

Testing a Model to Predict Depression, Anxiety and Stress in Parents of Children  
with Attention-Deficit/Hyperactivity Disorder

Sarah L Scott

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## **Statement of Sources**

I declare that this report is my own original work and that the contribution of others has been  
duly acknowledged.

Signature:

Date: 17/10/2018

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Sarah L Scott

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### **Abstract**

Parents of children with ADHD experience levels of distress that negatively impact child, parent, and family functioning. However, current treatment approaches for ADHD focus on child interventions and disregard the effect of parental distress. Falk et al. (2014) developed Model A, further validated by Bones (2017), to demonstrate that the relationship between parental distress and child-centric variables (child social/interpersonal deficits and externalising behaviour) is mediated by parent-centric variables (socio-economic support and maladaptive parental cognitions) in ASD populations. The current study aimed to validate Model A in an ADHD population. This study recruited 142 parents of children aged 4 to 17 years old, with and without ADHD. Participants completed an online survey including measures of socio-economic support, maladaptive parental cognitions, child social/interpersonal deficits, and child externalising behaviour. Hierarchical regression was conducted and results indicated that parents of children with ADHD had significantly higher levels of distress compared to parents of typically developing children and that the variables in Model A were significant predictors of parental distress. Results suggest that parent-centric factors, particularly maladaptive parental cognitions, are important predictors of distress in ADHD parents. This study illustrates a need to focus on interventions that target parental distress when treating children with ADHD.

Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder that affects personal, social, academic and/or occupational functioning and is characterised by inattention, hyperactivity, and impulsivity (Goulardins, Marques & De Oliveira, 2017). ADHD is the most common neuropsychiatric disorder in childhood, affecting 7.5% of children in Australia (Graetz, Sawyer, Hazell, Arney & Baghurst, 2001). While there is no cure for ADHD, medications exist to help manage symptoms and provide a sense of calm in affected individuals (Fleming et al., 2017). Behavioural interventions are also used as stand-alone treatments or in conjunction with medication (Dodangi, Vameghi & Habibi, 2017). Raising a child with ADHD can be challenging for parents and may increase parental stress and incidence of mental illness (Sundarall, der Westhuizen & Fletcher, 2016); nonetheless, the stressful impact of raising a child with ADHD is only beginning to be explored (Podolski & Nigg, 2001).

Behavioural problems, a long diagnostic process, difficulty obtaining the educational resources required for the child, along with judgement and lack of acceptance from a society that stigmatizes abnormal behaviour are some challenges that parents of children with ADHD may face (Cheesman, 2011). Children with ADHD may be less compliant with parental requests and more demanding than typically developing children, and the defiant behaviour of children with ADHD is a potent contributor to parenting stress (Narkunam, Hashim, Sachdev, Pillai & Ng, 2012). Limited research attention has focused on parenting stress levels in families of children diagnosed with ADHD and the extent of resources and support these parents require (Cheesman, 2011). Understanding parental mental health is a vital aspect of providing effective support to improve the wellbeing and social functioning of children with ADHD and to encourage healthy mental wellbeing for parents (Lesesne, Visser & White, 2003).

To date, very few studies have used population data to examine the association between

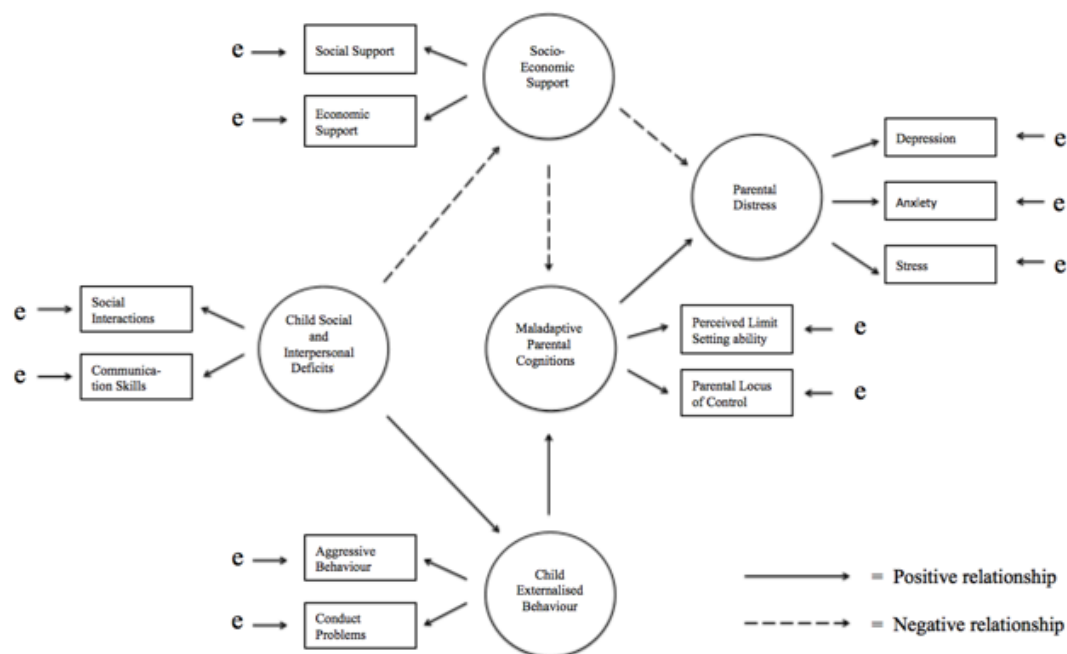
both maternal and paternal mental health and child ADHD symptoms. Previous researchers have found that compared to parents of typically developing children, parents of children with ADHD are more likely to be diagnosed with depression and anxiety (Ray, Croen & Habel, 2009), and report a reduced capacity to effectively parent their child (Tarver, Daley & Sayal, 2014). One study found that mothers of children with ADHD may be four times more likely than mothers of typically developing children to develop a chronic mental health condition as a result of the stress of caring for a child with ADHD (Lesesne et al., 2003). An additional study in South Africa found a strong positive association between poor child mental health and parental mental health outcomes, with the researchers advocating a pressing need for early identification of potential at-risk parents to avoid future behavioural and emotional difficulties for the parent and child (Sundarall et al., 2016). These research findings indicate a demand for greater understanding and increased emotional and psychological support for parents of children with ADHD.

Previous researchers have called for further investigation of the resources (financial, physical and social) available to parents of children with disabilities to determine if the availability of such resources plays a mediating role in parental stress (Cheesman, 2011). In addition, data from a broad range of clinical populations and age groups has been suggested (Kadesjo, Stenlund, Gilbert & Hagglof, 2002). In response to this void, Falk, Norris and Quinn (2014) studied mothers and fathers of children with Autism Spectrum Disorder (ASD) and created Model A, which demonstrated that the relationship between ASD symptom severity and child externalising behaviours was mediated by maladaptive parental cognitions, and socio-economic support. The model was investigated further by Bones (2017) who compared parents of children with ASD to parents of children without ASD. Bones wanted to determine whether

Falk et al.'s original model could predict parental distress specifically relating to ASD, or if it could predict distress in general parent populations. The research found that the model did in fact hold for parents of children without ASD. However, due to insufficient sample size, the model could not be tested for invariance between these populations and future research was suggested to determine the validity of the model on other populations.

The current study aimed to expand on the ASD findings of Falk et al. (2014) and Bones (2017) by testing the model in a new sample population: parents raising children with ADHD. Model A contains the following five factors: parental distress (evaluating depression, anxiety and stress), child externalising behaviour (evaluating aggressive behaviour and conduct problems), child social and interpersonal deficits (evaluating ADHD severity), socio-economic support (evaluating social support and economic support), and maladaptive parental cognitions (evaluating limit setting ability and parental locus of control).

Figure 1. *Model A*



Note: e = error variance. Circles represent latent variables (factors); rectangles represent observed variables.

From “Empirical Validation of a Model Predicting Depression, Anxiety, and Stress in the Parents of Children with Autism” by S. Bones, 2017 (Unpublished Honours Thesis).  
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## **Parental Distress**

In this study, parental depression, anxiety and stress were collectively labelled as “parental distress”. Depression indicates a negative mood state characterised by feelings of sadness, hopelessness, irritation, and loss of interest and/or pleasure (Angst & Dobler-Mikola, 1984). Mothers of children with ADHD have been found three times more likely than mothers of children without ADHD to experience depressive symptoms (O’Brien, Sauber, Merson & Chronis-Tuscano, 2017). Anxiety is a negative mood state in response to an anticipated threat characterised by worry, tension, and physiological hyperarousal (Antony, Bieling, Cox, Enns & Swinsom, 1998). Stress refers to a state when an individual perceives that the demands upon them exceed their capacity to cope (Cohen, Kessler & Gordon, 1995), which can result in tension, irritability and a tendency to overreact (Antony et al., 1998). One study found that 73% of parents of children with ADHD have clinically significant levels of stress (Narkunam et al., 2012). Research has indicated that increased parental stress affects the parent-child relationship and parents may be less able to implement interventions to help their child/ren with ADHD (Theule, Wiener, Rogers & Marton, 2011).

Parents of children with ADHD are under equal to greater stress compared to parents of children with emotional disorders, chronic medical conditions, and developmental disabilities (Cappe, Bolduc, Rougé, Saiag & Delorme, 2016). However, levels of parental distress appear to be similar for children with ASD and ADHD (van Steijn, Oerlemans, van Aken, Buitelaar & Rommelse, 2014), suggesting that parental distress may be due to factors other than the child’s disorder itself, such as the parents levels of social and economic support and maladaptive

parental cognitions.

Current treatment approaches for ADHD focus almost exclusively on interventions for the child, but disregard parental distress. Limited research has examined the ability of ADHD symptom severity, child externalising behaviours, and social and economic support to predict parental depression, anxiety and stress simultaneously; most studies only examine one or two predictor and outcome variables (Bones, 2017). This is problematic because each variable may predict parental distress when analyzed separately, but may produce non-significant results when analyzed concurrently with other variables (Falk et al., 2014). Simultaneous analysis of multiple predictor and outcome variables is a more beneficial approach to predicting parental distress because it more accurately measures the real-world experience of parents of children with ADHD, as there are likely to be multiple contributing factors to parental distress (Bones, 2017).

### **Child Externalising Behaviours**

The most common reason for referral to child mental health services is the presence of child externalising behaviour problems (Jones, Putt, Rabinovitch, Hubbard & Snipes, 2016). Externalising behaviours are violations of behavioural norms and involve conduct problems, emotional reactivity, and aggression (Rosen et al., 2014), which can interfere with a child's functioning (Korsch & Petermann, 2013). These behaviours can disrupt a child's social and family structure, and cause parental distress. Coping with child externalising behaviours can be challenging for parents because children who demonstrate these behaviours require close supervision and often do not respond positively to typical behaviour management strategies (Donenberg & Baker, 1993). A study of over 500 families raising a child with mental health difficulties found that greater levels of child externalising behaviours were predictive of higher

levels of caregiver strain (Sellmaier, Leo, Brennan, Kendall & Houck, 2016). This indicates that externalising behaviours are possible predictors of parental distress.

### **Child Social and Interpersonal Deficits**

ADHD behaviours, highlighted by inattentive, hyperactive, and impulsive symptoms, lie on a spectrum of severity based on a child's behavioural, cognitive, and social impairments (Owens & Jackson, 2017). Parents of children with ADHD are required to spend more time and financial resources supporting their child, and these increased demands are commonly associated with increased stress in family functioning. These demands can place stress on a parent-child relationship, where children with ADHD are viewed as more demanding, less cooperative and less independent compared to typically developing children (Graziano, McNamara, Geffken & Reid, 2011). As a result, the severity of ADHD behaviour may impact parental distress. Podolski and Nigg (2001) argued that child behaviours have a direct impact on parents and difficult child behaviours likely increase parental distress. Numerous studies have reported increased rates of parental distress as a result of child ADHD symptoms (Riley et al., 2006; Theule et al., 2011; Muñoz-Silva et al., 2017; Podolski & Nigg, 2001; Graziano et al., 2011). For example, Muñoz-Silva et al. (2017) found that parental distress is directly correlated to child ADHD severity and conduct problems, which confirmed the importance of ADHD symptom severity in the prediction of parental distress.

### **Social Support**

Social support is the provision of information or assistance that leads the recipient to feel that they are cared for, loved, and valued (Cobb, 1976). Formal social support includes that provided by health services, like health practitioners and support groups (Bluth, Roberson, Billen & Sams, 2013), and informal social support includes that provided by family, friends and

partners or spouses (Bluth et al., 2013). Measures of social support often assess perceived support because it has been found to more accurately measure available support when compared to objective measures, such as the number of friends an individual has (Zimet, Dahlem, Zimet & Farley, 1988). Perceived social support is the amount of social support that is perceived to be available by an individual (Kawachi & Berkman, 2001).

Previous research has indicated that increased social support is an important coping mechanism and decreased social support can predict depression (Dour et al., 2014). However, families of children with ADHD have been found to have lower levels of social support from family and friends than families of children without ADHD (Theule et al., 2011). One study found a significant effect of social support, indicating that parents of children with ADHD and lower levels of social support experienced increased levels of depression, anxiety and stress (Theule et al., 2011). This supports the idea that perceived social support is a possible predictor of parental distress in this population.

### **Economic Support**

Raising a child with mental health challenges can cause financial strain. According to the 2009-2010 US National Survey of Children with Special Health Care Needs, 22% of caregivers reported having spent more than \$1,000 per year on medical costs and having experienced financial problems due to these expenses (Sellmaier et al., 2016). Both the direct costs of treatment and additional supports, as well as the indirect costs of lost income when employment hours are reduced due to care responsibilities or when employment ceases altogether, can cause a financial burden (Sellmaier et al., 2016). Swensen et al. (2003) estimated that family members of a child with ADHD had an annual expenditure of direct costs averaging \$1,574 and indirect costs of \$1,254.



Bones (2017) found socio-economic support had a direct effect on parental distress, as well as an indirect effect via maladaptive parental cognitions. This finding highlights the role of socio-economic support as a predictor of depression, anxiety and stress in parents of children with ADHD.

### **Maladaptive Parental Cognitions**

Growing research indicates that parent-centric variables, such as cognitions, may be better predictors of parental distress than child-centric variables, such as child externalising behaviours (Falk et al., 2014). Theule et al. (2011) found that increased parenting stress may affect the parent-child relationship and negatively impact parenting practices for parents of children with ADHD. Parental locus of control (PLOC) and limit setting ability are two parental cognitions that have been examined in parents of children with disabilities. Both variables refer to a parent's ability to effectively control their child's behaviour and are negatively correlated with higher levels of parental distress (Falk et al., 2014).

#### *Parental Locus of Control*

Parental locus of control refers to the degree of control a parent believes they have over their child's behaviour, in addition to parental perceptions about the degree of control their child has over their life (Campis, Lyman & Prentice-Dunn, 1986). Research suggests that parents with an internal locus of control may view their child's behaviour as within parental control (Kokkinos & Panayiotou, 2007) and as a result, be more motivated to implement strategies to address poor behaviour. In contrast, an external parental locus of control may result in increased parental distress because parents may feel that their child's behaviour is out of parental control. Bones (2017) found that higher levels of maladaptive parental cognitions, with the presence of a more external locus of control, predicted increased parental distress.

### *Limit Setting Ability*

Limit setting ability is a parent's belief regarding their ability to discipline and set limits for their children, with the intent to increase appropriate behaviours and reduce undesirable behaviours (Gerard, 1994). Increased limit setting ability is considered a positive parenting skill, while decreased levels are associated with higher levels of parental distress (Falk et al., 2014). Bones (2017) found a negative correlation between limit setting ability and parental distress, with lower limit setting ability predicting increased parental depression, anxiety and stress.

### **Aims and Hypotheses**

The current study aimed to extend the findings of Bones (2017) in two ways. First, the current study examined whether the previously mentioned model validated by Bones (2017) could predict the mental health outcomes in parents of children with ADHD. Second, the current study examined whether the model could predict parental distress in other parent populations, including parents of typically developing children.

It was hypothesized that the model would be validated within an ADHD population and the model would fail to demonstrate invariance between parents of children with ADHD and those with typically developing children. It was also hypothesized that parents of children with ADHD would have moderate-high levels of depression, anxiety and/or stress.

## **Method**

### **Design**

The current study was a cross-sectional correlational design. The independent variables were child externalising behaviours, ADHD severity, parental locus of control, limit setting ability, social support and economic support. The dependent variables were parental depression, anxiety and stress.

## **Participants**

The current study recruited parents of children, aged between 4 years 0 months and 17 years 11 months, with ADHD and without ADHD. ADHD diagnosis was confirmed through parental report. Parents of children without ADHD were recruited to determine the effectiveness of the model being tested to differentiate between parents of children with ADHD and parents of children without ADHD. This study aimed to recruit a minimum of 230 participants in order to detect a moderate effect size of .3 and achieve a power of .95. The total number of respondents was 210; 3 participants were excluded because they reported on children older than the age restriction of 17 years 11 months; 50 participants were excluded because they did not complete the distress measure included in the survey; and 15 participants were excluded due to additional incomplete data (most likely due to the length of the questionnaire and the non-compulsory nature of questions). The resulting total sample size was 142, with 120 being parents of children with ADHD and 22 being parents of typically developing children. See Appendix A for demographic information about the parents and Appendix B for demographic information about the children.

Participants were recruited through advertisements on Facebook ADHD support groups, including Australian ADHD Support Group, ADHD/ADD/ODD/SPD Australian Support, and Parenting a Child with ADHD, flyers and psychology lectures at the University of Tasmania, flyers displayed in local Tasmanian doctors offices, online through the Australian Psychology Society, and in Tasmanian Department of Education school newsletters (see flyers in Appendix F and Appendix G).

## **Measures**

The measures used in the current study were the same as those used by Bones (2017),

with the exception of substituting an ADHD measure in place of the ASD measure. Cronbach's alpha values for all measures are provided in the results section. The questionnaire battery included the following scales:

The short form Depression, Anxiety, and Stress Scale (DASS-21: Lovibond & Lovibond, 1995) was used to measure parental distress. The scale contains three 7-item scales that measure the dependent variables of depression, anxiety and stress (Henry & Crawford, 2005). The items are presented as a statement where respondents indicate the level to which the item applies to them. Answers are given on a 4-point Likert scale ranging from 0 "Did not apply to me at all" to 3 "Applied to me very much, or most of the time" (Lovibond & Lovibond, 1995). Scores range between 0 and 21, where higher scores indicate increased severity of depression, anxiety and stress symptoms (Lovibond & Lovibond, 1995). The DASS-21 has good internal consistency with Cronbach's alpha values of .81, .73 and .81 for the depression, anxiety and stress scales respectively (Lovibond & Lovibond, 1995).

The Berlin Social Support Scale (BSSS: Schwarzer & Schulz, 2000) was used to measure social support. The scale contains 52 items on a 4-point Likert scale ranging from 1 "strongly disagree" to 4 "strongly agree". Respondents are presented with statements and indicate their level of agreement with each statement. The BSSS contains 6 subscales: perceived support, actually provided support, received support, need for support, support seeking, and protective buffering (Schwarzer & Schulz, 2000). Scores range between 8 and 32, where higher scores indicate increased levels of perceived support (Schwarzer & Schulz, 2000). The BSSS has acceptable internal consistency, with Cronbach's alpha values for the sub scales ranging from .63 to .83 (Schwarzer & Schulz, 2000).

Two items developed by Falk et al. (2014) were used to measure economic support. These items are on a 5-point Likert scale ranging from 1 “strongly disagree” to 5 “strongly agree” (Bland & Altman, 1997). Scores range between 2 and 10, where higher scores indicate increased levels of perceived economic support (Falk et al., 2014). This economic support measure has acceptable internal consistency, with a Cronbach’s alpha value of .84 (Falk et al., 2014).

The Disruptive Behaviour Rating Scale-2<sup>nd</sup> Edition (DBRS-II; Erford, Miller & Isbister, 2015) was used to measure child ADHD severity. In this study, the questions were adjusted for report by a parent of a child with ADHD. The DBRS-II is a shortened, self-report measure of ADHD consisting of 35 items measured on a 4-point Likert scale and respondents are presented with types of behaviours and are asked to report how often their child displays each behaviour. Responses range from “rarely” occurring behaviour to behaviour occurring “most of the time” (Erford et al., 2015). There are five subscales measured: inattention, impulsive-hyperactivity, oppositional behaviour, antisocial conduct, and anxiety (Erford et al., 2015). Estimates of internal consistency range from .74 to .83 for all subscales (Erford et al., 2015).

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 2001) was used to measure child externalising behaviours. The SDQ contains 25 items on a 3-point Likert scale where respondents are asked to consider their child’s behaviour and rate the accuracy of the provided statements. The responses range from 0 “not true” to 2 “certainly true”. There are five subscales: emotional, conduct, hyperactivity-inattention, peer, and pro-social. Scores range between 0 and 40, where higher scores indicate increased behaviour problems. The SDQ has acceptable internal consistency, with a Cronbach’s alpha value of .63 for the conduct problems subscale (Goodman, 2001), which was utilised in the current study.

One item developed by Falk et al. (2014) was used to measure aggressive behaviour. The item is on a 3-point Likert scale ranging from 1 “not true” to 3 “certainly true”. Scores range between 0 and 2, where higher scores indicate increased levels of aggressive behaviour (Falk et al., 2014).

The Parent-Child Relationship Inventory (PCRI: Gerard, 1994) was used to measure parental cognitions, with a focus on parental perception of parent-child attachment. This is a self-report questionnaire containing 78 items on a 4-point Likert scale. Respondents are presented with statements and asked to rate how they feel about their child. Responses range from “strongly agree” to “strongly disagree” and scores range between 0 and 36, where higher scores indicate decreased levels of limit setting ability (Gerard, 1994). The PCRI contains seven scales, three of which were used in the current study: satisfaction with parenting, perceived parental involvement, and perceived limit setting ability (Gerard, 1994). The PCRI has acceptable internal consistency, with Cronbach’s alpha values of .70 or above for all subscales, and a median value of .82 (Gerard, 1994).

A short form of the Parental Locus of Control Scale (PLOC: Campis et al., 1986) was used to measure parental locus of control. The short form PLOC contains 24 items on a 5-point Likert scale and respondents are presented with statements where they indicate their level of agreement with each. Responses range from “strongly disagree” to “strongly agree”. The PLOC contains 5 measurements: parental efficacy, parental responsibility, fate/chance, child control of parent’s life, and parental control of child’s behaviour (Campis et al., 1986). Scores range between 25 and 125, where higher scores indicate a more external locus of control and lower scores indicate a more internal locus of control (Campis et al., 1986). The PLOC has good internal consistency with a Cronbach’s alpha value of .92 (Campis et al., 1986).

## **Procedure**

Participants were asked to follow a link to complete an online survey. They first viewed the information sheet with the purpose, method, and risks/benefits of the study. Following review of the information sheet, participants were prompted to begin the questionnaire. As stated on the information sheet, submission of the responses implied participant consent. When responding to questions related to a child, participants were asked to answer based on the same child throughout the survey. This was to ensure consistency so that parental scores across each measure were related to the same child. At the conclusion of the survey, participants were thanked and had the choice to follow a link to a separate survey to place them in the draw to receive one of eight \$50 Coles-Myer vouchers as compensation for their time.

## **Ethics**

The Tasmanian Social Sciences Human Research and Ethics Committee granted ethical approval (H0017272; Appendix I). Participants in this study were asked about their child's disorder and behaviour, in addition to their own mental health. This had the potential to induce anxiety; however, mechanisms were put in place to reduce possible distress from recalling stressful events or personal information. Participants were provided with contact details for Lifeline and BeyondBlue in the event they experienced any distress during the study. The information sheet outlined any possible risks and benefits (Appendix H). Additionally, participants had the option to withdraw from the study at any time before submitting their survey responses. The data was non-identifiable and will be destroyed after five years.

## **Data Analysis**

Data was analysed using IBM SPSS Statistics version 21. Upon checking the data for assumptions and outliers, minimal outliers were detected. However, histograms revealed that the

distribution of errors was acceptable and due to the clinical nature of this study and the resulting outliers (scores of parental depression, anxiety and stress), some extreme scores were expected. As a result, the outliers were retained in the data set. Hierarchical linear regression was conducted to investigate the predictive power of child ADHD on parental distress. At each step in the regression analysis, the change in *R*-square was used as an indicator of the predictive power of each group of variables when previous variables were taken into account.

In Bones (2017) previous study, Structural Equation Modeling (SEM) was conducted. Ideally, SEM would have been used in the current study to determine if Model A was a good fit for the data and demonstrated invariance for parents of children with ADHD compared to parents of typically developing children. However, SEM requires a sample size of 200-300 participants (Blunch, 2013), which the current study failed to reach.

## Results

### Descriptive Statistics

Descriptive statistics for the variables for the whole sample (Table 1) are presented below.

Table 1. *Descriptive Statistics and Cronbach's Alphas for Study Variables for the Whole Sample*

Variable	<i>M</i>	<i>SD</i>	<i>α</i>
Depression	13.94	7.11	.75
Anxiety	15.63	9.04	.84
Stress	9.56	7.54	.83
Social Support	119.14	58.48	.91
Economic Support	4.99	3.48	.69



Conduct Problems	8.28	6.08	.82
Aggressive Behaviour	1.19	0.99	<sup>a</sup>
Limit Setting	63.41	40.30	.96
Parental Locus of Control	47.02	32.46	.81
ADHD Severity	29.42	29.31	.92

$M$  = Mean

$SD$  = Standard Deviation

$\alpha$  = Cronbach's alpha

<sup>a</sup> No Cronbach's alpha value for aggressive behaviour (single-item measure)

Results revealed that compared to normative data, depression levels in the whole sample were in the moderate range, anxiety levels were in the severe range, and stress levels were in the normal range.

Descriptive statistics for parents of children with ADHD and parents of typically developing children (Table 2) are presented below.

Table 2. *Descriptive Statistics and T-test Results of Variables for Parents of Children with ADHD and Parents of Typically Developing Children*

Variable	Parents of Children with ADHD		Parents of Typically Developing Children		$t$ value	$d$ value
	$M$	$SD$	$M$	$SD$		
Depression	15.17	7.27	10.18	4.93	4.06**	.82
Anxiety	16.99	9.05	12.00	7.63	3.48**	.67

Stress	10.60	7.74	6.64	5.84	3.13**	.62
Social Support	133.44	44.48	92.61	72.19	4.42**	.79
Economic Support	5.68	3.14	3.86	3.86	3.86**	.57
Conduct Problems	10.83	5.38	3.23	3.94	9.94**	.97
Aggressive Behaviour	3.00	1.48	0.64	0.78	6.51**	.92
Limit Setting Ability	75.14	35.01	39.36	40.11	5.91**	.87
Parental Locus of Control	57.31	28.90	28.68	30.87	6.75**	.79

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\*\* =  $p < .001$

$M$  = Mean

$SD$  = Standard Deviation

$d$  = Cohen's  $d$  effect size

$N$  (parents of children with ADHD) = 120

$N$  (parents of typically developing children) = 22

Parents of children with ADHD had moderate depression levels and severe anxiety levels, while parents of typically developing children had mild depression levels and moderate anxiety levels. Parents of children with ADHD and parents of typically developing children both had stress scores in the normal range. The higher levels of distress among parents of children with ADHD were expected based on previous research that has indicated parents of children with ADHD experience higher levels of depression, anxiety and stress compared to parents of typically developing children (O'Brien et al., 2017). Parents of children with ADHD also reported higher scores on measures of child externalising behaviour, aggressive behaviour, limit

setting ability, and parental locus of control.

Independent samples *t*-tests were conducted to compare parents of children with ADHD and parents of typically developing children on each of the variables (Table 2). Bonferroni adjustments were not conducted because the data were independent across tasks and a single hypothesis was being tested. According to Perneger (1998), describing the tests of significance performed and why, in addition to discussing interpretations of each result, is a suitable way of dealing with multiple comparisons. It was found that there was a significant difference between parents of children with ADHD and parents of typically developing children on all variables. Parents of children with ADHD reported significantly higher levels of distress (depression, anxiety and stress), child externalising behaviours (conduct problems and aggressive behaviour), maladaptive parental cognitions (limit setting ability and parental locus of control), social support, and economic support. This analysis acted as a validity check to confirm that in the current sample, parents of children with ADHD differed significantly from parents of typically developing children.

### **Correlation Analysis**

Correlations between variables were calculated using Pearson Correlation Coefficients to detect any problems with collinearity. Correlation coefficients (Table 3) are presented below.

Table 3. *Pearson Correlation Statistics for Variables*

Variable	Dep	Anx	Stre	SocSu	EcoSu	ConPr	Agg	LimSe	PLOC
Depression	-	-	-	-	-	-	-	-	-
Anxiety	.67*	-	-	-	-	-	-	-	-
Stress	.71*	.71*	-	-	-	-	-	-	-
Social Support	.08	.10	.16	-	-	-	-	-	-
Economic Support	-.26*	-.36*	-.35*	.52	-	-	-	-	-
Conduct Problems	.57*	.49*	.53*	.52*	.42*	-	-	-	-
Aggression	.34*	.36*	.38*	.44*	.32*	.71*	-	-	-
Limit Setting	.31*	.28*	.28*	.55*	.46*	.87*	.68*	-	-
PLOC	.39*	.40*	.32*	.54*	.40*	.75*	.62*	.92*	-
ADHD Severity	.55*	.51*	.51	.41*	.23*	.71*	.62*	.64*	.59*

\* =  $p < .05$

PLOC = parental locus of control

High correlations were found between some predictors. Due to the nature of this study and the aim to test an existing model, all variables were retained despite collinearity issues. High correlations of .67 and .71 were found between depression, anxiety and stress. These moderate to strong relationships were expected due to the high factor correlations of the DASS-21 (Lovibond & Lovibond, 1995). A high correlation coefficient of .92 was found between limit setting and parental locus of control. The presence of an internal parental locus of control, where an individual attributes events to their own success rather than chance, has been found to predict the use of limit setting practices (Kokkinos & Panayiotou, 2007). As a result, this high correlation

between limit setting and parental locus of control is theoretically reasonable. For example, a parent with an internal locus of control may have better limit setting ability because they feel in control of their child's behaviour. In contrast, a parent with an external locus of control may have lower limit setting ability because they believe they are not in control of their child's behaviour, regardless of their efforts. A high correlation coefficient of .71 was found between conduct problems and aggressive behaviour. This was expected due to the high factor correlations of the SDQ (Gómez-Beneyto et al., 2013). High correlations were also found between conduct problems and limit setting ability, conduct problems and parental locus of control, conduct problems and ADHD severity, ADHD severity and limit setting ability, aggression and limit setting ability, aggression and parental locus of control, and aggression and ADHD severity.

In Bones (2017) previous research, no correlations were found above .80. However, due to the smaller sample size in the current study, it is difficult to determine if these higher correlations are a true reflection of the relationship between variables or an artefact of the study being underpowered, and therefore potentially more heterogeneous or homogeneous than larger samples.

### **Hierarchical Regression Analysis**

Before analysis, general assumptions of multiple regression were tested. All VIF values were less than 10 and all tolerance values were greater than .02, which indicated that the assumption of multicollinearity was met (Myers, 1990). Tests of normality and histograms revealed that there was no evidence of heteroscedasticity and the distribution of errors was acceptable. As a result, the models were accepted and hierarchical regression was conducted to regress the predictors listed in Table 2 against depression, anxiety and stress.

### *Hierarchical Models for Depression*

A seven-stage hierarchical regression was first run with depression as the dependent variable for the parents of children with ADHD sample. Based on previous research by Bones (2017), ADHD severity was 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. Regression statistics (Table 4) are presented below.

Table 4. *Summary of Hierarchical Regression Analysis for Variables Predicting Depression for Parents of Children with ADHD*

Variable	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	$R^2$	$\Delta R^2$	<i>F</i>	$\Delta F$	Sig $\Delta F$
Model 1 (Step 1)					.30	.31	52.55*	52.55	.00
ADHD Severity	.20	.03	.56	7.25*					
Model 2 (Step 2)					.30	.00	26.05*	.001	.98
ADHD Severity	.20	.03	.56	7.20*					
Social Support	.00	.02	-.002	-.03					
Model 3 (Step 3)					.29	.00	17.49*	.56	.46
ADHD Severity	.20	.03	.52	5.57*					
Social Support	.00	.02	.00	.05					
PLOC	.02	.03	.07	.75					
Model 4 (Step 4)					.29	.00	13.06*	.15	.70
ADHD Severity	.18	.04	.50	4.96*					
Social Support	.00	.02	.00	.05					

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PLOC	.02	.03	.07	.75					
Aggression	.29	.73	.03	.39					
Model 5 (Step 5)					.29	.01	10.81*	1.56	.21
ADHD Severity	.13	.06	.35	2.26*					
Social Support	-.00	.02	-.00	-.03					
PLOC	.02	.03	.07	.77					
Aggression	.31	.73	.04	.43					
Conduct Problems	.31	.25	.18	1.25					
Model 6 (Step 6)					.31	.02	9.87*	3.84	.053
ADHD Severity	.14	.06	.39	2.50*					
Social Support	-.00	.02	-.01	-.10					
PLOC	.09	.05	.29	2.01					
Aggression	.46	.72	.06	.64					
Conduct Problems	.34	.24	.19	1.39					
Limit Setting Ability	-.08	.04	-.30	-1.96					
Model 7 (Step 7)					.30	.00	8.40*	.04	.84
ADHD Severity	.14	.06	.38	2.25*					
Social Support	-.00	.02	-.01	-.10					
PLOC	.09	.05	.29	1.94					
Aggression	.44	.73	.05	.61					
Conduct Problems	.35	.26	.20	1.38					
Limit Setting Ability	-.08	.04	-.30	-1.94					
Economic Support	-.05	.25	-.02	-.20					

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\* =  $p < .05$

$B$  = Unstandardized Regression Coefficient

$SE$  = Standard Error of Unstandardized Regression Coefficient

$\beta$  = Standardized Coefficient

PLOC = parental locus of control

Results indicated that the first model was significantly better than no model at predicting depression in parents of children with ADHD. Models 2 through 7 were not found to be significantly better when compared to the first model. However, the model was supported and all models were found to be significant, individually. Model 1 accounted for 30% of the variance in depression, while the subsequent models reveal that the addition of social support, parental locus of control, aggressive behaviour, conduct problems, limit setting ability, and economic support did not significantly increase the predictive capacity of predicting depression in parents of children with ADHD. None of the variables were unique predictors of parental depression, but together, all variables significantly contributed to predicting depression in parents of children with ADHD. Model 1, with ADHD severity as the sole variable, was selected as the best predictor of depression in parents of children with ADHD. The variance between all models was only slight, with model 1 the most parsimonious.

A six-stage hierarchical regression was then run for parents of typically developing children with depression as the dependent variable. Based on previous research by Bones (2017), social support was entered at stage one, parental locus of control at stage two, aggressive behaviour at stage three, conduct problems at stage four, limit setting ability at stage five, and economic support at stage six. Regression statistics (Table 5) are presented below.



Table 5. *Summary of Hierarchical Regression Analysis for Variables Predicting Depression for Parents of Typically Developing Children*

Variable	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	$R^2$	$\Delta R^2$	<i>F</i>	$\Delta F$	Sig $\Delta F$
Model 1 (Step 1)					-.05	.01	.09	.09	.76
Social Support	-.02	.06	-.07	-.31					
Model 2 (Step 2)					.22	.29	3.90*	7.67	.01
Social Support	-.02	.05	-.09	-.45					
PLOC	.17	.06	.54	2.77*					
Model 3 (Step 3)					.22	.04	2.96	1.06	.32
Social Support	-.01	.05	-.05	-.27					
PLOC	.15	.07	.44	2.08					
Aggression	1.73	1.68	.22	1.03					
Model 4 (Step 4)					.20	.02	2.27	.48	.50
Social Support	-.02	.05	-.09	-.44					
PLOC	.15	.07	.47	2.13*					
Aggression	1.17	1.89	.15	.62					
Conduct Problems	.24	.35	.15	.69					
Model 5 (Step 5)					.20	.05	2.08	1.20	.29
Social Support	-.03	.05	-.12	-.60					
PLOC	.14	.07	.43	1.97					
Aggression	.54	1.96	.07	.26					
Conduct Problems	.29	.35	.18	.83					
Limit Setting	.17	.15	.23	1.09					

Model 6 (Step 6)					
Social Support	-.04	.06	-.15	-.67	
PLOC	.15	.08	.45	1.95	
Aggression	.70	2.06	.09	.34	
Conduct Problems	.27	.36	.18	.77	
Limit Setting Ability	.17	.16	.24	1.08	
Economic Support	.17	.44	.09	.39	

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\* =  $p < .05$

$B$  = Unstandardized Regression Coefficient

$SE$  = Standard Error of Unstandardized Regression Coefficient

$\beta$  = Standardized Coefficient

PLOC = parental locus of control

Results indicated that model 2, with the addition of parental locus of control, was significantly better than no model at predicting depression in parents of typically developing children. It was found that parental locus of control was the only unique predictor of depression in parents of typically developing children. The remaining models were not significantly better than no model. Only model 2 was found to be significant individually. The remaining models revealed that the addition of social support, aggressive behaviour, conduct problems, limit setting ability, and economic support does not increase the predictive capacity of predicting parental depression in parents of typically developing children. Model 2, with social support and parental locus of control as the included variables, was selected as the best predictor of depression in parents of typically developing children. The variance explained by model 1 was negative,

showing that the most parsimonious model was not the best and that social support alone does not help to predict depression. Model 2 exhibited a significant  $F$  change and explained a variance of 21.6%. Model 2 improved the predictive capacity of depression in parents of typically developing children more than would be expected by chance.

#### *Hierarchical Models for Anxiety*

A seven-stage hierarchical regression was run with anxiety as the dependent variable for the parents of children with ADHD sample. Based on previous research by Bones (2017), ADHD severity was 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. Regression statistics (Table 6) are presented below.

Table 6. *Summary of Hierarchical Regression Analysis for Variables Predicting Anxiety for Parents of Children with ADHD*

Variable	$B$	$SE$	$\beta$	$t$	$R^2$	$\Delta R^2$	$F$	$\Delta F$	Sig $\Delta F$
Model 1 (Step 1)					.31	.32	55.17*	55.17	.00
ADHD Severity	.26	.04	.56	7.43*					
Model 2 (Step 2)					.31	.01	27.98*	.86	.36
ADHD Severity	.26	.04	.56	7.35*					
Social Support	.02	.02	.07	.93					
Model 3 (Step 3)					.32	.01	19.30*	1.63	.21
ADHD Severity	.23	.04	.50	5.42*					
Social Support	.03	.02	.08	1.06					

PLOC	.05	.04	.12	1.28					
Model 4 (Step 4)					.32	.01	14.91*	1.49	.23
ADHD Severity	.21	.05	.45	4.54*					
Social Support	.02	.02	.08	1.04					
PLOC	.05	.04	.12	1.30					
Aggression	1.08	.89	.10	1.22					
Model 5 (Step 5)					.33	.02	12.75*	3.07	.08
ADHD Severity	.30	.07	.65	4.29*					
Social Support	.03	.02	.09	1.14					
PLOC	.05	.04	.12	1.28					
Aggression	1.04	.88	.10	1.19					
Conduct Problems	-.53	.30	-.24	-1.75					
Model 6 (Step 6)					.37	.04	12.41*	7.21	.01
ADHD Severity	.32	.07	.70	4.69*					
Social Support	.02	.02	.08	1.08					
PLOC	.16	.05	.40	2.91*					
Aggression	1.29	.87	.12	1.50					
Conduct Problems	-.47	.29	-.22	-1.62					
Limit Setting Ability	-.13	.05	-.39	-2.69*					
Model 7 (Step 7)					.37	.01	10.94*	1.69	.20
ADHD Severity	.28	.07	.62	3.91*					
Social Support	.03	.02	.08	1.08					
PLOC	.15	.06	.37	2.65*					

Aggression	1.16	.87	.11	1.34
Conduct Problems	-.36	.31	-.16	-1.16
Limit Setting Ability	-.13	.05	-.38	-2.65*
Economic Support	-.38	.29	-.11	-1.30

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\* =  $p < .05$

$B$  = Unstandardized Regression Coefficient

$SE$  = Standard Error of Unstandardized Regression Coefficient

$\beta$  = Standardized Coefficient

PLOC = parental locus of control

Results indicated that model 1 was significantly better than no model at predicting anxiety in parents of children with ADHD and model 6, with the addition limit setting, further improved the model's predictive capacity. The remaining models were not found to be significantly better at predicting parental anxiety when compared to the first model. However, all models were found to be significant, individually. Model 1 accounted for 31% of the variance in anxiety and model 6 accounted for 37% of the variance, while all other models revealed that the addition of social support, parental locus of control, aggressive behaviour, conduct problems, and economic support do not significantly increase the predictive capacity of predicting anxiety in parents of children with ADHD. Limit setting ability was found to be a unique predictor of anxiety in parents of children with ADHD. Model 6, with ADHD severity, social support, parental locus of control, aggressive behaviour, conduct problems, and limit setting ability as the included variables, was selected as the best predictor of anxiety in parents of children with ADHD. This model exhibited a significant  $F$  change and explained 36.5% of the variance, considerably

greater than the more parsimonious model 1. This indicated that inclusion of the variables in model 6 improved the predictive capacity of anxiety in parents of children with ADHD more than would be expected by chance.

A six-stage hierarchical regression was then run for parents of typically developing children with anxiety as the dependent variable. Based on previous research by Bones (2017), social support was entered at stage one, parental locus of control at stage two, aggressive behaviour at stage three, conduct problems at stage four, limit setting ability at stage five, and economic support at stage six. Regression statistics (Table 7) are presented below.

Table 7. *Summary of Hierarchical Regression Analysis for Variables Predicting Anxiety for Parents of Typically Developing Children*

Variable	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	$R^2$	$\Delta R^2$	<i>F</i>	$\Delta F$	Sig $\Delta F$
Model 1 (Step 1)					-.04	.01	.211	.21	.65
Social Support	-.04	.09	-.10	-.46					
Model 2 (Step 2)					.26	.32	4.63*	8.97	.01
Social Support	-.05	.08	-.12	-.64					
PLOC	.29	.10	.56	3.00*					
Model 3 (Step 3)					.22	.01	2.96	.07	.79
Social Support	-.05	.08	-.11	-.57					
PLOC	.27	.11	.54	2.53*					
Aggression	.69	2.60	.06	.27					
Model 4 (Step 4)					.46	.23	5.51*	9.15	.01
Social Support	-.10	.07	-.25	-1.50					

PLOC	.32	.09	.63	3.51*					
Aggression	-2.41	1.39	-.20	-1.01					
Conduct Problems	1.32	.44	.55	3.03*					
Model 5 (Step 5)					.45	.02	4.45*	.65	.43
Social Support	-.11	.07	-.27	-1.59					
PLOC	.31	.09	.61	3.33*					
Aggression	-3.00	2.52	-.25	-1.19					
Conduct Problems	1.37	.45	.57	3.07*					
Limit Setting	.16	.20	.14	.81					
Model 6 (Step 6)					.43	.01	3.66*	.46	.51
Social Support	-.13	.07	-.31	-1.69					
PLOC	.32	.10	.63	3.33*					
Aggression	-2.66	2.62	-.22	-1.02					
Conduct Problems	1.33	.46	.55	2.93*					
Limit Setting Ability	.16	.20	.15	.81					
Economic Support	.38	.57	.13	.68					

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\* =  $p < .05$

$B$  = Unstandardized Regression Coefficient

$SE$  = Standard Error of Unstandardized Regression Coefficient

$\beta$  = Standardized Coefficient

PLOC = parental locus of control

Results indicated that model 2, with the addition of parental locus of control, and model 4, with the addition of conduct problems, significantly improved upon model 1 in predicting anxiety in the parents of typically developing children. It was found that parental locus of control and conduct problems were the only unique predictors of anxiety in parents of typically developing children. Model 2 accounted for 26% of the variance in anxiety and model 4 accounted for 46% of the variance in anxiety, while the other models revealed that the addition of social support, aggressive behaviour, limit setting ability, and economic support did not significantly increase the predictive capacity of predicting parental anxiety. In addition, models 2, 4, 5 and 6 were found to be significant individually. Model 4, with social support, parental locus of control, aggression, and conduct problems as the included variables, was selected as the best predictor of anxiety in parents of typically developing children. In addition to a significant  $F$  change, Model 4 explained a considerably larger variance of 46.2% and improved the predictive capacity of anxiety for parents of typically developing children more than would be expected by chance.

#### *Hierarchical Models for Stress*

A seven-stage hierarchical regression was run with stress as the dependent variable for the parents of children with ADHD sample. Based on previous research by Bones (2017), ADHD severity was 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. Regression statistics (Table 8) are presented below.



Table 8. *Summary of Hierarchical Regression Analysis for Variables Predicting Stress for Parents of Children with ADHD*

Variable	<i>B</i>	<i>SE</i>	$\beta$	<i>T</i>	$R^2$	$\Delta R^2$	<i>F</i>	$\Delta F$	Sig $\Delta F$
Model 1 (Step 1)					.34	.35	62.40*	62.40	.00
ADHD Severity	.23	.03	.59	7.90*					
Model 2 (Step 2)					.36	.02	34.35*	4.47	.04
ADHD Severity	.26	.03	.58	7.86*					
Social Support	.04	.02	.16	2.11*					
Model 3 (Step 3)					.35	.00	22.72*	.03	.86
ADHD Severity	.23	.03	.59	6.61*					
Social Support	.04	.02	.15	2.08*					
PLOC	-.01	.03	-.02	-.18					
Model 4 (Step 4)					.36	.01	17.67*	1.95	.17
ADHD Severity	.21	.04	.54	5.58*					
Social Support	.04	.02	.15	2.06*					
PLOC	-.01	.03	-.01	-.15					
Aggression	1.02	.73	.11	1.40					
Model 5 (Step 5)					.36	.00	14.23*	.66	.42
ADHD Severity	.24	.06	.63	4.22*					
Social Support	.04	.02	.16	2.10*					
PLOC	-.01	.03	-.02	-.17					
Aggression	1.01	.73	.11	1.37					
Conduct Problems	-.20	.25	-.11	-.81					

Model 6 (Step 6)					.36	.01	12.27*	1.93	.17
ADHD Severity	.25	.06	.65	4.37*					
Social Support	.04	.02	.15	2.06*					
PLOC	.05	.05	.13	.97					
Aggression	1.12	.74	.13	1.52					
Conduct Problems	-.18	.25	-.10	-.73					
Limit Setting Ability	-.06	.04	-.20	-1.39					
Model 7 (Step 7)					.37	.01	10.91*	2.07	.15
ADHD Severity	.22	.06	.57	3.57*					
Social Support	.04	.02	.15	2.07*					
PLOC	.13	.05	.10	.71					
Aggression	.99	.74	.11	1.34					
Conduct Problems	-.07	.26	-.04	-.26					
Limit Setting Ability	-.06	.04	-.19	-1.35					
Economic Support	-.36	.25	-.13	-1.44					

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\* =  $p < .05$

$B$  = Unstandardized Regression Coefficient

$SE$  = Standard Error of Unstandardized Regression Coefficient

$\beta$  = Standardized Coefficient

PLOC = parental locus of control

Results indicated that model 1 was significantly better than no model at predicting stress in parents of children with ADHD and model 2, with the addition of social support, further

enhanced its predictive capacity. The remaining models were not found to be significantly better at predicting parental stress when compared to the first model. However, all models were found to be significant, individually. Model 1 accounted for 34% of the variance in stress and model 2 accounted for 36% of the variance in stress. The remaining models indicated that the addition of limit setting ability, parental locus of control, aggressive behaviour, conduct problems, and economic support did not significantly increase the predictive capacity of predicting stress in parents of children with ADHD. Model 2, with ADHD severity and social support as the included variables, was selected as the best predictor of stress in parents of children with ADHD. This model exhibited a significant  $F$  change and explained a greater proportion of the variance than the more parsimonious model 1, indicating that the inclusion of ADHD severity and social support improved the predictive capacity of stress in parents of children with ADHD more than would be expected by chance.

A six-stage hierarchical regression was then run for parents of typically developing children with stress as the dependent variable. Based on previous research by Bones (2017), social support was entered at stage one, parental locus of control at stage two, aggressive behaviour at stage three, conduct problems at stage four, limit setting ability at stage five, and economic support at stage six. Regression statistics (Table 9) are presented below.

Table 9. *Summary of Hierarchical Regression Analysis for Variables Predicting Stress for Parents of Typically Developing Children*

Variable	$B$	$SE$	$\beta$	$t$	$R^2$	$\Delta R$	$F$	$\Delta F$	Sig $\Delta F$
Model 1 (Step 1)					-.041	.01	.17	.17	.68
Social Support	-.03	.07	-.09	-.41					

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Model 2 (Step 2)					.02	.10	1.17	2.17	.16
Social Support	-.03	.07	-.10	-.48					
PLOC	.12	.08	.32	1.47					
Model 3 (Step 3)					-.01	.03	.93	.51	.48
Social Support	-.02	.07	-.08	-.34					
PLOC	.10	.09	.25	1.01					
Aggression	1.61	2.26	.18	.71					
Model 4 (Step 4)					.13	.16	1.76	3.82	.07
Social Support	-.06	.07	-.19	-.89					
PLOC	.12	.09	.32	1.40					
Aggression	-.34	2.33	-.04	-.14					
Conduct Problems	.83	.43	.45	1.95					
Model 5 (Step 5)					.08	.01	1.38	.18	.68
Social Support	-.06	.07	-.18	-.80					
PLOC	.13	.09	.33	1.41					
Aggression	-.03	2.49	-.00	-.01					
Conduct Problems	.81	.44	.44	1.84					
Limit Setting	-.08	.19	-.10	-.42					
Model 6 (Step 6)					.03	.00	1.09	.07	.79
Social Support	-.06	.07	-.20	-.82					
PLOC	.13	.10	.34	1.39					
Aggression	.11	2.62	.011	.04					
Conduct Problems	.793	.46	.43	1.74					

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Limit Setting Ability	-.08	.20	-.10	-.40
Economic Support	.15	.57	.07	.27

\* =  $p < .05$

$B$  = Unstandardized Regression Coefficient

$SE$  = Standard Error of Unstandardized Regression Coefficient

$\beta$  = Standardized Coefficient

PLOC = parental locus of control

Results indicated that the models were not significantly better than no model at predicting stress in the parents of typically developing children. This revealed that the addition of social support, parental locus of control, conduct problems, aggressive behaviour, limit setting ability, and economic support does not significantly increase the predictive capacity of parental stress. In addition, none of the models were found to be significant individually. Model 4, with social support, parental locus of control, aggression, and conduct problems as the included variables, was selected as the best predictor of anxiety in parents of typically developing children. The variance explained by model 1 was negative and non-significant, showing that the most parsimonious model was not the best and that social support alone does not predict anxiety in parents of typically developing children. However, model 4 was approaching significance and explained a considerably larger variance of 12.7%.

### Discussion

In order to reduce the distress experienced by parents of children with ADHD, it is necessary to know the factors affecting parental distress. The prediction of parental distress is a complex process because multiple factors are likely to contribute (Bones, 2017). Model A,

developed by Falk et al. (2014) and further investigated by Bones (2017), highlighted four factors in the prediction of parental distress. These factors are child social and interpersonal deficits, child externalising behaviours, maladaptive parental cognitions, and social and economic support. The aim of the current study was to first, examine whether the previously mentioned model validated by Bones (2017) could predict mental health outcomes in parents of children with ADHD, and second, to examine whether the model could predict parental distress in other parent populations, including parents of typically developing children.

The first hypothesis, that Model A would be validated within an ADHD parental population, was supported in the current study. Child social and interpersonal deficits (indicated by ADHD severity), child externalised behaviour (indicated by aggressive behaviour and conduct problems), maladaptive parental cognitions (indicated by limit setting ability and parental locus of control), and socio-economic support (indicated by social support and economic support) all contributed to the predictive capacity of distress in parents of children with ADHD. A model that simultaneously analyses multiple predictors more accurately measures the real world experience of parents of children with ADHD because levels of depression, anxiety and stress in parents are likely to have multiple contributing factors (Falk et al., 2014). No individual variable was confirmed as a unique predictor of parental distress in the current study, which supports a model that simultaneously analyses multiple predictors. All *F* statistics were significant in each regression analysis for depression, anxiety and stress, indicating that the overall contribution of each regression model was significant. This finding is consistent with Bones (2017) who found that the model could be validated in an ASD sample, which demonstrates the models ability to effectively predict distress in parents of children with mental disabilities. However, due to the large sample size required for SEM analysis that this study did

not achieve, fit indices could not be analysed and the level of fit cannot be determined from this study.

These findings provide further support that Model A may have universality, whereby it may be effective at predicting parental distress across parent groups. Distress in parents of children with ADHD was predicted by the same factors that predict distress in parents of typically developing children. These factors were parental locus of control, limit setting ability, social support, economic support, conduct problems, and aggressive behaviour. As a result, differences in distress between parental groups are due to variances in the magnitude of scores on these factors, rather than differences in factors themselves. This finding was also supported by Bones (2017) who found that the indicators were consistent between the parents of children with ASD sample and the parents of children without ASD sample. Bones (2017) also found that the level of distress experienced by parents of children with and without ASD differed significantly on every indicator.

The second hypothesis, predicting that parents of children with ADHD would have moderate-high levels of depression, anxiety and/or stress compared to parents of typically developing children, was also supported. *T*-test results indicated that there was a significant difference between parents of children with ADHD and parents of typically developing children on all variables. Levels of distress were significantly higher for parents of children with ADHD, who had higher levels of depression, anxiety and stress, when compared to parents of typically developing children. For parents of children with ADHD, levels of depression and anxiety were found to be in the moderate range, while levels of stress were in the normal range.

The current study has two main findings. First, Model A was replicated in a new sample: parents of children with ADHD. Most current approaches for the treatment of ADHD include

medication and behaviour therapy, both of which focus almost exclusively on the child (Goldman, Genel, Bezman & Slanetz, 1998). The current study found that in addition to child-centric factors, such as ADHD severity and child externalising behaviours, parent-centric factors, particularly parental maladaptive cognitions, are important predictors of distress in parents of children with ADHD. However, limited research exists on the effectiveness of parent-centric treatment options in this population. Due to higher levels of distress in parents of children with ADHD in the current study, parent-focused interventions should be more widely considered and researched in relation to ADHD treatment. Higher levels of depression, anxiety and stress were found in parents of children with ADHD compared to a parents of typically developing children, which indicates that parents of children with ADHD may benefit from interventions to help them cope with their child's disorder.

Second, the current study provides further evidence that Model A may effectively predict parental distress in the general population, rather than specifically in relation to ASD (Bones, 2017) or ADHD. This finding could be instrumental in the development of interventions to prevent and treat distress in parents who have children with other mental disabilities in addition to parents of typically developing children. Parental interventions could be beneficial because increased levels of depression, anxiety and stress in parents can negatively impact child behaviour, parenting ability, and parental health. Distress in parents is associated with decreased warmth and involvement with their children (Moen, Hedelin & Hall-Lord, 2016). In addition, when a primary caregiver experiences depression, anxiety or stress, he or she may be unable to effectively care for their children and the children's basic daily needs could be neglected (Cheesman, 2011). Furthermore, growing research indicates that parental mental health may negatively impact decisions made about the child's health care and education (Gargano, Dechen,



Cone, Stellman & Brackbill, 2017). High parental distress levels have also been found to increase risk of physical health conditions, such as cardiovascular disease and diabetes (Hollon, Thase & Markowitz, 2002). Research indicates that distress in parents of children with ADHD leads to lower levels of self-esteem and negative mood (Cappe et al., 2016). High levels of distress affect overall quality of life, as parents of children with ADHD are more affected psychologically, socially, physically and cognitively compared to parents of typically developing children (Cappe et al., 2016). Thus, it is important to encourage healthy mental wellbeing for parents and for parents to have access to personal mental health support and parenting interventions.

Unlike the previous findings by Bones (2017), levels of socio-economic support experienced by parents of children with ADHD in the current study were significantly higher than the levels of socio-economic support experienced by parents of typically developing children. While this finding could have been a result of sampling error or bias, it may also be explained by the inevitable need for higher social support to cope with the social stigma attached to ADHD and higher economic support to cope with the lack of government funding for children with ADHD in Australia. According to the Australian Government Department of Social Services, ADHD is not explicitly listed as a recognized disorder that is eligible for government funding, whereas Autism Spectrum Disorder is clearly outlined as a disorder that receives funding ("Guide to the List of Recognised Disabilities", 2018). As a result, parents of children with ADHD may be required to locate personal financial resources to assist with their child's educational and medical needs. This lack of financial support from the government could explain the higher levels of economic support experienced, and required, by parents of ADHD, compared to Bones' (2017) findings with parents of children with ASD. In terms of social stigma, disorders

such as ASD are commonly accepted by society as medical conditions; however, ADHD is often perceived as a behavioural problem associated with a lack of discipline at home (Mueller, Fuermaier, Koerts & Tucha, 2012). As a result, parents of children with ADHD may be judged for their inability to manage their child's defiant and impulsive behaviour. Muñoz-Silva et al. (2017) found that parents of children with ADHD experience greater parenting stress than parents of children with conditions such as Epilepsy or ASD. This relationship may be explained by the comorbid disorders that commonly appear in ADHD: oppositional defiant disorder, depression, anxiety, and learning disabilities (August, Realmuto, MacDonald, Nugent & Crosby, 1996; Muñoz-Silva et al., 2017). Not only must parents of children with ADHD manage the stress related to supporting a child with numerous disorders and rapidly changing mood and behaviour, they are also susceptible to judgment concerning their parenting skills (DosReis, Barksdale, Sherman, Maloney & Charach, 2010). Stigma is theorized as an adaptable but chronic and culturally formed environmental stressor (Mueller et al., 2012) and future research could examine the effect social stigma has on distress for parents of children with ADHD.

### **Current ADHD Treatments**

As previously mentioned, dominant treatment approaches for ADHD include medication, with approximately 80% of children diagnosed with ADHD receiving medication to reduce their symptoms (Mueller et al., 2012; Clarke, 1997), and child directed therapy (Goldman et al., 1998). ADHD is one of few health conditions affecting behaviour for which direct, child-focused therapies have been shown to be unsuccessful alone.

Parents of children with ADHD are primarily concerned with their child's functioning (Gavita, Joyce & David, 2011); however, parents should also be aware of the influence that their own mental health can have on their ability to effectively implement interventions and discipline

(Gavita et al., 2011). Parents experiencing high levels of distress may exhibit less patience and decreased ability to effectively discipline their children (Cappe et al., 2016). It is recommended that ADHD interventions take a more holistic approach by addressing parental distress through the inclusion of parent-centric interventions alongside the standard child-centric interventions.

Research with parents of children with ADHD has found increased support for alternative approaches to treatment (Leslie, Plemmons, Monn & Palinkas, 2007; Fleming et al., 2017). Psychosocial intervention programs for parents of children with ADHD have proven to be effective in reducing perceived symptom severity, improving parental knowledge of ADHD, implementing successful discipline practices, and encouraging greater parental psychological wellbeing (Shata, Abu-Nazel, Fahmy & El-Dawaiaty, 2014).

## **Parental Interventions**

### *Cognitive Behavioural Therapy*

Results from the current study indicate the need for increased support of parent interventions to reduce levels of parental distress. Maladaptive parental cognitions were found to influence parental distress in the current sample, and CBT based techniques may be effective in addressing maladaptive parental cognitions in parents of children with ADHD. Defining features of CBT are teaching clients to identify, evaluate, and respond to their negative thoughts and beliefs (Beck, 2011). This could alter a parent's perception of their parenting ability and possibly reduce overall distress in parents of children with ADHD.

Limited research has been conducted to study the effectiveness of CBT to reduce distress in parents of children with ADHD. Chronis, Gamble, Roberts and Pelham (2006) recognized that parental cognitions may negatively impact parenting and that most effective ADHD treatments typically do not address the psychological well-being of parents. They conducted a study to

investigate the effectiveness of parent-based cognitive therapy in a sample of mothers of children with ADHD. The study included a cognitive restructuring model to help change negative expectations and attributions related to child behaviour in addition to assertiveness training, as parents of children with ADHD are required to be assertive in disciplining their children and advocating for their children's educational needs. Results indicated that the intervention led to improvements in maternal depressive symptoms, self-esteem, perceived stress levels, and negative expectations regarding their children's behaviour. In addition, the study found that mothers were happy to participate in an intervention that targeted their own functioning in order to assist their child's functioning.

#### *Behavioural Parent Training*

Research has indicated that cognitive interventions alone may not significantly improve parent-child relationships or broader family functioning (Chacko et al., 2017) and may be ineffective at reducing parental distress. As a result, Behavioural Parent Training (BPT) may be useful to directly address parenting behaviours that commonly result in distress symptoms and impairment at the parent-child level (Chacko et al., 2017). BPT teaches parents how to successfully implement positive parenting strategies and discipline strategies (Babinski, Mills & Bansal, 2017).

Research conducted with children with oppositional defiant disorder and conduct disorder has indicated that BPT improves both child disruptive behaviour and maladaptive parenting behaviour, in addition to assisting parenting stress. However, research investigating these findings is limited for ADHD populations (Chronis, Chacko, Fabiano, Wymbs & Pelham, Jr., 2004).

The current study revealed that child social and interpersonal deficits and/or child

externalising behaviours did not solely predict parental distress. Maladaptive parental cognitions were a significant contributor to depression, anxiety and stress in parents of children with ADHD. As a result, parents with symptoms of depression, anxiety and/or stress would greatly benefit from parent-based interventions, such as those discussed above. Regardless of the type of treatment, a critical component in addressing specific parental stressors is a parental intervention that monitors parenting distress throughout a course of treatment and does not end treatment when the child's ADHD symptoms have been addressed (Graziano et al., 2011). Medication may be given to reduce child ADHD symptoms; however, the elevated levels of parental distress may persist. Likewise, psychological treatments may focus on reducing the child's externalising behaviour or improving discipline strategies for parents, but disregard specific parental stressors (Graziano et al., 2011). The finding that parental depression, anxiety and stress levels are not solely related to the severity of the child's ADHD symptoms is substantial and treatment options for parents should reflect that awareness.

### **Limitations**

Certain limitations need to be taken into account while drawing conclusions from the current study.

First, ADHD severity was reported solely by parent report, with no diagnostic confirmation. As a result, answers given on the survey may have been over-reported and/or misclassification bias might have been introduced if reporting parents failed to recognize their child had ADHD. A further limitation due to using parent report alone is the potential that the results were related to source variance. This study utilised different questionnaire sets for each variable; however, the use of a formal physician diagnosis, inclusion of teacher reports, and/or the use of an objective measure could have strengthened the results. However, these additional

procedures may too suffer from ecological limitations.

Second, the sample size of 122 parents of children with ADHD was smaller than anticipated. Thus, SEM analysis could not be conducted and direct comparisons to Bones' (2017) findings and validation of Model A in a new population were limited. Future research could use an increased sample size to run SEM analysis and test for model invariance.

Third, the age range of parents of children aged between 4 and 17 was relatively large and the pattern of ADHD symptoms and related difficulties for parents varies throughout this age bracket. The decision to include a wide age group was made to benefit recruitment for the study; however, this may have impacted the levels of distress reported by parents due to variances in parenting experiences based on the age of the child with ADHD.

Fourth, mothers comprised the majority (75.7%) of the sample population. This may reflect the real world reality of caring for a child with ADHD with mothers holding the greater responsibility to provide primary care for their children and potentially experience higher emotional stress. For this reason, overall levels of distress could have been elevated.

Fifth, similar to many studies conducted on parental distress in families with children with disorders, the current sample was of a middle-class background. 47.8% of participants in this study had a household income above \$80,000 and 47.1% had completed an undergraduate university degree or higher. Future research could try to rectify this misrepresentative sample by actively recruiting parents from lower socio-economic backgrounds.

A further limitation is that 57.1% of parents reported they had a current medical condition. Personal physical and mental health conditions may contribute to parental distress and may have biased scores in this study. Elevated levels of depression, anxiety and or/stress are common side effects of some psychological and physical illnesses and the associated prescribed

medications (Aneshensel, Frerichs & Huba, 1984). As a result, distress levels may not have been a direct affect of distress related to parenting a child with ADHD.

Finally, the measures used to gauge economic support and aggressive behaviour have not been psychometrically validated. However, these measures were selected due to the lack of short, psychometrically validated scales that assess economic support and child aggressive behaviour. Short measures were preferred in order to reduce fatigue and encourage full completion of the survey. Both scales have been used previously by Falk et al. (2014) and Bones (2017) and were found to have acceptable internal consistency.

### **Future Research**

Future research could obtain a larger sample and conduct Structural Equation Modeling using Model A to determine whether the model is a good fit for populations of parents with children with ADHD and whether the model demonstrates invariance for parents of children with and without ADHD.

Since Model A is now validated within an ASD population (Bones, 2017) and an ADHD population, future research could use Model A to inform the development of new parent-based interventions to prevent and treat distress in parents of children with disorders in general. CBT or BPT based interventions could be effective, and target variables should include maladaptive parental cognitions with a focus on specific cognitions related to parenting and disorder-specific issues. For example, a common symptom of ADHD is defiance. Parents with poor limit setting ability may withdraw efforts to manage their child's defiant behaviour due to their belief that some behaviours are beyond their control as a parent (Chronis et al., 2006). This parental belief negatively impacts parenting, exacerbates child behaviour problems and creates negative self-esteem (Chronis et al., 2006). Parent-based interventions that target maladaptive parental

cognitions, such as limit setting ability, may promote positive self-efficacy that could act as a protective factor against parental distress. This type of approach may assist parents in successfully applying learned strategies to the real world and increasing the chance of long-term success (Gavita et al., 2011). In addition, interventions should be developed with accessibility in mind. DuPaul et al. (2017) found that benefits of BPT interventions were hindered by limited access to support services in the community, low session attendance, and poor implementation of suggested strategies. As a result, treatment was only received by half of the target population (DuPaul et al., 2017). The effectiveness of online parental interventions could be investigated as a solution.

Future research could potentially examine the mediating relationship between parental distress and additional variables excluded from Model A. For example, resilience is a positive personal resource that may be drawn upon to cope with stress and to prevent the development of negative mental health outcomes (Morote, Hjemdal, Martinez Uribe & Corveleyn, 2017). Research reveals that an individual's level of resilience greatly affects their response to negative life events. To date, no research has been conducted to investigate the mediating effects of resilience in parents of children with ADHD. Examining the role of resilience in mental health outcomes of parents of children with ADHD could offer valuable resources to mental health professionals regarding the promotion and maintenance of psychological wellbeing (Faircloth, 2017). The current, but limited, research on resilience highlights a positive relationship between resilience and psychological wellbeing (Faircloth, 2017). As a result, evaluating an individual's resiliency resources may be an important predictor of parental distress. Future parental interventions to promote resilience by developing the ability to self-regulate emotions could be



valuable in supporting parents of children with disabilities who often live in demanding and unpredictable home environments.

## **Conclusion**

Raising a child with ADHD can be challenging for parents and the current study found that parents of children with ADHD have significantly higher levels of distress compared to parents of typically developing children. Previous research has established that high levels of distress negatively affect parental physical and mental health, parenting practices, and child functioning. As a result, a primary focus of ADHD treatments should address parental distress.

The current study provides additional support and validation for Model A to predict depression, anxiety and stress in parents of children with ADHD. The study supports the findings by Bones (2017) that socio-economic support and maladaptive parental cognitions mediate the relationship between child social and interpersonal deficits and child externalising behaviours. It is argued that future ADHD interventions must include techniques to address maladaptive parental cognitions. CBT and BPT based interventions could effectively reduce parental distress by altering negative attributions related to parenting a child with ADHD.

The current study contributes substantial evidence to the current literature concerning parents of children with ADHD and indicates that interventions to prevent and treat parental distress must be a priority. Child externalising behaviours and child social and interpersonal deficits were not the sole predictors of parental distress; parental cognitions and socio-economic support were also significant predictors of distress in parents of children with ADHD. A strong understanding of the psychological impact of raising a child with ADHD and programs to teach parents effective skills to cope with negative cognitions is necessary to improve the day-to-day functioning of children with ADHD and to encourage healthy mental wellbeing for parents.

Given the findings from the current study and the fact that ADHD is considered a chronic condition with no interventions to cure it (Chacko & Scavenius, 2017), the prevention and treatment of parental distress is imperative. Parents play a vital role in the attainment and implementation of ADHD treatments. It is argued that the focus of future ADHD interventions must embrace positive parental cognitions and parental support, rather than focusing predominantly on child-centric interventions.

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## Appendix A

## Parent Demographic Variables

Variable	Descriptive
<u>Categorical Variables</u>	
Primary Carer for the Child	Yes – 178(84.8%); No – 6 (2.9%); N/A – 25 (11.9%); Not Reported – 1 (0.5%).
Relationship with Child	Biological Mother – 159 (75.7%); Biological Father – 13 (6.2%); Step Mother/Foster Mother – 13 (6.2%); Step Father/Foster Father – 0 (0%); Other – 2 (1%); Not Reported – 23 (11.0%).
Child(ren) with ADHD	Yes – 135 (64.3%); No – 74 (35.2%); Not Reported – 1 (0.5%).
Number of Children with ADHD	Zero – 81 (38.8); One – 105 (50.2%); Two – 22 (10.5%); Three – 1 (0.5%).
Education Level	Year 12 Not Completed – 6 (2.9%); Year 12 Completed – 32 (15.2%); Vocational degree/TAFE – 28 (13.3%); Diploma – 16 (7.6%); Bachelor Degree – 53 (25.2%); Postgraduate Degree – 46 (21.9%); Other – 11

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	(5.2%); Not Reported – 18 (8.6%).
Marital Status	Married/Partner – 133 (63.3%); De Facto – 27 (12.9%); Separated/Divorced – 18 (8.6%); Widowed – 2 (1%); Single – 9 (4.3%); Not Reported – 20 (9.5%).
Living Arrangements	Married Living Together – 131 (62.4%); Married Living Apart – 6 (2.9%); De Facto Living Together – 25 (11.9%); De Facto Living Apart – 3 (1.4%); Single – 26 (12.4%); Not Reported – 19 (9.0%).
Employment Status	Full time – 65 (31.0%); Part-Time – 61 (29.0%); Not Employed – 60 (28.6%); Not Reported – 24 (11.4%).
Total Annual Income (personal)	\$0-19,999 – 43 (20.5%); \$20-49,999 – 68 (32.4%); \$50-79,999 – 30 (14.3%); \$80,000+ - 38 (18.1%); N/A – 10 (4.8%); Not reported – 21 (10.0%).
Total Annual Income	\$0-19,999 – 7 (3.3%); \$20-49,999 – 33 (15.7%);

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(household)	\$50-79,999 – 42 (20.0%); \$80-120,000 - 52 (24.8%); \$120,000+ – 49 (23.3%); Not reported– 27 (12.9%).	
Diagnosed Medical Condition	Yes – 120 (57.1%); No – 89 (42.4%); Not reported – 1 (0.5%).	
Currently Receiving Treatment	Yes – 83 (39.5%); No – 99 (47.1%); Not reported – 28 (13.3%).	
<u>Continuous variables</u>	<i>M</i>	<i>SD</i>
Variable		
Parent Age	41.00	8.89
Number of People	4.28	1.21
Living in Household		
Number of Children	2.24	1.14
Living in Household		
Number of Children	1.19	0.41
with ADHD		

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## Appendix B

## Child Demographic Variables

Variable	Descriptive
<u>Categorical Variables:</u>	
Child Sex	Female - 64 (30.5%); Male – 122 (58.0%); Not Reported – 24 (11.5%).
Birth Order	Oldest – 63 (30%); Middle – 31 (14.8%); Youngest – 60 (28.6%); Only child – 34 (28.6%); Not reported – 22 (10.5%).
Type of Schooling	Mainstream School – 155 (73.8%); Special Needs Day School – 9 (4.3%); Full-time Home Care – 3 (1.4%); Not reported– 21 (10.0%).
Formal Diagnosis of ADHD	Yes – 123 (58.9%); No – 5 (2.4%); Not reported – 81 (38.8).
<u>Continuous variables:</u>	
	<i>M</i> <i>SD</i>
Child age (Years)	9.12      3.62

## Appendix C

## Demographic Questions About the Parent

Question:	Response options:
Does your child have a mental health or physical health condition?	Yes; No
Do you have a child with Attention-Deficit/Hyperactivity Disorder (ADHD)?	Yes; No
What is your year of birth?	Open 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?	Open response
How many children, under the age of 18, currently live in your house?	Open response
How many of your children have ADHD?	Open response

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Has the child you are reporting been given a formal diagnosis of ADHD by a health care provider (i.e. physician, psychologist)?	Yes; No; No answer
What is your relationship status?	Married; De Facto; Separated/Divorced; Widowed; Single; Other
What are your living arrangements?	Married couple living together; Married couple living apart; De Facto couple living together; De Facto couple living apart; Single; 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; Over \$80,000; Not applicable.
What is your total household income, before taxes?	\$0-19,999; \$20-49,999; \$50-79,999; \$80-120,000; Over \$120,000
Have you ever received a diagnosis of, or	Anxiety; Depression; Bipolar Disorder;

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ever been treated for, any of the following? Anorexia; Bulimia; Schizophrenia; Social  
Phobia; Asperger's Syndrome; Autism;  
ADHD; Other (please state).

Do you have any current diagnosed Yes; No  
medical conditions for which you are  
receiving treatment?

If yes, what medical conditions are you Open response  
currently seeking treatment for?

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## Appendix D

## Demographic Questions about the Child

Question:	Response options:
How old is your child	Number of years and months.
What sex is your child?	Male; Female
Is your child an oldest, middle, youngest or only child?	Oldest; Middle; Youngest; Only
What kind of school does your child attend?	Mainstream school; Special needs day school; Special needs boarding school; Full-time home care; Institutional/Hospital care; Other (please state).
When at home, are you the primary carer for your child?	Yes; No; No answer
What is your relationship with your child?	Biological Mother; Biological Father; Step Mother; Step Father; Foster Mother; Foster Father; Other (please state).
Has the child for which you are reporting on	Oppositional Defiant Disorder; Anxiety;

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received a diagnosis, now, or in the past, of  
any of the following?

Depression; Bipolar Disorder; Learning  
Disorder; Conduct Disorder; Anorexia;  
Bulimia; Schizophrenia; Asperger's  
Syndrome; Other (please state).

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## 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 F

## Advertising Flyer 1

## **Are you a parent? Do you have a child aged between 4 and 17?**

### **How can you help?**

We want to examine the factors associated with parental distress in parents of children with ADHD and Down syndrome. Your participation could help us predict parental distress in parents of children with ADHD and Down syndrome, which could inform treatment interventions.

We are looking for parents of children with ADHD, Down syndrome AND parents of children with no disability.



### **Interested?**

Scan the QR code on your phone or follow the link to complete our online survey: <https://tinyurl.com/y8dkx9a7>.

The survey should take around 45-60 minutes.

Participants also go in the draw to win one of eight \$50 Coles-Myer vouchers.

Scan the QR code by opening your smartphone's camera app and holding the camera over the QR code.

No need to hit the shutter button – your device will automatically recognize the code and take you to our survey.

Student researchers: Johanna Van Der Hek ([jvander@utas.edu.au](mailto:jvander@utas.edu.au)) and Sarah Scott ([slscott0@utas.edu.au](mailto:slscott0@utas.edu.au)). Ethics Approval number: H0017272



## Appendix G

## Advertising Flyer 2



## ARE YOU A PARENT? DO YOU HAVE A CHILD AGED BETWEEN 4 AND 17?

### INTERESTED?

- Scan the QR code on your phone or follow the link to complete the online survey
- The survey should take around 45-60 minutes
- Participants also go in the draw to win 1 of 8 \$50 Coles-Myer vouchers



### HOW CAN YOU HELP?

Your participation in this survey could help us predict parental distress in parents of children with ADHD or Down Syndrome, which could inform treatment interventions.

We are looking for parents of children with ADHD or Down Syndrome AND parents of children with no disability.

<https://tinyurl.com/y8dkx9a7>

Student researchers: Sarah Scott  
(slscott0@utas.edu.au)  
and Johanna Van Der Hek  
(jvander@utas.edu.au)  
Ethics Approval number: H0017272

## Appendix H

### Information Sheet



*Participant Information Sheet V.01, / /17*

#### **TESTING A MODEL PREDICTING DEPRESSION, ANXIETY AND STRESS IN PARENTS OF CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER AND DOWNS SYNDROME**

##### **Invitation:**

You are invited to participate in a research study examining the factors predicting depression, anxiety and stress in parents of children with Attention-Deficit/Hyperactivity Disorder (ADHD) and Down syndrome. 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 Sarah Scott and Johanna Van Der Hek as part of the requirements for the Honours Psychology Program at the University of Tasmania, under the supervision of Dr Kimberley Norris.

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 the study?**

The purpose of this study is to examine the factors that predict depression, anxiety and stress in the parents of children with ADHD and Down syndrome. Furthermore, we aim to provide validation for a model of general parental distress.

##### **2. Why have I been invited to participate?**

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

##### **3. 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.

Your participation is entirely voluntary, and you may discontinue your participation at any time prior to the submission of the questionnaire. 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.

##### **4. 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.



*Participant Information Sheet V.01, / /17*

This study may also give parents the opportunity to contribute to the scientific understanding of ADHD and Down 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 ADHD, Down syndrome, 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 with ADHD or Down syndrome.

Additionally, participants in this study may choose to go into the draw to win one of eight \$50 Coles-Myer vouchers as thanks for their participation.

#### **5. 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 Dr Kimberley Norris on the phone number or email address at the bottom of this document, or engage with other support services such as Lifeline (13 11 14) or Beyond Blue (1300 22 4636).

If you have any concerns or questions about the study, please feel free to contact Dr Kimberley Norris.

#### **6. How will my confidentiality be protected?**

As previously mentioned, data will be entirely non-identifiable and will only be accessible to the researchers. Raw data will be destroyed after five years.

#### **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 information when this study is over?**

The data from this study will be stored for five years on a secure computer. Data will be destroyed after five years.

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

Preliminary results will be available in December 2018. 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 below.



*Participant Information Sheet V.01, / /17*

#### **10. What if I have questions about this study?**

If you have questions about the study, feel free to contact student researchers Sarah Scott or Johanna Van Der Hek, or Chief investigator Dr Kimberley Norris.

#### **Contact details:**

- Student Researchers: Sarah Scott ([sjscott0@utas.edu.au](mailto:sjscott0@utas.edu.au))  
Johanna Van Der Hek ([jvander@utas.edu.au](mailto:jvander@utas.edu.au))
- Chief Investigator: Kimberley Norris ([Kimbeley.norris@utas.edu.au](mailto:Kimbeley.norris@utas.edu.au)) or 6226 7199).

This study has been approved by the Tasmanian Social Sciences Human Research Ethics Committee. If you have any concerns or complaints regarding the conduct of this study, please contact the executive officer of the HREC (Tasmania) Network on +61 3 6266 6254 or email [human.ethics@utas.edu.au](mailto:human.ethics@utas.edu.au). The Executive Officer is the person nominated to receive complaints from research participants. Please quote ethics reference number: [H0017272](#).

**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 I

### Ethics Approval Letter

Social Science Ethics Officer  
Private Bag 01 Hobart  
Tasmania 7001 Australia  
Tel: (03) 6226 2763  
Fax: (03) 6226 7148  
Katherine.Shaw@utas.edu.au




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HUMAN RESEARCH ETHICS COMMITTEE (TASMANIA) NETWORK

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09 May 2018

Dr Kimberley Norris  
Psychology  
Private Bag 30

Dear Dr Norris

Re: FULL ETHICS APPLICATION APPROVAL

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

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We are pleased to advise that the Tasmania Social Sciences Human Research Ethics Committee approved the above project on 09 May 2018.

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 approval of other bodies or authorities is required. It is recommended that the proposed research should not commence until you have satisfied these requirements.

Please note that this approval is for four years and is conditional upon receipt of an annual Progress Report. Ethics approval for this project will lapse if a Progress Report is not submitted.

The following conditions apply to this approval. Failure to abide by these conditions may result in suspension or discontinuation of approval.

1. It is the responsibility of the Chief Investigator to ensure that all investigators are aware of the terms of approval, to ensure the project is conducted as approved by the Ethics Committee, and to notify the Committee if any investigators are added to, or cease involvement with, the project.
2. Complaints: If any complaints are received or ethical issues arise during the course of the project, investigators should advise the Executive Officer of the Ethics Committee on 03 6226 7479 or [human.ethics@utas.edu.au](mailto:human.ethics@utas.edu.au).

A PARTNERSHIP PROGRAM IN CONJUNCTION WITH THE DEPARTMENT OF HEALTH AND HUMAN SERVICES

3. Incidents or adverse effects: Investigators should notify the Ethics Committee immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
4. Amendments to Project: Modifications to the project must not proceed until approval is obtained from the Ethics Committee. Please submit an Amendment Form (available on our website) to notify the Ethics Committee of the proposed modifications.
5. Annual Report: Continued approval for this project is dependent on the submission of a Progress Report by the anniversary date of your approval. You will be sent a courtesy reminder closer to this date. **Failure to submit a Progress Report will mean that ethics approval for this project will lapse.**
6. Final Report: A Final Report and a copy of any published material arising from the project, either in full or abstract, must be provided at the end of the project.

Yours sincerely

Jude Vienna-Hallam  
Acting Executive Officer  
Tasmania Social Sciences HREC

