49*
ASD Severity	0.15	0.17	0.11	0.90			
ASD Severity	0.12	0.10	0.18	1.23			
Social Support	-0.23	0.07	-0.39	-3.10*			
PLOC	0.21	0.15	0.18	1.44			
Aggressive Behaviour	0.13	0.21	0.11	0.63			
Conduct Problems	-0.41	0.40	-0.15	-1.03			
Limit Setting Ability	0.71	0.33	0.28	2.15			
Model 7 (Step 7)					0.62	0.04	10.91*
ASD Severity	0.21	0.16	0.15	1.32			
ASD Severity	0.12	0.09	0.18	1.33			
Social Support	-0.31	0.08	-0.53	-4.00*			
PLOC	0.19	0.14	0.16	1.33			
Aggressive Behaviour	0.01	0.20	0.01	0.06			
Conduct Problems	-0.13	0.40	-0.49	-0.34			
Limit Setting Ability	0.75	0.31	0.29	2.40*			
Economic Support	1.07	0.45	0.27	2.37*			

Note. * = $p < .05$

B = Unstandardized Regression Coefficient

SE = Standard Error of Unstandardized Regression Coefficient

β = Standardized Coefficient

PLOC = parental locus of control