

Parents' causal attributions about attention deficit/hyperactivity disorder: the effect of child and parent sex

Katerina Maniadaki,* Edmund Sonuga-Barke* and Efthymios Kakouros†

*Developmental Brain & Behaviour Unit, School of Psychology, University of Southampton, Southampton, UK

†Department of Early Childhood Education, Technological Educational Institution of Athens, Athens, Greece

Abstract

Background Boys with attention deficit/hyperactivity disorder (AD/HD) demonstrate disruptive behaviour at significantly higher rates compared to girls. Disruptive behaviour often develops as a result of negative interaction patterns within the caregiving relationship. Given the importance of parental cognitions as mediators of parental behaviour, the consideration of parent and child sex in the investigation of causal attributions regarding AD/HD may, at least partially, explain sex differences in the prevalence of disruptive behaviour among children with AD/HD.

Aim To examine the effect of parent and child sex on parental causal attributions and reactions about AD/HD and to investigate the interrelationships between these variables.

Sample Three hundred and seventeen mothers and 317 fathers of boys and girls aged 4–6 years and enrolled in kindergartens in Athens.

Method A Greek version of the Parental Account of the Causes of Childhood Problems Questionnaire was used, which followed a vignette about a hypothetical child displaying symptoms of AD/HD. Half of the participants received a male and another half received a female version of the vignette.

Results The child's sex greatly influenced parents' causal attributions about AD/HD. Higher ratings of intentionality were conferred to boys with AD/HD than girls and these attributions were related to stricter responses towards boys. In contrast, parents who considered biological dysfunction as underlying AD/HD, they mostly did so in the case of girls. Minimal effect of parent sex on causal attributions was found.

Conclusions Because causal attributions of intentionality relate to the response of more strictness and such attributions are more prevalent for boys than girls, then these perceptions about the aetiology of AD/HD in boys may be at the basis of negative interaction patterns. The increase of such interaction patterns may place boys at a more vulnerable position towards the development of secondary behaviour problems.

Keywords

AD/HD, causal attributions, perceptions, preschoolers, sex differences

Introduction

Attention deficit/hyperactivity disorder (AD/HD) is a developmental disorder with neurobiological foundations. It has an onset in early childhood, is cross-situational and is persistent over time. Chil-

dren with AD/HD present significant problems with attention, impulsiveness and over-activity (Barkley 1990).

In recent years, there is an increasing research interest in understanding sex differences in the expression of AD/HD in boys and girls. The most

Correspondence:
Katerina Maniadaki, 52
Karatasou str., 136 76
Thrakomakedones, Athens,
Greece
E-mail: katerina@arsi.gr

consistent difference identified is that boys with AD/HD demonstrate disruptive behaviours more frequently and display higher ratings of aggression and co-morbid conduct disorder compared with girls with AD/HD (Faraone *et al.* 1991; Biederman *et al.* 1999). There is substantial likelihood that part of the higher referral rates of boys with AD/HD than girls to Child Mental Health Services is owing to their higher rates of associated disruptive behaviour (Kakouros *et al.* 1996; Gaub & Carlson 1997).

A number of clinically based studies have identified the relationship between parent-child interaction patterns and the development of disruptive behaviour in children with AD/HD (Barkley *et al.* 1989; Jensen *et al.* 1997; Ingram *et al.* 1999). Three parenting processes have been revealed as particularly relevant to the development of conduct problems. First, cycles of negative reinforcement are often developed between parents and children with AD/HD, when child non-compliance is reinforced by the parent giving in (Patterson 1986). Second, harsh parenting, including the use of over-reactive, inconsistent and punitive disciplinary methods, has been identified as a risk factor. Mothers of children with AD/HD have been reported as more directive, more negative and less responsive to child-initiated interactions (Barkley *et al.* 1985; Stormshak *et al.* 2000). Third, proactive parenting, that might prevent conduct problems from emerging, is rare within the relationship with a child with AD/HD (Barkley *et al.* 1985). Any of the above-mentioned parenting processes may predict the early emergence (Shaw *et al.* 1994; Shaw *et al.* 1998) and longer term stability of both disruptive behaviour (Campbell 1994; Deater-Deckard *et al.* 1998) and AD/HD symptoms (August *et al.* 1998).

It has been suggested that the above interaction patterns may be differently associated with the development of disruptive behaviour in boys and girls (Rothbaum & Weisz 1994). For example, it has been revealed that the annoyance threshold for male deviance was less than that for female deviance. Mothers of boys with AD/HD were found to be critical, disapproving and severe in their punishment, whereas no correlation of these maternal behaviours was found with AD/HD behaviours in girls (Battle & Lacey 1972). Mothers of girls at risk

for AD/HD were found to give more rewards per positive behaviour than did mothers of boys at risk for AD/HD (Cunningham & Boyle 2002). Moreover, studies of normative samples have shown that physical punishment is used in general more often on boys than on girls, whereas girls are treated with more warmth and less aggression (Webster-Stratton 1996). Thus, it can be speculated that boys are more in danger to develop secondary behaviour problems on the basis of their primary AD/HD symptoms, owing to receiving more negative or/and less positive parenting, compared with girls.

On the basis of the above hypothesis, it becomes crucial to examine the factors that may lead to ineffective parenting in families of a child with AD/HD. Part of the negative parental responses towards children with AD/HD is probably elicited by the children's behaviour itself (Edwards *et al.* 1995). There is evidence that boys behave in a more aggressive and oppositional manner than girls do in a variety of situations (Maccoby & Jacklin 1974). It seems possible, then, that normative developmental characteristics of boys may put them in greater danger than girls for the manifestation of behaviours that usually trigger negative parental responses.

However, it has been suggested that parental responses are not elicited directly by child behaviours but are mediated by parental cognitions (Johnston & Mash 1989). It is proposed that causal attributions parents make regarding disruptive behaviours mediate the impact of these behaviours both on their immediate emotional and behavioural responses to the child and the long-term quality of family relationships (Sonuga-Barke & Balding 1993; Johnston & Patenaude 1994; Bugental *et al.* 1998).

Research with non-problem children has revealed that, in general, parents attribute negative behaviours to external, situational factors (Dix *et al.* 1986; Freeman *et al.* 1997). In contrast, parents of difficult children often attribute misbehaviour to the child's negative personality and dispositions and hold the child responsible for the misbehaviour (Baden & Howe 1992). According to Weiner (1980), when behaviours are regarded as being under deliberate control, then responses are more likely to be negative. Indeed, it has been

shown that parental responses subsequent to attributions of intentionality and responsibility on behalf of the child are usually strong and punitive (Dix & Grusec 1985).

However, it is uncertain whether such causal attributions concern both sexes or differ between boys and girls. To date, reported studies have either focused almost exclusively on boys or included invariably both sexes in their sample, thus not permitting the investigation of possible sex differences. Moreover, existent studies have mainly used maternal ratings, whereas fathers' attributions are rather unexplored yet. The investigation of these factors seem important as the ways parents explain the causes of, and respond to their children's social behaviour involve, among others, a complex interaction of child and parent sex (Cote & Azar 1997).

Within this framework, the purposes of this study were: (i) to explore the effect of child and parent sex on parental causal attributions and recommended reactions about behaviours reflecting primary AD/HD symptoms, and (ii) to investigate the interrelationships between the above variables. Given the higher prevalence of disruptive behaviour in boys with AD/HD than girls, and the fact that such behaviour may relate to harsh parenting practices, higher ratings of intentionality are expected for boys presenting behaviours reflecting primary AD/HD symptoms. Ratings of intentionality are predicted to relate to stricter responses that are expected towards males than females.

Method

Participants

The sample consisted of 634 parents (317 mothers and 317 fathers) of boys and girls aged 4–6 years and enrolled in kindergartens in Athens. Only data from cases where both a child's parents filled in the questionnaires were considered for analysis. Parents' mean age was 34.8 years, with a standard deviation (SD) of 4.88 years. The educational level of the parents participating in the study was relatively high, as 48.7% had graduated from college or university and 34.9% had graduated from high school.

Measures

An analogue methodology, using a written description of child behaviour, was used. The vignette presented the major symptoms of AD/HD, combined type as described in the DSM-IV (APA 1994), displayed by a 5-year old child, either boy or girl. Nine major symptoms of inattention ('easily distracted', 'fails to finish activities', 'does not seem to listen when spoken to directly'), hyperactivity ('runs and climbs all the time', 'often leaves seat', 'often fidgets'), and impulsivity ('interrupts others', 'difficulty awaiting turn', 'blurts out answers') were included in the vignette.

The vignette was followed by 36 statements, rated on a Likert type 5-point scale and grouped into two sections. These statements evolved in part from a review of the literature and in part from clinical observation. All statements were scored in the same direction from 1 to 5 with 1 assigned to 'very unlikely/strongly disagree', 3 assigned to 'no opinion', and 5 assigned to 'very likely/strongly agree'. These covered:

- 1 Twenty-five ratings of likely causes of the behaviour described in the vignette. These ratings were adapted from 'The Parental Account of the Causes of Childhood Problems Questionnaire' (PACCP; Sonuga-Barke & Balding 1993), designed to examine the structure and associations of adult attributions of common childhood problems. Attributions ranged from biological through environmental factors.
- 2 Eleven ratings of actions that the child's parents should undertake in order to help him or her. Sample questions are: 'To try and control John's behaviour, his parents should help him with his schoolwork or leave him alone or change his diet', etc.

Procedure

Mothers and fathers were given two identical questionnaires by the nursery teacher of their child and they were asked to fill them in at home. A between-subjects design was used. Half of the parents received a vignette about a girl and another half

received a vignette about a boy. In each classroom only questionnaires of one version were administered. A letter accompanied the questionnaire, explaining the purposes of the research, assuring the participants that personal information would not be released and results of this study would not include any identifying characteristics. The questionnaires were then collected by the nursery teacher and handed in to the researcher. Twenty-five nursery schools in Athens participated in the study.

Results

Two thousand questionnaires were administered to parents, and 634, completed by both parents, were collected (approximately 25% response rate). The greatest difficulty encountered was the unwillingness of fathers to participate. Unfortunately, owing to the procedure that ensured the anonymity of the participants, no information was available regarding either the causes of non-response or potential differences between responders and non-responders.

Causal attributions

The associations between the 25 ratings of likely causes of AD/HD were examined using a principal component analysis, with an orthogonal rotation to varimax solution, separately for mothers and fathers. Similar factor structures were revealed, so the results of the analysis performed on the whole sample are presented below. Factor analysis provided five factors, accounting for 48.06% of the variance (Table 1). The first factor related to parental absence, the second one to child's intentional behaviour (although the items 'lack of discipline' and 'spoilt child' refer more to ineffective parenting), the third one to biological cause, the fourth factor referred to parental indifference/ineffectiveness, and the last factor related to difficult life circumstances. Item scores loading on each factor were then combined to produce one value for each one of the five factors. Cronbach's alpha coefficients were also calculated for each factor with the following results: 1-alpha = 0.83 for parental absence, 2-alpha = 0.70 for child's intentional behaviour, 3-alpha = 0.67 for biological cause, 4-

Table 1. Principal component analysis of causal attributions about AD/HD

Item	Factor: Percent variance:	1 12.68	2 9.60	3 9.46	4 8.79	5 7.52
Mother's death		0.81				
Father's death		0.79				
Divorced parents		0.76				
Single-parent family		0.74				
Recent bereavement		0.67				
Child's enjoyment			0.67			
Lack of discipline			0.67			
Attention seeking			0.72			
Spoilt child			0.74			
Purposeful behaviour			0.50			
Mental sub-normality				0.79		
Premature birth				0.72		
Mild brain damage				0.83		
Indifferent parents					0.71	
Strict parents					0.57	
Unloving parents					0.76	
Can't help it					-0.45	
By nature					-0.52	
Strict school						0.71
Deafness						0.55
Inner city area						0.60
Working mother						0.45

Factor loadings with absolute values less than 0.45 are not reported.

Table 2. Fathers' and mothers' causal attributions about AD/HD in boys and girls

Causal attributions	Parents' sex	Boys (n = 230)		Girls (n = 404)		Total (n = 634)	
		Mean	SD	Mean	SD	Mean	SD
Parental absence	Fathers	3.14	0.89	3.26	0.86	3.22	0.87
	Mothers	3.33	0.85	3.40	0.83	3.38	0.84
	Total	3.24	0.87	3.33	0.85	3.30	0.86
Child spoilt behaviour	Fathers	3.71	0.71	3.53	0.76	3.60	0.75
	Mothers	3.68	0.83	3.66	0.80	3.67	0.81
	Total	3.70	0.77	3.59	0.79	3.63	0.78
Biological cause	Fathers	2.26	0.88	2.56	0.95	2.45	0.94
	Mothers	2.30	0.93	2.57	1.00	2.47	0.98
	Total	2.28	0.90	2.57	0.98	2.46	0.96
Parental indifference/ineffectiveness	Fathers	3.65	0.97	3.56	0.95	3.60	0.96
	Mothers	3.76	0.90	3.71	0.92	3.73	0.91
	Total	3.71	0.94	3.63	0.94	3.66	0.94
Difficult life circumstances	Fathers	2.75	0.77	2.49	0.76	2.58	0.77
	Mothers	2.67	0.87	2.50	0.79	2.56	0.82
	Total	2.71	0.82	2.50	0.77	2.57	0.80

SD, standard deviation.

Higher ratings indicate factors are judged more likely to be causal.

alpha = 0.73 for parental indifference/ineffectiveness and 5-alpha = 0.65 for difficult life circumstances.

In general, parental indifference/ineffectiveness and child's intentional behaviour received the strongest positive ratings ($M = 3.66$, $SD = 0.94$, and $M = 3.63$, $SD = 0.78$ respectively), parental absence received moderate ratings ($M = 3.30$, $SD = 0.86$) and difficult circumstances and biological cause received ratings ranging from neutral to negative ($M = 2.57$, $SD = 0.80$, and $M = 2.46$, $SD = 0.96$ respectively). A similar hierarchy of causal attributions was found for boys and girls.

The effect of the independent variables (child and parent sex) and their interactions on causal attributions was examined. Five multifactorial ANOVAs were carried out, using each one of the five causal factors as the dependent variable, separately, in each one of the five analyses (Table 2). Where P -values reached statistical significance, *post hoc* analyses were performed.

A significant parent sex effect was found for the causal factor related to 'parental absence' [$F(1609) = 5.10$, $P < 0.05$], with mothers being more likely than fathers to attribute the behaviours presented in the vignette to this factor. Significant child sex effects were obtained for the causal factors related to 'difficult life circumstances' [$F(1613) = 10.15$, $P < 0.01$] and 'child's intentional

behaviour' [$F(1613) = 6.12$, $P < 0.05$], with boys getting significantly higher ratings than girls. A significant child sex effect was found regarding the causal factor related to 'biological cause' [$F(1599) = 12.63$, $P < 0.00$], with girls receiving significantly higher ratings than boys. It seems that, when parents considered biological deficits as underlying behaviours reflecting primary AD/HD symptoms, they did it more often in the case of girls. Finally, no significant effects of any of the independent variables were demonstrated on the causal factor related to 'parental indifference/ineffectiveness'.

Parental responses

A factor analysis using varimax rotation was performed on the 10 items regarding recommended parental responses to behaviours reflecting primary AD/HD symptoms. Four factors were extracted, accounting for 52.51% of the variance (Table 3). The items loaded on the first factor reflected a tendency to approach the child; the items loaded on the second factor reflected a tendency to change the child's environment; the third factor referred to more strictness and the fourth factor referred to reduced control. Item scores loading on each factor were then combined to produce one value for each one of the four factors.

Table 3. Principal component analysis of perceptions about recommended parental responses towards boys and girls with AD/HD

Item	Factor:	1	2	3	4
	Percent variance:	15.60	13.70	12.00	11.22
Show more love		0.65			
Try and work it out		0.65			
Ask why he or she is unhappy		0.77			
Help with schoolwork			0.58		
Move school			0.50		
Change diet			0.65		
New friends			0.55		
Stop watching TV				0.62	
Stop spoiling him or her				0.76	
Leave alone					0.75
Less strict at home					0.68

Factor loadings with absolute values less than 0.40 are not reported.

Table 4. Fathers' and mothers' ratings of recommended parental responses towards boys and girls with AD/HD

Recommended parental responses	Parents' sex	Boys (n = 230)		Girls (n = 404)		Total (n = 634)	
		Mean	SD	Mean	SD	Mean	SD
Approach	Fathers	4.12	0.71	4.17	0.65	4.15	0.67
	Mothers	4.36	0.59	4.27	0.64	4.30	0.62
	Total	4.24	0.66	4.22	0.65	4.23	0.65
Change environment	Fathers	2.97	0.61	2.91	0.63	2.93	0.62
	Mothers	3.14	0.59	3.01	0.64	3.06	0.62
	Total	3.06	0.61	2.96	0.63	2.99	0.63
Strictness	Fathers	3.51	0.75	3.18	0.78	3.30	0.79
	Mothers	3.43	0.81	3.14	0.77	3.24	0.80
	Total	3.47	0.78	3.16	0.78	3.27	0.79
Reduced control	Fathers	2.63	0.73	2.60	0.72	2.61	0.73
	Mothers	2.60	0.80	2.60	0.74	2.60	0.76
	Total	2.61	0.77	2.60	0.73	2.61	0.74

SD, standard deviation.

Higher ratings indicate the parental reaction is more likely to be recommended.

Cronbach's alpha coefficients were also calculated for each factor with the following results: 1-alpha = 0.64 for approach, 2-alpha = 0.62 for change, 3-alpha = 0.79 for strictness and 4-alpha = 0.87 for reduced control.

Approach of the child was the most recommended parental response ($M = 4.23$, $SD = 0.65$), with more strictness being the second response of choice ($M = 3.33$, $SD = 0.79$). Change and reduced control received neutral ratings ($M = 2.99$, $SD = 0.63$, and $M = 2.61$, $SD = 0.74$ respectively).

Four multifactorial ANOVAs were carried out, using each one of the four factors revealed by the above factor analysis as the dependent variable,

separately, in each one of the four analyses (Table 4). There were significant parent sex effects on the factors 'approach the child' [$F(1629) = 10.45$, $P = 0.001$] and 'change the environment' [$F(1566) = 4.05$, $P < 0.05$], with mothers giving higher ratings than fathers. A significant child sex effect was obtained for 'more strictness' [$F(1615) = 22.72$, $P = 0.000$]. Results showed that significantly higher ratings on this factor were given to boys than girls. It seems that, when increased strictness was the response of choice, this mostly applied in the case of boys. Finally, it had not been found any significant effects of the independent variables in relation to the 'reduced control' factor.

Table 5. Correlation between causal attributions and recommended parental responses towards boys and girls with AD/HD

	Parental absence		Child's fault		Biological cause		Parental fault		Difficult circumstances	
	B	G	B	G	B	G	B	G	B	G
Approach	0.33*	0.15*	0.05	0.13	0.10	-0.11	0.25*	0.44*	0.16	0.17*
Change	0.20*	0.13*	0.16	-0.06	0.25*	-0.02	0.07	-0.07	0.28*	0.25*
More strict	0.13	0.02	0.28*	0.21*	0.00	-0.07	0.06	-0.02	0.23*	0.15*
Less strict	0.08	-0.03	-0.07	0.01	0.02	0.03	0.13	0.03	0.09	0.17*

B, Boys; G, Girls.

Alpha corrected for multiple tests following a Bonferroni Test.

* $P < 0.01$.

The relationship between causal attributions and parental responses

In order to investigate how causal attributions about behaviours reflecting primary AD/HD symptoms and recommended parental responses were related to each other, a series of correlational analyses were performed (Table 5). It was found that causal attributions of parental absence were positively correlated with the tendency: (i) to approach both boys and girls and (ii) to make changes in their environment. Moreover, causal attributions of child's intentional behaviour were positively correlated with the response of more strictness towards both boys and girls, whereas causal attributions of parental indifference/ineffectiveness were positively correlated with the response of approach for both boys and girls. Causal attributions of biological cause were positively correlated with change in the case of boys. Finally, causal attributions of difficult life circumstances were positively correlated with: (i) all four proposed responses for girls and (ii) change of the child's environment and more strictness for boys. However, after having performed the Fischer's Exact Test, the differences, which are in correlation between causal attributions of difficult life circumstances and the responses of approach and reduced control for boys and girls, were revealed to be non-significant.

Discussion

The aim of this study was to investigate the effect of child and parent sex on parental causal attributions and recommended reactions about child

behaviours reflecting primary AD/HD symptoms and to examine the interrelationships between these factors. The basic hypotheses tested were that higher ratings of intentionality would be conferred to boys than girls, that such attributions would be related to stricter responses and that stricter responses would be preferred for boys.

In general, both mothers and fathers gave strong positive ratings to parental indifference/ineffectiveness and child's intentional behaviour as likely causes of behaviours reflecting primary AD/HD symptoms whereas biological abnormalities were given low ratings. This finding is consistent with earlier studies that have shown that mothers of children with AD/HD are more likely to perceive their children's misbehaviour as intentional, and to expect that parental attempts to influence misbehaviour will be ineffective (Barkley 1990; Harrison & Sofronoff 2002).

As expected, the sex of the child was found to influence, to a certain degree, parents' causal attributions about behaviours reflecting primary AD/HD symptoms. More specifically, parents who perceived intentionality in the child's problem behaviour or environmental influences mostly did so in the case of boys. Conversely, parental attributions of biological causes, as underlying behaviours reflecting primary AD/HD symptoms, applied mostly in the case of girls. These findings are consistent with previous research that has shown that male AD/HD behaviours are perceived as more typical for boys and more untypical for girls (Maniadaki *et al.* 2003). It seems that boys' behaviours reflecting primary AD/HD symptoms can be more easily perceived as within the normal boundaries of male behaviour, and are therefore consid-

ered controllable by the child. In contrast, similar female behaviours, viewed as more untypical, can be more easily considered as a pathological condition with possible biological substrate.

Analyses regarding recommended parental reactions towards children displaying behaviours reflecting primary AD/HD symptoms showed that the approach of the child was the most likely recommended response and more strictness was the second response of choice. However, further analysis confirmed our prediction that more strictness would be mainly proposed in the case of boys. Greater strictness towards boys displaying behaviours reflecting primary AD/HD symptoms may be related both to causal attributions of intentionality, as shown earlier, and to parental perceptions of low self-efficacy to deal with these behaviours, when displayed by boys. It has been found that mothers perceive themselves as less efficacious to deal with boys with AD/HD than with girls presenting similar behaviour (Maniadaki *et al.* 2005). Thus, it can be speculated that when parents perceive a child's behaviour as intentional, they may feel less efficacious to confront with this behaviour, which might lead them to implement stricter parenting practices.

The close relationship between causal attributions and parental responses was revealed in this study. More specifically, attributions of parental absence or indifference were related to more cooperative responses, like discussion and affection, whereas attributions of child's intentional behaviour were related to stricter parenting strategies. These findings provide support for the view that the attributions parents make about the causes of their child's behaviour are likely to influence both their immediate behavioural responses toward the child and their general choice of parenting strategies as well (Dix *et al.* 1986; Johnston & Patenaude 1994).

It has been proposed that, when parents assume that the child's problems result from deliberate non-compliance rather than incompetence, they tend to respond negatively (Goldstein & Goldstein 1992). In this study, intentionality on behalf of the child and environmental influences were revealed as more frequent causal attributions for boys than girls. Those cases where the boys' problem behav-

our was perceived as intentional may account: (i) for the implementation of ineffective parenting strategies, mostly in the case of boys and (ii) for a proportion of the observed variance in the prevalence of conduct problems among boys and girls displaying AD/HD.

This point of view is reinforced by the findings of MacKinnon-Lewis and colleagues (2001), who showed that mothers' and sons' negative attributions about one another's intent were associated with the aggressiveness that each of them directed toward the other. In addition, previous studies suggest that early unresponsive or rejecting parenting may place boys at greater risks than girls for subsequent externalizing problems (Shaw *et al.* 1998). Of course, the transactional nature of the relationship between parenting and child problem behaviour should be acknowledged. Child characteristics and environmental influences exert reciprocal effects on each other, the combination of which influences later parent and child behaviour (Shaw *et al.* 1998).

The second variable examined was parent sex. Analyses revealed limited effect of this factor on parental attributions and recommended parental reactions. Mothers were more likely than fathers to attribute AD/HD to parental absence and to choose to approach the child with AD/HD or try to make changes in his or her environment. Therefore, fathers and mothers seem to share similar causal attributions and perceptions about pertinent parental responses regarding child AD/HD with only minor differences.

However, there are a number of limitations at the conclusions that can be drawn. First, this study shares in the weakness of all self-report studies. Participants' responses to vignettes might not disclose how they actually thought and might not represent their actual behaviour. In addition, participants responded to a limited amount of information regarding a limited sample of child behaviour and they were not told that these behaviours reflect a diagnosis of AD/HD. Thus, the attributions investigated cannot be considered as concerning the disorder of AD/HD *per se* but rather a range of behaviours reflecting primary AD/HD symptoms. Second, this study was restricted to correlational relationships that impose

obvious limitations in interpreting the direction of effects. In this study it is assumed that attributions are determinants of parenting behaviour. Although consistent with theory and empirical evidence from other studies, this conclusion cannot be drawn from our results. Finally, the low response rate of fathers may have biased the results regarding the representativeness of our sample.

In spite of methodological limitations, however, the findings of this study have direct implications for intervention programs implemented in families of children with AD/HD. Based on the above, the first step of clinical care becomes the management of parental attributions in order to increase the possibility of successful outcomes. Parents often need help to perceive the real causes of their children's disruptive behaviour and to distinguish unwillingness of the child to co-operate from incompetence to control impulsive behaviour. Professionals have the responsibility to foster developmentally helpful attributions and avoid maladaptive ones as they attempt to implement behavioural management techniques. (Wright *et al.* 2000).

References

- American Psychiatric Association (1994) *Diagnostic and Statistical Manual of Mental Disorders, (DSM-IV)*, 4th edn. American Psychiatric Association, Washington DC, USA.
- August, G. J., Braswell, L. & Thuras, P. (1998) Diagnostic stability of ADHD in a community sample of school aged children screened for disruptive behaviour. *Journal of Abnormal Child Psychology*, 26, 345–356.
- Baden, A. D. & Howe, G. W. (1992) Mothers' attributions and expectancies regarding their conduct-disordered children. *Journal of Abnormal Child Psychology*, 20, 467–485.
- Barkley, R. A. (1990) *Attention-Deficit/Hyperactivity Disorder: A Handbook for Diagnosis and Treatment*. Guilford Press, New York, NY, USA.
- Barkley, R. A., Karlsson, J. & Pollard, S. (1985) Effects of age on the mother-child interactions of hyperactive children. *Journal of Abnormal Child Psychology*, 13, 631–638.
- Barkley, R. A., McMurray, M. B., Edelbrock, C. S. & Robbins, K. (1989) The response of aggressive and nonaggressive ADHD children to two doses of methylphenidate. *Journal of the American Academy of Child and Adolescent Psychiatry*, 28, 199–204.
- Battle, E. & Lacey, B. A. (1972) Context for hyperactivity in children over time. *Child Development*, 43, 757–772.
- Biederman, J., Faraone, S. V., Mick, E., Williamson, S., Wilens, T. E., Spencer, T. J., Weber, W., Jetton, J., Kraus, I., Pert, J. & Zallen, B. (1999) Clinical correlates of ADHD in females: findings from a large group of girls ascertained from pediatric and psychiatric referral sources. *Journal of the American Academy of Child and Adolescent Psychiatry*, 38, 966–975.
- Bugental, D. B., Johnston, Ch, New, M. & Silvester, J. (1998) Measuring parental attributions: conceptual and methodological issues. *Journal of Family Psychology*, 12, 459–480.
- Campbell, S. B. (1994) Hard-to-manage preschoolers: externalizing behaviour, social competence, and family context at two-year-follow-up. *Journal of Abnormal Child Psychology*, 22, 147–166.
- Cote, L. R. & Azar, S. T. (1997) Child age, parent and child gender, and domain differences in parents' attributions and responses to children's outcomes. *Sex Roles*, 36, 23–50.
- Cunningham, C. E. & Boyle, M. H. (2002) Preschoolers at risk for attention deficit hyperactivity disorder and oppositional defiant disorder: family, parenting and behavioural correlates. *Journal of Abnormal Child Psychology*, 30, 555–569.
- Deater-Deckard, K., Dodge, K. A., Bates, J. A. & Pettit, G. S. (1998) Multiple risk factors in the development of behaviour problems: group and individual differences. *Development and Psychopathology*, 10, 469–493.
- Dix, T. & Grusec, J. E. (1985) Parental influence techniques: an attributional analysis. *Child Development*, 54, 645–652.
- Dix, T. H., Ruble, D. N., Grusec, J. E. & Nixon, S. (1986) Social cognition in parents: inferential and affective reactions to children of three age levels. *Child Development*, 57, 879–894.
- Edwards, M. C., Schulz, E. G. & Long, N. (1995) The role of the family in the assessment of attention deficit hyperactivity disorder. *Clinical Psychology Review*, 15, 375–394.
- Faraone, S. V., Biederman, J., Keenan, K. & Tsuang, M. T. (1991) A family-genetic study of girls with DSM-III attention deficit disorder. *American Journal of Psychiatry*, 148, 112–117.
- Freeman, W. S., Johnston, Ch & Barth, F. M. (1997) Parent attributions for inattentive-overactive, oppositional-defiant, and pro-social behaviors in children with attention deficit hyperactivity disorder. *Canadian Journal of Behavioural Science*, 29, 239–248.
- Gaub, M. & Carlson, C. L. (1997) Gender differences in ADHD: a meta-analysis and critical review. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 1036–1045.

- Goldstein, S. & Goldstein, M. (1992) *Hyperactivity: Why Won't My Child Pay Attention?*. Wiley, New York, NY, USA.
- Harrison, C. & Sofronoff, K. (2002) ADHD and parental psychological distress: role of demographics, child behavioral characteristics, and parental cognitions. *Journal of the American Academy of Child and Adolescent Psychiatry*, **41**, 703–711.
- Ingram, S., Hechtman, L. & Morgenstern, G. (1999) Outcome issues in ADHD: adolescent and adult long-term outcome. *Mental Retardation and Developmental Disabilities Research Reviews*, **5**, 243–250.
- Jensen, P. S. & Martin, D. & Cantwell, D. P. (1997) Comorbidity in ADHD: implications for research, practice, and DSM-IV. *Journal of the American Academy of Child and Adolescent Psychiatry*, **36**, 1065–1079.
- Johnston, Ch & Mash, E. (1989) A measure of parenting satisfaction and efficacy. *Journal of Clinical Child Psychology*, **18**, 167–175.
- Johnston, Ch & Patenaude, R. (1994) Parent attributions for inattentive-overactive and oppositional-defiant child behaviors. *Cognitive Therapy and Research*, **18**, 261–275.
- Kakouros, E., Tzima-Tsitsika, E., Tsitsika, A. & Balourdos, D. (1996) Children referred to a diagnostic – consulting center with special reference to specific learning disorder. *World Pediatrics and Child Care*, **6**, 44–49.
- Maccoby, E. E. & Jacklin, C. N. (1974) *The Psychology of Sex Differences*. Stanford University Press, Stanford, CA, USA.
- MacKinnon-Lewis, C., Lamb, M. E., Hattie, J. & Baradaran, L. P. (2001) A longitudinal examination of the associations between mothers' and sons' attributions and their aggression. *Development and Psychopathology*, **13**, 69–81.
- Maniadaki, K., Sonuga-Barke, E. & Kakouros, E. (2003) Trainee nursery teachers' perceptions of disruptive behaviour disorders; the effect of sex of child on judgements of typicality and severity. *Child: Care, Health and Development*, **29**, 433–440.
- Maniadaki, K., Sonuga-Barke, E., Kakouros, E., Karaba, R. (2005) Maternal emotions and self-efficacy beliefs in relation to boys and girls with AD/HD. *Child Psychiatry and Human Development*, **35**, 245–263.
- Patterson, G. R. (1986) Performance models for antisocial boys. *American Psychologist*, **41**, 432–444.
- Rothbaum, F. & Weisz, J. R. (1994) Parental caregiving and child externalizing behavior in nonclinic samples: a meta-analysis. *Psychological Bulletin*, **116**, 55–74.
- Shaw, D. S., Vondra, J. I., Hommerding, K. D., Keenan, K. & Dunn, M. (1994) Chronic family adversity and early child behavior problems: a longitudinal study of low income families. *Journal of Child Psychology and Psychiatry*, **35**, 1109–1122.
- Shaw, D. S., Winslow, E. B., Owens, E. B., Vondra, J. I., Cohn, J. F. & Bell, R. Q. (1998) The development of early externalizing problems among children from low-income families: a transformational perspective. *Journal of Abnormal Child Psychology*, **26**, 95–107.
- Sonuga-Barke, E. J. S. & Balding, J. (1993) British parents' beliefs about the causes of three forms of psychological disturbance. *Journal of Abnormal Child Psychology*, **21**, 367–376.
- Sonuga-Barke, E. J., Thompson, M. & Balding, J. (1993) Everyday beliefs about sources of advice for the parents of difficult children. *Child: Care, Health and Development*, **19**, 251–260.
- Stormshak, E. A., Bierman, K. L., McMahon, R. J. & Lengua, L. J. (2000) Parenting practices and child disruptive behaviour problems in early elementary school. *Journal of Clinical Child Psychology*, **29**, 17–29.
- Webster-Stratton, C. (1996) Early-onset conduct problems: does gender make a difference? *Journal of Consulting and Clinical Psychiatry*, **64**, 540–551.
- Weiner, B. (1980) A cognitive (attribution)-emotion-action model of motivated behaviour: an analysis of judgements of help-giving. *Journal of Personality and Social Psychology*, **39**, 186–200.
- Wright, B., Partridge, I. & Williams, C. (2000) Evidence and attribution: reflections upon the management of attention deficit hyperactivity disorder (ADHD). *Clinical Child Psychology and Psychiatry*, **5**, 626–636.