

MOTHERS' "ON-LINE" ATTRIBUTIONS AS PREDICTORS OF PARENTING
RESPONSE TO NONPROBLEM BOYS AND BOYS WITH ADHD BEHAVIOUR

by

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Abstract

Factors were examined that influence mother-child interactions and the choices that mothers make in deciding how to best respond to their children's behavior. A study was conducted employing a naturalistic think aloud method to assess mothers' attributions. The Study included 45 mothers of non-problem sons and 45 mothers of sons with Attention Deficit Hyperactive Disorder (ADHD). Sons ranged from 9 to 13 years of age. Mothers' instructed their sons to perform four separate task behaviors. Each mother was instructed to vocalize her thoughts as she watched her son engage in the task. At task completion, the mother was given an opportunity to provide feedback to her child regarding his task behavior. Each mother's think aloud comments were coded for descriptions of child behaviour and attributions regarding the cause of the child's behavior. In addition, the mothers' feedback comments were coded for quality of praise (Positive, Qualified, Criticism). In comparison to mothers of nonproblem sons, mothers of sons with ADHD were more likely to attribute child success to external factors. Moreover, mothers of sons with ADHD were generally more likely than mothers of nonproblem sons to attribute child failure to factors internal to the child. Hierarchical regressions were performed to examine the contributions of mothers' attributions to predicting feedback to the child above and beyond the contributions from group membership, descriptions of child behaviour and demographic variables. Results indicate that internal controllable stable attributions for success predict positive feedback. Discussion of results include limitations of method and possible improvements for future studies.

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This study was performed to understand the cognitions that are related to parents' behaviour in parent-child interactions. Research regarding the role of parent cognitions in parent-child interactions in general has been growing since the early 1980's (Goodnow, 1988; Sigel, McGillicuddy-Delsi, & Goodnow, 1992). In this study, mothers' attributions were the primary cognitive focus. Mothers' attributions are defined as causal explanations for child behaviour. An example of an attribution for child behaviour is when a child does not put away his shoes and the mother provides the following explanation (attribution) "because he is lazy." The content of attributions has been shown to relate to parent behaviour (Dix, Ruble, Grusec, & Nixon, 1986). For example, a parent's attribution of negative child behaviour to causes internal to the child and controllable by the child versus to causes external to the child and uncontrollable by him or her, have been shown to be related to the parent exhibiting negative reactions to the behaviour. Therefore, in the above example, attribution to laziness suggests that the cause of the behaviour is intentional and controllable by the child (versus an external attribution source, that for example, may be "I [the mother] forgot to tell him to put away his shoes") and the mother's expected reaction following this attribution would be negative.

This introduction will review literature in the following areas: parent attributions in parent-child interactions, differences in parent attributions across parents of children with Attention Deficit Hyperactive Disorder (ADHD) and parents of non-problem children, how parent attributions affect parenting behaviour, and methods for assessing parent attributions and behaviour.

Attributions in Parent/Child Interactions

Within the parent-child context, attributions have an ecological validity not often associated with other cognitions (Miller, 1995). For example, the parent-child relationship offers many opportunities for the generation of parent attributions, e.g., "why is my child misbehaving", "why is he getting poor reports from school". More specifically, it is possible that the length of the parent-child relationship and the emotional investment typical of this relationship help to generate attributions because mothers have the time and desire to develop knowledge regarding their child's general characteristics across contexts (e.g., school, home, play). Through a history of knowing how their child behaves in different contexts, mothers develop expectations as to how their children will behave and these expectations help to create attributions (Hewstone, 1989). For example, a mother notices her child performing a chore consistently; however, on one occasion the child does not perform the chore. On this occasion the mother may question why the child did not perform the chore and generate an attribution for the child's behaviour. Furthermore, mothers are, to a certain degree, concerned with controlling their child's behaviour, so they may be

especially prone to seeking explanations for unexpected or negative behaviours in order to facilitate changing the child's behaviour if desired. For these reasons it is important to examine parent attributions in the context of the parent-child interaction.

Models Discussing Parent Attributions, Child Behaviour, and Parent Reactions

Within parent-child interactions, child behaviour, parent cognitions, and parent affect and behaviour have been implicated as important variables that interact with each other (Miller, 1995). The suggested causal roles these variables take, however, vary with different models. For example, Dix's (1991) model emphasizes the role that parent affect has in regulating parent behaviour and cognition. In another model (Mills & Rubin, 1990), parental attributions take a causal role in that they are followed by affect which mediates further parent cognitions and behaviour. A model provided by Bugental and colleagues (1993) suggests that the relationship between child characteristics and parent responses is moderated by parent attributions. Although such models inform the ideas in this thesis, the present study did not seek to test any particular model nor to make claims regarding causal relations among these variables. Rather, this study assumed only that the variables are related.

Attribution and Behaviour Differences between Parents of Children with ADHD and Parents of Non-problem Children

Attention Deficit Hyperactive Disorder (ADHD) is a common psychiatric disorder with estimates suggesting it affects approximately 3-5% of the childhood population (American Psychiatric Association, 1994). Children with ADHD experience many problems including inattention, excessive fidgeting, excessive talking and impulsivity. Children with ADHD also suffer from social impairment (Milich & Landau, 1982) and an estimated 30 to 50 percent of children diagnosed with ADHD are comorbid for conduct and oppositional defiant disorder, and approximately 40 percent have a comorbid anxiety disorder (Biederman, Newcorn & Sprich, 1991). In addition, Parent-child interactions in families with children with ADHD, as compared to families with non-problem children, are more problematic (Johnston & Mash, in press). These difficult parent-child interactions in families with children with ADHD justify the examination of parent attributions in these families.

Past studies have compared both attributions for and responses to child behaviour between parents of children with ADHD and parents of nonproblem children. For example, using written descriptions of hypothetical child behaviours, as well as video-mediated and interview techniques to help the parent recall their own child's behaviour, Johnston and Freeman (1997) elicited parents' attributions and responses to ADHD, oppositional and prosocial child behaviours. Fifty two parents of children with ADHD and 42 parents of nonproblem children

participated. Of the three methods employed, both interview and the video-mediated recall indicated that parents of children with ADHD were more likely to attribute ADHD and oppositional child behaviours to internal causes than parents of nonproblem children. Furthermore, using the recalled incident interview method, parents of children with ADHD were more likely to attribute positive child behaviour to external sources than parents of nonproblem children. Results from the videotaped mediated recall and recalled incident interview methods indicated that parents of children with ADHD were more likely to attribute ADHD and oppositional behaviours to uncontrollable causes as compared to parents of nonproblem children. Furthermore, parents of children with ADHD rated both ADHD and oppositional behaviours as less controllable than prosocial behaviours. In contrast, at least in respect to written descriptions of child behaviour, parents of non-problem children rated ADHD, oppositional and prosocial behaviours as all equally controllable by the child. Both parents of children with ADHD and parents of non-problem children responded with most negative affect to the oppositional child behaviours and least negative to prosocial child behaviours, but there were few group differences in responses.

Johnston, Reynolds, Freeman and Geller (1998) reported on an extension of the Johnston and Freeman (1997) study, using a slightly expanded sample and focusing on an open-ended methodology for assessing attributions. Sixty one parents of children with ADHD and 49 parents of nonproblem children watched a video tape of themselves interacting with their child and were asked open-ended questions regarding what they were thinking when their children displayed inattentive, oppositional defiant or prosocial behaviours. Results indicated that both parents of children with ADHD and parents of nonproblem children made more internal, controllable, stable attributions for positive child behaviours than for negative. Furthermore, negative child behaviours were most often attributed to internal, uncontrollable, unstable causes.

In summary, parents of children with ADHD as compared to parents of nonproblem children are more likely to attribute negative child behaviour to causes within and uncontrollable by the child and are more likely to attribute positive child behaviour to causes external to the child. Therefore, the following predictions were made for this study: 1) that mothers of sons with ADHD would be more likely than mothers of nonproblem sons to attribute child success to external factors, and 2) more likely to attribute child failure to internal and uncontrollable causes within the child.

The Relationship of Parent Attributions to Parent Behaviour

The relationship between parent attributions for child behaviour and parent behaviour has been previously researched. Dix, Ruble, Grusec and Nixon (1984) reported on two studies that

included hypothetical vignettes illustrating child misconduct situations. The parents read the hypothetical vignettes and then rated the cause of the child's behaviour on various attribution dimensions including locus, control, and child's responsibility. Subsequent to providing attribution ratings, the parents rated how upset they would be if this was their child. These studies demonstrated that parent attributions of intentional, internal, and controllable causes for child misconduct behaviours were associated with the parent being more upset with the child. Further studies following Dix and Grusec's work (e.g., Dix & Lochman, 1990; Dix & Reinhold, 1991) also assessed attributions and parents' affective responses and behavioural responses to children's behaviour. Findings from these studies included that mothers were less upset with the child when attributing misbehaviour to poor parenting or some other external cause, and were more upset when children disobeyed their instructions immediately versus after a brief period of time. The mothers were more upset when children disobeyed immediately because they attributed the immediate disobedience to more intentional and controllable child dispositions.

A study by Hastings and Grusec (1998) focused upon the role that attributions have in mediating the relationship between parenting goals and parenting behaviour. Types of parenting goals included parent-child relationship centered, parent-centered and child-centered whereas types of parenting behaviour included power assertion (e.g., physical punishment, threaten, withdraw love), reasoning (e.g., question, reason, other oriented) and responsiveness (e.g., accept, comfort, praise). Results indicated that parent attributions of intentionality and disposition for child misbehaviour were mediators between parent-centered and child-centered goals and power assertive parenting.

Another study examining parents' attributions for child behaviour and parents' responses (Geller & Johnston, 1995a) included 100 mothers of nonproblem children. Mothers were asked to read written scenarios describing child behaviour failures (e.g., noncompliance) and to imagine themselves in the scenario with their son. Results indicated that mothers who rated their son's negative behaviour as more internal and controllable also experienced a more negative reaction to their son's behaviour. Stability attributions were not related to negative parent responses. A further study (Geller & Johnston, 1995b) examined the relationship between attributions and responses, as well as mothers' depressed mood and child conduct problems among 82 mothers of nonproblem children. Mothers read and then rated a written scenario describing negative child behaviour. Results indicated that attributions of the child behaviour to more internal and controllable causes were related to more negative parent responses. In addition, mothers' depressed mood was related to more attributions of child misbehaviour to internal and

controllable factors and child conduct problems were related to attributions of misbehaviour as global and stable in nature.

Similar relationships between attributions and behaviour have been found in parents of children with ADHD. Johnston and Patenaude (1994) in a sample of 43 parents of children with ADHD related parents' attributions and reactions. Written descriptions of inattentive and oppositional defiant child behaviours were used as the stimuli to elicit parent attributions and reactions. The findings revealed significant associations between parents' attributions of locus and control and parents' reactions. More specifically, for inattentive and oppositional defiant child behaviours, the more internal and controllable the child behaviour was perceived by the parent, the more negative the parent's reaction.

Finally, Johnston and Leung (2001) examined the association between parents' knowledge that a child with ADHD was receiving intervention (i.e., either medication, behavioural treatment, combination of medication and behavioural treatment, or no treatment) and parents' attributions for the child's compliant and noncompliant behaviour. Of most interest to the present study, the Johnston and Leung study also examined the relationship between the parents' attributions and their responses. Results indicated that for positive child behaviour, across all four treatment conditions, parents' attributions of more internal locus, more control, and more stability were generally associated with more positive parent reactions. However, for negative child behaviours, attributions were less consistently predictive of parent reactions. More specifically, for negative child behaviour results indicated that internal attributions were associated with more negative parent reactions, but the relationships between controllability and stability and parent reactions varied across the four treatment conditions.

In summary, for both parents of children with ADHD and parents of nonproblem children, parent attributions for negative child behaviour that are internal and controllable are related to a negative parent response. Studies differ with regards to the relationship between parents' attributions of stability and negative parent responses. Moreover, for both parents of children with ADHD, and nonproblem children parent attributions that are internal, controllable and stable for positive child behaviour are related to positive parent responses. Therefore, the predictions for this study were that for both mothers of sons with ADHD and mothers of nonproblem sons: 1) internal, controllable, stable attributions for child behaviour success would provide a unique contribution to predicting mothers' positive responses over and beyond mothers' descriptions of the child's success, and 2) internal, controllable, and stable attributions for child behaviour failure would provide a unique contribution to predicting criticism responses over and beyond mothers' descriptions of child failure.

Methods to Measure Attributions and Behaviour

In their review of attribution measurement issues, Bugental, Johnston, New, and Silvester (1998) discuss type of events, i.e., hypothetical versus real, for stimulating attributions.

Hypothetical events are defined as those where the parents are asked to imagine a possible scenario involving their child and to generate attributions, whereas with real events parents generate attributions for child behaviours that have actually occurred. Bugental and colleagues provide conceptual reasons for using either type of event. For example, the hypothetical method may be more suitable for obtaining parents' schematic representations of the parent-child relationship. It is suggested that parents can achieve more direct access to automatic schematic representations because the context is removed from hypothetical events. Real ongoing events, on the other hand, offer an opportunity for parents to provide cognitive appraisal processes that are effortful and dynamic. A think aloud methodology that taps on-going parent attributions for real child behaviours was used in this study because of an interest in assessing effortful cognitive processes and a belief in the importance of these processes in daily parent-child interactions.

In addition to differences in the stimuli used to generate parent attributions, the methods for measuring attributions also vary (Bugental, et al, 1998). The methods vary in terms of the degree of constraint on the parents' responses and the subject matter available to the parents. For example, with questionnaires, the parents are typically provided with brief scenarios or vignettes depicting child behaviours generated by the researchers, thus restricting the subject matter. Furthermore, the vignettes representing child behaviour, involving either an unknown child or the parent's child, may be presented in video form. A possible advantage in using a video vignette is that the visual image may provide a stronger stimulus to the parent to help generate attributions. On the other hand, a possible disadvantage in using a video vignette of unknown children is that the high level of event detail leaves little opportunity for the parent to imagine and structure the scenario more in line with a event that is more reflective of an interaction with their own child. This could lead the parent to place less emotional value in the event thereby limiting the validity of the generated attributions. The attributions also may be constrained because parents are prompted to provide ratings of attributions along pre-selected dimensions (e.g., locus, control). Researchers cannot tell if these attributions would have been generated naturally by the parent. However, a benefit of the use of standard stimuli and attributional ratings is that the attributions can be compared across parents.

While the two above methods, questionnaires and video stimuli followed by attributional ratings, constrain the subject matter of parents' attributions and attribution responses, the discourse method offers an opportunity for less constrained subject matter. The subject matter is

less constrained because this method uses a free-flowing dialogue context. For example, this method can be used in therapy situations where parents are involved in a dialogue with a therapist discussing their own child's behaviour. The transcripts from these sessions can be coded by the researchers for the various cognitions that parents verbalize. For explanations of two methods used to code such verbal transcripts see Schulmann, Castellon, and Seligman, (1989) and Stratton, Heard, Hanks, Munton, Brewin, and Davidson (1986). An advantage in using discourse methods is that the attributions are spontaneously generated by the parents in a social setting, thereby improving the external validity. The parents also may generate more attributions than with hypothetical stimuli because they are emotionally involved because the subject matter is based upon their observations of their child. A possible disadvantage to this method is that parents are generating their own subject matter from which the attributions are generated. It is difficult therefore to compare attributions across parents, as the subject matter for each parent may differ. For example, parent A may describe a violent child interaction and generate attributions from this interaction. However, parent B may describe a positive child interaction. Furthermore, because the attributions are not ratings, they need to be coded into categories and issues of the reliability and validity of this coding must be considered.

A variation of discourse methodology, the think aloud method of assessing attributions, was used in this study. For explanations of think aloud method approaches see Genest and Turk (1981) and Davison, Vogel, and Coffman (1997). In this study, the think aloud method accessed mothers' cognitions through their vocalizations as they observed their children. Mothers provided instructions to their child to perform four basic tasks. After each instruction, mothers observed their child and commented upon his behaviour while he performed the specific task. This follows the basic think aloud method whereby an individual is asked to verbalize all his/her thoughts via a continuous monologue while engaged in a task (Genest, & Turk, 1981). Mothers were given the tasks for their children to perform, so the subject matter of attributions was similar, although not identical, for every mother. The event for which attributions were generated was real not hypothetical, so the mothers were likely to generate on-line, effortful cognitive processes. Furthermore, since the event involved the mother's child, it was likely that mothers experienced an enhanced emotional connectedness with the subject matter thereby encouraging them to generate attributions. However, possible disadvantages to this method have also been noted (Genest, & Turk, 1981). For example, providing a continuous monologue while performing an activity such as monitoring the behaviour of her child can be a demanding task for the mother. Because the task is demanding there is a possibility that the mother will fall into well-rehearsed

automatic cognitive patterns rather than providing on-line, effortful cognitive processing which would include the generation of attributions.

The Present Study

In summary, the purpose of this study was to investigate differences in attributions and responses between mothers of sons with ADHD and mothers of nonproblem sons, and to examine the contribution mothers' attributions provide in predicting mothers' responses to child behaviour. The attributions generated were within a mother-child interaction context, where the mothers were to vocalize their thoughts while they watched their sons perform tasks. These attributions were linked to mothers' behavioural responses to the child, as expressed in the positive or negative verbal feedback they provided to their sons upon task completion.

A basic question for this study was which particular types of attributions were predictive of which types of feedback. In this study, attribution categories were formed reflecting the combinations of the attributional dimensions of locus, control, and stability. Locus referred to whether the attribution statement located the cause of an action within the child or external to the child. Therefore, each mother's attribution statement was characterized as either suggesting an internal or external location for the cause of the child's behaviour. All statements characterized as internal also were defined by two further dimensions: control, and stability. Control referred to whether the child's behaviour was controllable by the child or not. Therefore, each mother's internal attribution statement was characterized as either suggesting her child's behaviour was controllable or non-controllable. The stability dimension referred to whether the mother's internal attribution statement suggested that the child's behaviour was an enduring characteristic over time and across situations (stable) or whether the child's behaviour was limited to the specific context the mother was observing (unstable).

Thus, the following combinations of mothers' attribution statements were possible: internal-controllable-stable, internal-controllable-unstable, internal-uncontrollable-stable, internal-uncontrollable-unstable, and external. As well, each attribution referred to either a successful or unsuccessful task performance. For example, during a task that required the child to build a spaceship, an example of an internal-controllable-stable attribution phrase for success generated by the mother as she watched her son perform the task would be "he likes spaceships, and is concentrating hard on building the spaceship". The phrase suggests internal and stable cause because the motivation for building the spaceship is part of the child's disposition, "he likes spaceships". Furthermore the reference to, "concentrating hard", suggests controllability. The phrase is describing successful performance as the child is doing what the task requires – building a spaceship. Based on previous research (e.g., Dix, Ruble, Grusec & Nixon 1984; Johnston &

Patenaude, 1994), it was predicted that a mother, after generating such an attribution, would provide her child with praise such as “great job.” The mother’s verbal feedback to the child was used to indicate the extent to which the mother approved or disapproved of the child’s task performance. The mother was not limited in the type of feedback statement she could provide, and these were categorized as praise, qualified praise, criticism, or other statements.

In this study, attributions were not the only types of statements elicited from mothers when they were thinking aloud about their child’s performance. Mothers had the opportunity to freely express any type of statement during the think aloud part of the task including descriptive statements. These descriptive statements, which were non-causal, were mothers’ observation of their child’s performance and reflected perceptions of the child’s success or failure in the task. All other mother statements that were neither attributions nor descriptions were coded as “other statements”. It was assumed that the two categories of mothers’ statements (i.e., attributions, and descriptions) would both contribute to predicting the mothers’ behavioural expression or feedback to the child. The focus of this study was the extent mothers’ attributions predicted their behavioural reactions to the child beyond the extent to which their descriptive statements predict behavioural reactions.

Method

Participants

Participants included 90 mother- son pairs. In 45 of the pairs, the son was diagnosed as having ADHD and in 45 the son was non-problem. General participant demographic information was collected using the General Family Information Questionnaire completed by the mother. This questionnaire was designed for this study, and included the following demographic information: mother’s age, child’s age, and social economic status. The average child’s age, social economic status (SES) and mother’s age were generated for both the nonproblem and ADHD group (see Table 1). Calculations of SES were performed using education level and occupation for both mother and father (Hollingshead, 1975), with higher values indicating a lower SES status. Independent samples *t*-tests were performed to determine group differences on these demographic variables. No significant group differences were found.

Table 1

Group Differences on Demographic Variables

Variable	ADHD (<u>n</u> =45)		Non Problem (<u>n</u> =45)		t
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
Child's age in months	117.04	20.51	110.89	19.49	1.46
SES	2.47	1.04	2.09	.82	1.91
Mother's age in years	38.27	5.79	39.93	4.51	-1.52

For the non-problem group, children were not included in the study if their mothers answered yes to more than one of the following; the child had visited a mental health professional, had a learning problem, was in a special education class, or was taking medication for behaviour problems. For the ADHD group, the child was included in this group if the mother indicated that a mental health or educational professional had diagnosed the child with ADHD, the child did not have a pervasive developmental delay, and on Disruptive Behaviour Scale (DBS) (DuPaul, 1991) showed either six or more Inattention or six or more Hyperactive/Impulsive symptoms as reported by both the mother and another significant adult. The DBS is a measure of parents' ratings of DSM-IV attention, and hyperactive/impulsive symptoms of ADHD exhibited by the child. The attention and hyperactive/impulsive scales each have nine items rated as (0) not at all to (3) very much problematic for the child. Satisfactory psychometric properties for this measure have been demonstrated (DuPaul, 1991). In this study, mothers provided their own ratings and also reported on how another significant individual in the child's life (e.g., teacher, guardian) rated the child. Ratings of 2 or 3 were taken to indicate symptom presence.

If the mother's son with ADHD was taking medication for the disorder, the mother was asked to complete all questionnaires while thinking about her son's behaviour off medication. In addition, sons with ADHD were withdrawn from stimulant medication at least 24 hours prior to participating in the laboratory task observation.

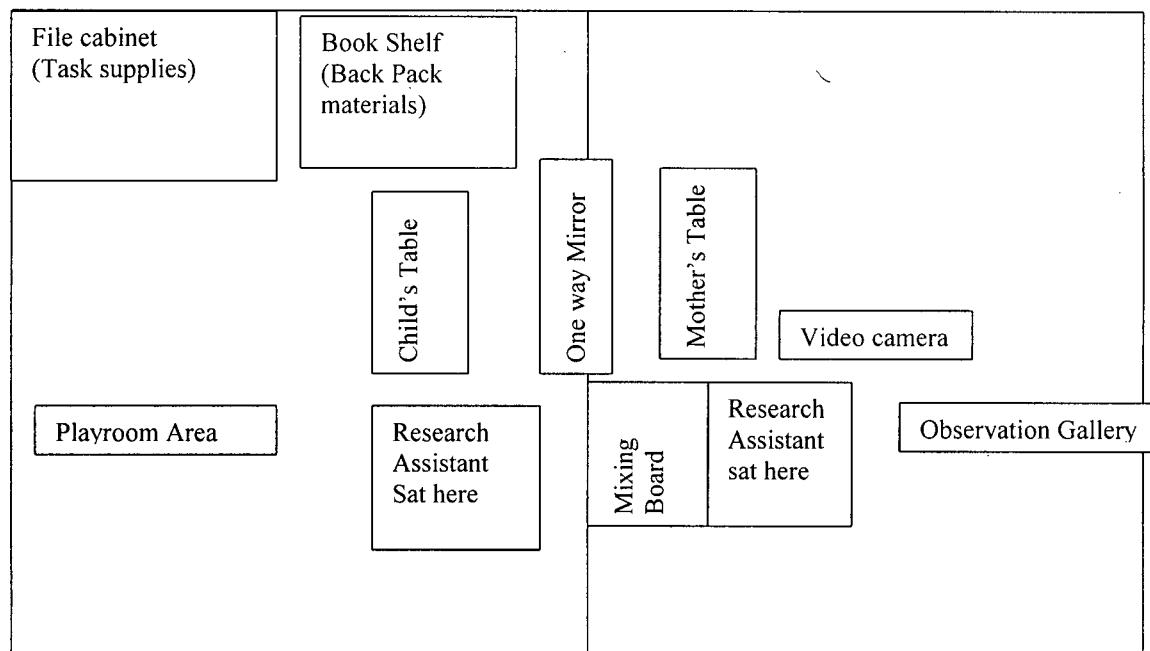
Procedure

Mothers and sons were recruited through advertisements placed in community centers, newspapers and public libraries. Mothers and their sons with ADHD were also recruited through ADHD parent support newsletters. When mothers indicated an interest in the study, they were contacted by telephone and asked to provide initial information concerning the suitability of their son for the study.

Upon arriving at the university, two research assistants met the mother and child and escorted them to the laboratory task area. Consent for participation in the study was obtained from the mother and assent was obtained from the son. The laboratory task area had two rooms, an observation gallery and playroom, separated by a one-way mirror (see Figure 1). One research assistant escorted the mother to the observation gallery. The mother was seated at a table in front of the one-way mirror with the curtains of the one-way mirror closed. The mother was asked to wear a head microphone, that was used to communicate with the child and to record the mother's verbal expressions. Next to the mother's table, a video camera was set up to record the child's behaviours through the one-way mirror.

The other research assistant remained with the child in the playroom area where the child performed his tasks. The child sat at a table facing the one-way mirror. The playroom included tables, chairs, sofas and shelves with various toys. In addition, boxes with the materials used in three of the four tasks (i.e., pegs for the Lite Brite task, pegs for the Construction Peg task, and action figures for the Action Figures task) were stored in a file cabinet. Objects used for the fourth task, Back Pack, were spread out on the bookcase shelves. The playroom also included a speaker on the child's table, which allowed for communication from the mother. The child and the research assistant played together when the child was not listening to the mother or completing tasks.

Figure 1. Layout of laboratory Task Setting.



Equipment

An Alesis mixing board provided input and output functions for devices. Two main inputs to the mixing board were the video camera, a Hitachi VHS (providing audio and visual recording of the child's behaviour), and the mother's Audio Tech. head-worn microphone (provided an audio recording of the mother's vocal expressions). The audio from the mother's microphone was outputted to the child's room to a Roland speaker with a switch controlling the audio output to the child.

Measures

Think Aloud and Feedback Task. The research assistant explained to the child's mother the general task procedures and equipment, and introduced the think aloud procedure. The mother instructed the child to perform four tasks, each divided into two parts. There also was a warm-up task with two parts. For each part of each task, the mother was asked to provide instructions to the child as to how to perform the task and then asked to provide feedback to the child regarding performance. The mother was instructed that she was able to observe her child through the one-way mirror; however, her child was not able to see her or speak to her. The mother, however, was able to speak to her child through the headset microphone and speaker in the child's room when she provided instructions and feedback, but not at other times. The mother was provided basic

instructions regarding the child's tasks. However, she was told that the specifics of how to deliver the instructions to the child were left to her. The mother was told that the speaker in the child's room was on when she provided instructions and feedback to her child. The mother was informed that while her child was performing a task, she was to vocalize her thoughts as to why her child was behaving in a certain manner or how well he was behaving (think aloud phase). The mother was instructed that her child was not able to hear her vocalize these thoughts as the connection to the child's speaker was off during task performance. The mother was instructed that the child had a maximum of 2 minutes to complete each part of each task. After the 2 minutes or less of think aloud, the mother was instructed that the speaker was turned on and the child was able to hear her. At this point, the mother was instructed to provide verbal feedback to her child regarding his performance during the task part (feedback phase).

Think Aloud Training

After the general procedures were provided to mothers, they were trained in using the think aloud procedure (Cacioppo, von Hippel, & Ernst, 1997; Davison, Vogel, & Coffman, 1997). The mothers were provided with the following analogy. They were asked to recall watching their son perform a chore at home. The mother was then asked if she had ever thought about: how well was her son performing the chore or why was he performing the chore in a particular way while she watched him. The mother was then instructed that this study was interested in those same type of thoughts. The mother was also instructed that her vocalized thoughts need not be special or conclusive of her child's behaviour. Furthermore, the mother was instructed that the purpose of this study was to acquire information as to how mothers react to and explain their son's behaviour. If the mother fell silent during the think aloud, she was prompted by the research assistant to vocalize her thoughts.

Child Instructions

A research assistant explained to the child that his mother was watching what he was doing, but he was not be able to see his mother. The research assistant also explained to the child that he was not able to communicate to his mother during the tasks, but she was to communicate instructions and other information to him. The research assistant also explained to the child that while the mother was talking or when the child was engaged in a task, the child was not allowed to talk to the research assistant. The child was further instructed that the tasks were not tests of how well he performed. Rather, it was explained that the study's purpose was to determine how sons and mothers get along.

Tasks

The child performed five tasks. The task sequence was as follows: warm-up task, and then some sequence of the four remaining tasks (Lite Brite, Construction Pegs, Action Figures, and Back Pack). These four tasks were counterbalanced across mother-son pairs. The function of the warm-up task was to let the mother and child become familiar with the equipment and procedures and to let the mother try the think aloud process. In the warm-up task, as with the remaining four tasks, there were two parts. In the first part of the warm-up task, the mother asked the child to walk to an "X" on the floor, and remove his shoes and socks and then put them back on. In the second part, the mother asked the child to stand in front of the playroom door. The think aloud and feedback sections for each part in the warm-up task were not coded. In the first part of the Lite Brite task, the child was instructed to make a square with blue pegs on the lite brite board. In the second part, the child was instructed to make a "V" with red pegs. In the first part of the Construction Pegs task, the child was instructed to make three columns of pegs, each column with 12 black, 12 pink, 12 blue pegs, and then to join the columns together. In the second part of this task, the child was instructed to construct a spaceship using blue and green pegs. In the first part of the Back Pack task, the child was instructed to remove the back pack from the shelf, place the water bottle in the back pack, and remove all the socks except the red ones. In the second part of the task, the child was instructed to find three pens put them in a pencil case, and put the pencil case along with red and blue notebooks into the back pack. In the first part of the Action Figures task, the child was instructed to select only those figures with purple on them. In the second part of the task, the child was instructed to sort action figures into three categories – those with slime on them, furry animals, and those with capes.

Coding

Mothers' think aloud expressions and feedback for the four tasks were transcribed and coded in stages. At least three independent coders coded the think aloud expressions and feedback using a detailed manual. Coders attended weekly meetings and discussed coding discrepancies as they arose. The coders coded from the videotapes that recorded the mother's think aloud expressions and feedback along with her child's behaviour. The following five coding stages were completed in this sequence: 1) transcribed mothers' statements into meaningful phrases; 2) coded the meaningful phrases during the think aloud portions of the task as either attributions for child behaviour, descriptions of child behaviour or other and as referring to either a child's success or failure at the task; 3) coded attributions in terms of locus; 4) coded attributions with an internal locus for stability and controllability; 5) coded meaningful phrases

obtained from mothers during the feedback phases for statements of praise, qualified praise, criticism and other.

In the first coding stage, statements made during the think aloud and feedback phases were transcribed in meaningful phrases. The general rule was to divide mothers' statements into meaningful phrases based upon the notion of creating as many discrete units of meaning as possible. An example of a complex statement is the following: "He's building the spaceship because he loves star wars". It is possible to break this complex statement into two meaningful phrases – in this case a description phrase and an attribution phrase: "He's building the spaceship" (this offers a description of the child's behaviour) "because he loves star wars" (this offers an explanation of why the child is building the spaceship).

In the second coding stage, coders decided whether think aloud phrases were attributions or descriptions of the child's behaviour. The third category was "other", the mother's phrase was neither an attribution nor description of her child's behaviour. Attributions are causal explanations mothers generate regarding their child's behaviour, and descriptions are non-causal phrases describing or evaluating their child's behaviour. The following is an example of a scenario and an attribution phrase: a mother notices her child performing a task slowly and she says, "he has a terrible memory for instructions." The mother, by providing this phrase, explains why the child performs the task slowly (attribution). Using the same scenario, the mother's phrase, "he is moving so slow," is a description, as it does not contain a causal inference. As coders decided whether a phrase was an attribution, description, or other, they also noted whether the phrase referred to the child's success or failure at the task. Coders determined child success or failure based on the mother's perception of her child's performance.

In the third coding stage, coders determined the locus of mothers' attributions for child behaviour. Locus is an attribution dimension that defines whether the cause of the behaviour was attributed to factors within the child, internal, (e.g., "he's really smart") or to factors external to the child, external, (e.g., "this task is really easy").

In the fourth coding stage, for each attribution phrase previously coded as an internal attribution, coders determined the stability and control of the attribution. The stability dimension suggests whether the causal content has or will persist over a period of time, stable, (e.g., "he always works hard") or is temporary in a particular context, unstable, (e.g., "he's tired today"). The control dimension defines whether the causal content suggests that the child influenced the behaviour, controllable, (e.g., "he tried hard") or whether the child had little or no influence over the behaviour, uncontrollable, (e.g., "he doesn't know how"). After the four coding stages were completed, each attribution phrase was labeled with one of the following five code combinations:

external, internal-controllable-stable, internal-uncontrollable-stable, internal-controllable-unstable, internal-uncontrollable-unstable. Each combination was also designated as referring to successful or failure child behaviour.

In the fifth stage, coders rated mothers' meaningful phrases during the feedback phases. These phrases were coded into four categories: praise, qualified praise, criticism and other. Praise phrases meant that the mother was pleased with her child's task performance (e.g., "great job", "good job"). Qualified praise phrases meant that the mother was satisfied with her son's task performance, but had some reservations (e.g., "that's ok", "don't worry, you'll do better"). Criticism phrases suggested that the mother was dissatisfied with her child's task performance (e.g., "I am not impressed with your performance", "why didn't you listen to the instructions").

For each of the five stages of coding (basic transcription; attributions, descriptions and other; locus; controllability; and feedback) inter-rater reliability was calculated. Calculation of reliability involved dividing the number of agreements between coders by the total number of total coded statements. Coders coded independently and were unaware as to which of their transcriptions were double-coded for reliability assessment. For each stage, 33% of the tapes were double-coded. Stage one's reliability was 84.73%, stage two's reliability was 84.29%, stage three's reliability was 93.85%, stage four's reliability was 87.52%, and stage five's reliability was 84.39%.

Results

Type I Error Rate

With regards to type I error rate, a lenient approach was taken by using a contrast based error rate (type I error rate for each test), and not using a Bonferroni procedure. In addition, alpha was set at .10 for each comparison. This lenient approach was justified because of the preliminary nature of the research (this was the first time that these types of tasks have been used in this area of research). However, this study's predictions were not exploratory but were a priori and based upon previous research. Furthermore, in recognition of this leniency, interpretations were focused both on significance level and effect size, and I caution that all of the significant results obtained require replication.

Each of the eight think aloud phases for each mother were combined to produce a total number of think aloud verbal expression phrases. The total number of think aloud phrases consisted of all types of attributions for child success and attributions for child failure as well as description of child success phrases, description of child failure phrases and other phrases. As well, total frequencies for each type of attribution, description and other category were computed.

Ratios were computed for each attribution, description and other category by dividing the frequency of each category by the total number of think aloud verbal expression phrases.

Praise, qualified praise, criticism and other statements were summed together to obtain a total number of feedback phrases. As well, total frequencies for each feedback category, praise, qualified praise, criticism, and other were calculated. Each feedback category frequency was divided by the total number of feedback phrases to obtain a ratio for each feedback category. The resulting ratios obtained for all think aloud and feedback categories were used as variables in all analysis.

The distributions for mothers' descriptions, attributions and feedback statements for the entire sample were visually inspected for outliers and skew. No outliers were found. Inspection indicated asymmetry in many of the variables and the skewness score for each variable is indicated in Table 2. A lack of symmetry is generally indicated in values that are greater than 1, positive values indicate a positive skew, while negative values a negative skew. In general, most variables show a high positive skew, as values are greater than 1 for all variables except descriptions for success and positive feedback. The high level of positive skew in most of the variables would make transformations, e.g., square root transformation, of the data unsuccessful (Howell, 1992). Furthermore, the statistical analysis performed (t-tests, regressions, and correlations) are fairly robust to the violation of the normality assumption (Howell, 1992). Therefore transformations were not used.

Table 2
Skewness of Distributions of Descriptions, Attributions and Feedback Statements for Total Sample (N=90)

Variable	Skewness
Descriptions	
Success	.115
Failure	2.145
Attributions	
Internal Controllable Stable for Success	2.644
Internal Controllable Unstable for Success	2.222
Internal Uncontrollable Stable for Success	1.594
Internal Uncontrollable Unstable for Success	1.824
External for Success	1.467
Internal Controllable Stable for Failure	5.496
Internal Controllable Unstable for Failure	2.940
Internal Uncontrollable Stable for Failure	3.674
Internal Uncontrollable Unstable for Failure	1.690
External for Failure	2.440
Feedback	
Positive	.945
Qualified Praise	2.489
Criticism	1.096

Relationships Among Demographics and Mothers' Attributions and Feedback Statements

Correlations were performed between the demographic variables and the attribution variables (see Table 3). These correlations guided the inclusion of demographic variables in subsequent regression equations. In particular, demographic variables that correlated with the attribution variables (predictors in the regressions) were included in the regressions as control variables. From Table 3, it can be seen that child age was correlated at the .10 level with internal uncontrollable stable attributions for success and SES is correlated with internal uncontrollable stable attributions for failure. Therefore, in subsequent regressions child age is entered in regression models using internal uncontrollable stable attributions for success as predictors, and

SES is entered in regression models using internal uncontrollable stable attributions for failure as predictors.

Table 3

Pearson Correlations Showing the Relationships between Demographic Variables and Attributions and Dependent Variables (N=90)

Variable	Demographics		
	Child Age	Mothers Age	SES
Attributions			
Internal Controllable Stable for Success	.09	-.12	.11
Internal Controllable Unstable for Success	.07	-.10	-.06
Internal Uncontrollable Stable for Success	-.20*	.00	-.16
Internal Uncontrollable Unstable for Success	-.01	-.14	.10
External for Success	.04	.02	-.05
Internal Controllable Stable for Failure	.03	.03	-.13
Internal Controllable Unstable for Failure	-.05	.04	-.17
Internal Uncontrollable Stable for Failure	.06	.03	-.19*
Internal Uncontrollable Unstable for Failure	.05	-.09	-.10
External for Failure	-.12	.17	-.03
Feedback			
Positive	-.05	.06	-.03
Qualified Praise	.11	-.11	.24**
Criticism	-.02	-.11	.00

* $p < .10$. ** $p < .05$ (two-tailed)

Correlations were also performed to determine the relationships between demographics and feedback statements (see Table 3). Again, these correlations guided decisions regarding which demographic variables to control for in the regression models. The correlation results indicated that SES is significantly related to qualified praise. Therefore, for each regression model including qualified praise as the dependent variable, the demographic variable SES was included as a predictor.

Comparison of ADHD and Non-problem Groups

Independent sample *t*-tests were generated to determine group differences in frequencies of description, attribution and feedback statements (Table 4). The groups differed on description statements. As might be expected, mothers of non-problem children generated more description of success statements while watching their children perform the tasks, and mothers of children with ADHD children generated more description of failure statements. However, these effects were relatively small as the eta squares suggested that group differences accounted for 3% of the variance for successful descriptions and 4% of the variance for failure descriptions

For attributions for successful child performance, there were no significant differences between mothers of nonproblem sons and mothers of sons with ADHD in their attributions of causality as internal to the child. However mothers of sons with ADHD were more likely than mothers of nonproblem sons to attribute their child's success to factors external to the child. The eta squared suggested that the group difference was of moderate size, accounted for 10% of the variance in mothers' external attributions of success. For attributions for failure performances, mothers of sons with ADHD were more likely than mothers of nonproblem sons to attribute their sons' failure to internal causes that were both controllable and unstable or uncontrollable, stable or unstable. These effects were of small to medium size.

For feedback statements, the mothers of sons with ADHD generated significantly more positive feedback statements (a small effect with eta squared of .02), whereas the mothers of nonproblem sons generated significantly more criticism statements (eta squared was .06).

In summary, in comparison to mothers of nonproblem sons, mothers of sons with ADHD less often described their sons as succeeding, and were more likely to attribute child success to external factors. In contrast, they more often described their sons as failing, and attributed this to factors internal to the child. Despite these differences in descriptions and attribution, mothers of sons with ADHD were more likely to praise their sons and less likely to criticize as compared to mothers of nonproblem sons.

Table 4

Group Differences for Descriptions, Attributions and Feedback (N=90)

Variable	ADHD		Non Problem		t	n ²
	M	SD	M	SD		
Descriptions						
Success	.3899	.1448	.4465	.1638	-1.74*	.03
Failure	.0781	.0731	.0524	.0482	1.97*	.04
Attributions						
Internal Controllable Stable for Success	.0193	.0224	.0160	.0248	.65	
Internal Controllable Unstable for Success	.0167	.0226	.0211	.0034	-.75	
Internal Uncontrollable Stable for Success	.0278	.0220	.0226	.0290	.96	
Internal Uncontrollable Unstable for Success	.0131	.0148	.0154	.0216	-.60	
External for Success	.0191	.0202	.0081	.0114	3.16**	.10
Internal Controllable Stable for Failure	.0005	.0029	.0008	.0036	-.34	
Internal Controllable Unstable for Failure	.0066	.0113	.0027	.0075	1.91**	.04
Internal Uncontrollable Stable for Failure	.0060	.0135	.0016	.0056	2.30*	.05
Internal Uncontrollable Unstable for Failure	.0088	.0113	.0037	.0067	2.60*	.07
External for Failure	.0064	.0130	.0087	.0145	-.79	
Other Statements	.4074	.1445	.4003	.1552	.23	
Feedback						
Positive	.3710	.1596	.3239	.1383	1.49**	.02
Qualified Praise	.0605	.0523	.0631	.0773	-.19	
Criticism	.1046	.0857	.1556	.1178	-2.35**	.06
Other	.4643	.1470	.4574	.1186	.25	

Note. Attributions, descriptions, and other statements are ratios of total statements made in the think aloud phase. Feedback types are ratios of total statements made in the feedback phase.

* $p < .10$. ** $p < .05$ (two-tailed)

Correlations between Descriptions, Attributions and Feedback Statements

Correlations were generated showing the relationships between descriptions and attributions, and feedback for the entire sample (Table 5). Mothers' descriptions of success were

not related to any of the feedback variables, whereas descriptions of failure were negatively related to positive feedback and positively related to criticism feedback. With regards to internal attribution statements for success, both controllable stable and uncontrollable stable were positively related to positive feedback and negatively related to criticism feedback. That is, the more mothers saw their son's success as due to internal stable factors, whether controllable or not, the more they reacted positively to the child and the less likely they were to criticize. Furthermore, internal controllable unstable attributions for success were positively related to qualified praise feedback while internal uncontrollable unstable attributions for success were negatively related to qualified praise feedback. Unexpectedly, attributions of the child's failure to internal controllable stable factors were positively related to positive feedback. However, attributions of failure to internal controllable unstable causes were negatively related to positive feedback and positively related to criticism feedback.

In summary, attributions for success that were internal and stable were significantly related to both positive and criticism feedback. That is, where mothers saw their sons' success as due to either controllable or uncontrollable, internal stable factors they were more likely to react positively to the child and less likely to react negatively to the child. However, when mothers saw their sons' success as due to unstable controllable factors they were more likely to respond with only qualified praise. Furthermore, when mothers saw their sons' success as due to uncontrollable unstable internal factors they were less likely to use qualified praise. As for attributions for failure that were internal, controllable, and stable mothers who saw their sons' failure as due to those factors were more likely to respond positively to their sons. However, mothers who saw their sons' performance failure as due to internal controllable unstable factors were more likely to respond negatively to their sons' performance. External attributions for success and failure were not related to any feedback variable. In general, these relationships accounted for between 2 and 10% of the variance in feedback, indicating small to medium effects.

Table 5

Pearson Correlations Showing the Relationship between Attributions, Descriptions and Feedback (N=90)

Variable	Feedback		
	Positive	Qualified Praise	Criticism
Descriptions			
Success	.09	-.10	.10
Failure	-.29**	.10	.31**
Attributions			
Internal Controllable Stable for Success	.21**	.08	-.16*
Internal Controllable Unstable for Success	.03	.14*	.02
Internal Uncontrollable Stable for Success	.16*	-.11	-.24**
Internal Uncontrollable Unstable for Success	.01	-.20**	-.14
External for Success	.03	.05	-.15
Failure Internal Controllable Stable	.22**	-.11	-.02
Failure Internal Controllable Unstable	-.21**	.01	.18**
Failure Internal Uncontrollable Stable	-.12	-.12	.02
Failure Internal Uncontrollable Unstable	.04	-.07	.09
External for Failure	.02	.01	.02

* $p < .10$. ** $p < .05$ (two-tailed)

Regressions

Hierarchical regressions were used to test the contributions of mothers' attributions to predicting feedback to the child, above and beyond the contributions from group membership, descriptions of child behaviour, and relevant demographic variables. Regressions were conducted only for attribution variables that were significantly correlated with feedback variables (see Table 5). The form of each regression was the following: in the first step, the descriptions of child behaviour (the percentage of mothers' think aloud statements that were describing child behaviour) and group membership (dummy coded in that if the child was Non-problem the group value was 0, and if the child was identified as with ADHD the group value was 1) were entered. If the regression model examined attributions for child success (the percentage of mothers' think aloud statements that were attributions for child success) then descriptions of successful

performance were entered. If the regression examined an attribution for failure (the percentage of mothers' think aloud statements that were attributions for child failure) then descriptions of failure performance were entered. Further, demographic variables were entered at step 1 depending on the correlations presented in Table 3. For example, child age was entered in the regression model using internal uncontrollable stable attributions for success and SES was entered in the regression model using internal uncontrollable stable attributions for failure. Furthermore, based upon previous correlations, SES was included in the first step for all regressions with qualified praise as the dependent variable. In each of the regressions, the attribution variable was entered in the second step. Finally, in the third step, the Group by Attribution interaction term was entered. This interaction tested whether group membership moderated the relationship between attribution and feedback.

For each hierarchical regression, the following results were examined: the R square for each block, the R square change for each block, and the F statistic and significance for each block of variables. Furthermore, standardized coefficients and their t values and significance, and semi-partial correlations for each variable in each block were examined when necessary.

Internal Controllable Stable Attributions for Success

In the regression model using mothers' internal controllable stable attributions for child success to predict positive feedback, the F s for the model at the second and third steps were significant, but the R^2 change was significant only for the change from step 1 to step 2. That is, adding the Group by Attribution interaction did not account for significant variance. Therefore, the model at step 2 was considered most appropriate, $R^2 = .09$, $F(3, 86) = 2.95$, $p < .05$; R^2 change = .06, $F(1, 86) = 5.25$, $p < .05$. The betas for variables at this step are shown in Table 6. Only attributions made a significant contribution to the model, with attributions of success to internal controllable stable factors predicting more positive feedback. In the regression using internal controllable stable attributions for success to predict criticism, the model was significant at step 1 and step 2, but the R^2 change was significant only for step 1. Therefore, the step 1 model was considered the most appropriate $R^2 = .06$, $F(2, 87) = 2.90$, $p < .10$. Of the two variables, group and descriptions of success, entered at this step, only group made a significant contribution, beta .23, $p < .05$. Mothers in the nonproblem group used more criticism. In sum, mothers' attributions of their child's success to internal, controllable, and stable factors significantly predicted their use of positive feedback, above and beyond the effects of group and description, but did not predict negative feedback. These relationships were not moderated by group membership.

Table 6

Regression Analysis for Internal Controllable Stable Attributions for Success Predicting Mothers' Positive Feedback (N = 90)

Variable	B	SE B	β
Group	-.05	.03	-.17
Descriptions of Success	.17	.10	.17
Internal Controllable Stable Attributions of Success	1.50	.65	.24**

** $p < .05$

Internal Controllable Unstable Attributions for Success

In the regression model using mothers' internal controllable unstable attributions for success to predict qualified praise, the F s for the model at the second and third steps were significant, but the R^2 change was not significant for any change in step. The first step was not considered significant as $F(3, 86) = 2.08, p = .11$.

Internal Uncontrollable Stable Attributions for Success

In the regression model using mothers' internal uncontrollable stable attributions for success to predict positive feedback, the F s for the model at the second and third steps were significant, but the R^2 change was significant only for the change from step 1 to step 2. Again, the interaction did not explain significant additional variance. Therefore, the model at step 2 was considered most appropriate, $R^2 = .09$, $F(4, 85) = 2.10, p < .10$, R^2 change = .04, $F(1, 85) = 3.76$. The betas for variables at this step are shown in Table 7. Group, descriptions of success, and attributions all made significant contributions to the model. Mothers of sons with ADHD used more positive feedback. Descriptions of success were predictive of more positive feedback. Finally, attributions of success to internal uncontrollable stable factors predicted more positive feedback. In the regression using internal uncontrollable stable attributions for success to predict criticism, the model was significant at steps 2 and 3, but the R^2 change was significant only for the change from step 1 to step 2. Therefore, step 2 was considered most appropriate, $R^2 = .11$, $F(4, 85) = 2.55, p < .05$, R^2 change = .04, $F(1, 85) = 4.23, p < .05$. The betas for step 2 variables are shown in Table 7. Of the variables entered at this step, group and internal uncontrollable stable attributions made a significant contribution, where mothers of nonproblem boys used more criticism, and attributions for success to internal uncontrollable stable factors predicted less criticism. In summary, for all mothers, attributions of their child's success to internal uncontrollable stable factors significantly predicted an increased use of positive feedback and

decreased use of criticism above, and beyond the effects of child age, group, and descriptions of success.

Table 7

Regression Analysis for Success Internal Uncontrollable Stable Attributions Predicting Mothers' Positive Feedback (N = 90)

Variable	Positive Feedback			Criticism Feedback		
	B	SE B	β	B	SE B	β
Child age	.00	.00	-.08	.00	.00	-.03
Group	-.06	.03	-.19*	.05	.02	.22**
Descriptions of Success	.23	.11	.23**	-.02	.08	-.03
Internal Uncontrollable Stable Attributions For Success	1.31	.68	.22*	-.97	.47	-.24**

* $p < .10$, ** $p < .05$

Internal Uncontrollable Unstable Attributions for Success

In the regression model using mothers' internal uncontrollable unstable attributions for success to predict qualified praise, the F s for the model at the second and third steps were significant, but the R^2 change was not significant for any change in step. The first step was not considered significant as $F(3, 86) = 2.08$, $p = .11$.

Internal Controllable Stable Attributions for Failure

In the regression model using mothers' internal controllable stable attributions for failure to predict positive feedback, the F s for the model at the first, second, and third steps were significant, but the R^2 change was significant only for the change from step 1 to step 2. Therefore, the model at step 2 was considered most appropriate, $R^2 = .26$, $F(3, 86) = 9.96$, $p < .05$, R^2 change = .12, $F(1, 86) = 14.16$, $p < .05$. The betas for variables at this step are shown in Table 8. Of the three variables, group, descriptions of failure, and attribution, all three made a significant contribution to the model. Mothers of sons with ADHD used more positive feedback. Descriptions of failure were predictive of less positive feedback. Finally, internal controllable stable attributions for failure were predictive of more positive feedback. In sum, mothers' attributions of their child's failure to internal, controllable, stable factors significantly predicted positive feedback, above and beyond the effects of group and descriptions of failure.

Table 8

Regression Analysis for Internal Controllable Stable Attributions for Failure Predicting Mothers' Positive Feedback (N = 90)

Variable	B	SE B	β
Group	-.08	.03	-.26**
Descriptions of Failure	-1.10	.24	-.46**
Internal Controllable Stable Attributions of Failure	16.89	4.49	.37**

** $p < .05$

Internal Controllable Unstable Attributions for Failure

In the regression model using mothers' internal controllable unstable attributions for failure to predict positive feedback, the F s for the model for the first, second and thirds steps were significant, but the R^2 change was significant only for the step 1. Attributions and the interaction of Attribution and Group did not contribute significantly to the model. Therefore, step 1 was considered the most appropriate model to report, $R^2 = .14$, $F(2, 87) = 6.83$, $p < .05$. Of the two variables, group and descriptions of failure, both made a significant contribution to the model respectively, beta $-.23$, $p < .05$, and beta $-.34$, $p < .05$. Mothers of sons with ADHD used more positive feedback and descriptions of failure predicted less positive feedback. In the regression model using mothers' internal controllable unstable attributions for failure to predict criticism feedback, the F s for the model for the first, second and thirds steps were significant, but again the R^2 change was significant only for the step 1. Therefore, the model at step 1 was considered the most appropriate to report $R^2 = .20$, $F(2, 87) = 10.58$, $p < .05$. Both of the step 1 variables, group, beta $.32$, $p < .05$, and descriptions of failure, beta $.38$, $p < .05$ made significant contributions to the model. In sum, mothers of nonproblem sons used more criticism feedback. Finally, descriptions of failure predicted more criticism feedback.

These regression results indicated that both group membership and descriptions of failure frequently accounted for significant amounts of variance in mothers' feedback. To investigate the independence of the contributions of group membership and descriptions of failure, correlations were performed between group and the feedback variables, controlling for descriptions of failure (Table 9).

Table 9

Correlations Showing the Relationship between Group (ADHD and Non Problem) and Failure Descriptions (N=90)

Variable	Feedback		
	Positive	Qualified Praise	Criticism
Group	-.16	.02	.24**
Group (controlling for Descriptions of Failure)	-.23**	.04	.33**

* $p < .10$. ** $p < .05$ (two-tailed)

The correlation between group and positive feedback controlling for descriptions of failure was significant. Mothers of sons with ADHD used more positive feedback than mothers of nonproblem sons, even after the contribution of descriptions of failure was removed. Similarly, the correlation between group and criticism with descriptions of failure partialled was significant. Mothers of nonproblem sons used more criticism feedback than mothers of ADHD sons, even with contribution of descriptions of failure removed. This suggests that both group and descriptions were independently related to mothers' use of feedback.

Discussion

This study examined mothers' attributions for child behaviour and mothers' responses to child behaviour in mothers of sons with ADHD and mothers of nonproblem sons. Mothers' attributions and responses were generated during interactions with their sons. Specifically, mothers provided their sons with task instructions and then used a think-aloud procedure to generate attributions as well as descriptions of child behaviour and other statements while watching their sons perform the tasks. After their sons had performed each task, mothers provided vocal feedback to their child. The think-aloud procedure is a recent methodology, designed to be on-line and ecologically valid.

One goal of the study was to examine differences between mothers of sons with ADHD and mothers of nonproblem sons in the frequency of various types of attributions for child behaviour they generated, as well as differences in feedback provided to the child. A second goal was to examine the relationships between types of attributions and types of feedback, and to test whether these same relationships emerged for both mothers of sons with ADHD and mothers of nonproblem sons. More specifically, this goal involved an examination of the unique contribution

of attributions to predicting mothers' behaviour, over and beyond the predictions afforded by group membership and descriptions of child behaviour.

As predicted and consistent with previous findings (Johnston & Freeman, 1997), in comparison to mothers of nonproblem sons, mothers of sons with ADHD were more likely to attribute child success to external factors. Moreover as predicted, mothers of sons with ADHD were more likely than mothers of nonproblem sons to attribute child failure to factors internal to the child, at least in three of four of internal attributions. This result was also generally consistent with previous findings (Johnston & Freeman, 1997). However, mothers of sons with ADHD were more likely than controls to attribute child failure to both controllable and uncontrollable and to unstable and stable factors. This result was inconsistent with previous findings (Johnston & Freeman, 1997; Johnston et al., 1998) in that the results from these studies suggested that child failure was more likely to be attributed by mothers of sons with ADHD to uncontrollable stable factors. The discrepant stability and control findings in this study as compared to previous studies may reflect that mothers of sons with ADHD in this study were only more willing to attribute child failure to general factors internal to the child rather than attributing failure to external sources. That is, because both the control and stability factors yielded inconsistent findings, mothers may have been showing a general tendency to attribute child behaviour failure to internal factors, regardless of whether they were controllable or stable.

Mothers of sons with ADHD as compared to mothers of nonproblem sons were also more likely to describe their sons' task performance as failure. So, in sum, mothers of sons with ADHD saw their children as failing and attributed this to factors within the child. However, despite these differences in attributions and descriptions, mothers of sons with ADHD were more likely to praise their sons and less likely to criticize as compared to mothers of nonproblem sons. Mothers of sons with ADHD knew that their sons were performing the tasks without medication. Given this, It is possible that these mothers had a lower threshold for offering praise because they knew their sons were without medication and were less likely to succeed in the tasks. Similarly, mothers of sons with ADHD may have been cautious of using criticism for fear of provoking temper or upset reactions in the child. It is possible that the characteristics of this task, such as the relatively isolated nature of the child or the lack of relevance of the tasks, led mothers to be supportive in offering praise to the child. Previous studies (e.g., Johnston & Patenaude, 1994) sought parent reactions to child behaviour without the child present, so in past studies parents were not concerned with possible effects their responses would have on their child. Therefore, it also is possible that parent reaction discrepancies between this study and past studies are because of the presence of the child during the parent response.

The attribution frequency differences between mothers of nonproblem sons and mothers of sons with ADHD are somewhat consistent with the adoption of a neurobiological disease model to explain ADHD (Barkley, 1998). Mothers of sons with ADHD may have received information regarding the neurobiological perspective of ADHD from health care professionals and others. The neurobiological disease model suggests that symptoms of ADHD (e.g., inattention, impulsivity) prevent a child from successfully performing tasks and that these symptoms are primarily amenable to pharmacological treatment. Furthermore, the neurobiological model suggests that these symptoms are enduring and chronic. Mothers of sons with ADHD appear to be providing attributions that are generally consistent with an exposure to this model in that they attribute child failure to factors within the child and uncontrollable (i.e., the ADHD symptoms); however, they also attribute child success to factors external to the child. Perhaps mothers extend the neurobiological model to also mean that the child's ADHD prevents successful task completion (e.g., "he can't do it"). Thus, success experiences are, by default, attributed to structural factors such as task ease. Moreover, for this study mothers were aware that their sons with ADHD were medication free while performing the tasks. Because the neurobiological model emphasizes medication as an appropriate treatment for ADHD symptoms, mothers may believe that medication is the cause of child's success and without medication, success is attributed to something about the situation. Findings inconsistent with this neurobiological model explanation were that mothers of sons with ADHD also were more likely than mothers of nonproblem sons to generate attributions for child failure that were internal, controllable and unstable. The following caveat should be noted pertaining to the above explanation of mothers' attributions as reflecting a neurobiological disease model of ADHD. The discussion of the neurobiological model accepts the assumption that mothers are relying on their own representations of the neurobiological model, complete with the unfounded or inconsistent assumptions rather than having expertise knowledge of the model.

Another goal of this study was to examine the relationship between mothers' attributions for child behaviour and mothers' feedback. For both mothers of sons with ADHD and mothers of nonproblem sons, attributions for child success that were internal and stable were significantly related to both positive and criticism feedback. That is, mothers who saw their sons' success as due to either controllable or uncontrollable, stable and internal factors were more likely to react positively to the child and less likely to react negatively. This result was somewhat consistent with previous research (Johnston & Leung, 2001), in that internal and stable factors were related to positive parent response. However, this result was inconsistent with previous research in that both controllable and uncontrollable factors were related to positive parent response whereas this

relationship has been previously found only for internal, stable and controllable factors. Furthermore, when mothers saw their sons' success as due to internal, unstable factors, then the controllability in the attribution predicted variations in the use of qualified praise. Attributions of success to internal, unstable, but controllable factors were associated with increased use of qualified praise; whereas, when mothers saw their sons' success as due to internal, unstable and uncontrollable factors they were less likely to respond with qualified praise.

In summary, these results suggest that when mothers attributed their sons' success to factors consistent with previous behaviour (stable), mothers were more likely to respond in a positive manner. Moreover, when mothers see their sons' success as inconsistent with previous behaviour (unstable), responses varied depending on the mother's view of whether the child's behaviour was controllable. These results can be interpreted in following way. When mothers provided praise with reservations, they were indicating to the child that they were only somewhat satisfied with his performance, as they would provide some positive feedback as "you did good but [a qualifier would follow]". For example, the mother would provide qualifiers such as "do better next time". If mothers saw the behaviour as inconsistent with previous performance, but attributed no control to the child for the behaviour, it is reasonable to assume that they would not believe the child could improve his behaviour. However, if mothers attributed control to the child, it is reasonable to assume that they believed there was a possibility that the child could improve his performance. Therefore, mothers who attributed control to their child's unstable success performance were more willing to let their child know that they were less than satisfied with their performance and by doing so perhaps hoped to encourage improvement.

For attributions of failure, differences in mothers' responses were determined by whether the mother attributed the behaviour as consistent or inconsistent with her child's past behaviour. As expected, mothers responded with criticism when sons acted in ways that mothers believed were inconsistent with past behaviour and were internal and controllable. However, for both mothers of sons with ADHD and mothers of nonproblem sons, attributions of child failure to internal, controllable and stable factors were positively related to praise. This result was contrary to predictions and previous research involving parents of sons with ADHD and parents of nonproblem sons (Geller & Johnston, 1995a; Geller & Johnston, 1995b; Johnston & Leung, 2001; Johnston & Patenaude, 1994). A difference between this study's results and past research was that in this study it was the combination of both internal-controllable and unstable factors that provided the relationship to negative parent feedback. In past research (Dix, Ruble, Grusec and Nixon, 1984; Johnston & Patenaude, 1994), internal and controllable factors regardless of the stability factor were related to negative parenting response. This surprising result may be

interpreted with regards to the study's task characteristics. The study utilized multiple tasks that the child was to perform. Because mothers knew there were multiple tasks, these mothers may have been more likely to engage in praise in a "cheerleading" fashion. In other words, although mothers were aware that their child was failing, they may have been less likely to criticize because they knew that further tasks were to be completed and they felt their sons needed support to persevere.

A major goal of this study was to examine the unique contribution mothers' attributions made to predicting mothers' responses utilizing a new task with actual child behaviour during a mother-child interaction as the attributional stimuli. Since this study was different from previous studies (Geller & Johnston, 1995a, 1995b; Johnston & Patenaude, 1994) in that it used actual child behaviours to elicit mother attributions rather than written scenarios which would be constant for all mothers, the type of child stimuli needed to be controlled when the contributions attributions made to predicting responses were examined. Mothers' descriptions of child behaviour were used in the regression analyses to control for these differences in type of child behaviour.

This study's main contribution was the finding that attributions made a significant contribution to predicting mothers' praise over and beyond mothers' successful descriptions of child behaviour and whether or not the mother-son dyad involved a son with ADHD. For example, for both mothers of sons with ADHD and mothers of nonproblem sons, attributions of their child's success to internal uncontrollable stable factors significantly predicted an increased use of praise, and decreased use of criticism also above and beyond the effects of child age, group, and descriptions of success. The lack of significant group by attributions interactions indicated that there were no significant differences in the relationships between mothers' attributions for child behaviour and mothers' responses across mothers of sons with ADHD and mothers of nonproblem sons. However, these results should be interpreted with regards to the limited power to detect such interactions (McClelland & Judd, 1993).

This study sought to obtain a measure of mothers' attributions that realistically reflected their everyday experience with their children. To facilitate this goal, mothers were given little guidance as to what to say during the think aloud or feedback phases of the task. By giving mothers little guidance during these phases, a lot of the information mothers offered was not useful for the purpose of this study. In other words, by providing mothers with little constraint, a lot of experimental noise was created. This experimental noise resulted in, for example, a large number of mothers' phrases being allocated to "other" code categories in both the think aloud (41% for mothers of sons with ADHD and 40% for mothers of nonproblem sons) and feedback

phases (46% for both mothers of sons with ADHD and mothers of nonproblem sons). A further limitation of this study was that the controls for Type I error were relaxed. The rationale for this relaxed Type I error rate, however, was the use of a new task, making the study somewhat exploratory in nature. Thus, future replication of these results using a similar method are recommended. A further statistical limitation of this study was the skew in the distributions of mothers' statements. Another limitation of this study was that it involved only mothers and their sons. Because fathers and girls were not involved, generalization of these results to all parents and children must be limited.

Future research should introduce limitations on the responses that mothers make in this task, while still attempting to elicit realistic attributions from mothers. This study's method restrained mothers only by including a time limit. As well as a time limit, mothers may be prompted with open-ended questions during the think aloud sessions or at the end of the sessions. These timely open-ended questions may mold the content of the mothers' answers to be more in line with the researchers' goals of assessing attributions. The use of prompts would help in cutting down the experimental noise that was problematic in the present study. Future research could also explore father-son dyads, father-daughter dyads, and mother-daughter dyads. Research expanding away from mother-son dyads could provide information regarding differences or similarities between other dyads and the mother-son dyad. Future research should also examine the role of mothers' mood (e.g., mothers' depression) in the generation of mothers' attributions.

The main contributions of this study are two fold. One contribution is the use of a new kind of task to explore mothers' attributions. The main goal of the task was to provide mothers with a realistic context in which to generate attributions regarding their child's behaviour. Past studies (e.g., Johnston et al., 1998) have commented upon the need to provide realistic contexts to test mothers' attributions and their relation to child behaviour. Past studies have tended to rely on the use of hypothetical scenarios of child behaviour to generate mothers' attributions, and the ecological validity of the attributions that are generated have been questioned (Bugental et al., 1998). This study's task was designed to improve the level of ecological validity of the mothers' attributions that were generated. However, it is premature to attempt to answer the question as to whether ecological validity truly has been improved. Further studies using this study's methodology need to be performed to replicate the results of this study and perhaps to refine the method. Once that is done the results of the new methodology can be compared confidently to previous studies that have utilized different methodologies. However, the evidence that some results of this study are congruent with results of past studies using different methodologies suggests some validity for the new task and makes a case for further research. A further

contribution of this study was to show that mothers' attributions for child behaviour predict mothers' responses to child behaviour above and beyond mothers' descriptions of child behaviour and group characteristics. This contribution was especially borne out for mothers' attributions for successful child behaviour in which the impetus for the behaviour originated within the child, was controllable by the child, and was consistent with the child's past behaviour. These attributions predicted that mothers would respond with praise to their child over and beyond mothers' descriptions of their child succeeding in the task and their child's behavioural characteristics. Thus showing that attributions account for unique variance in how mothers' responded to child behaviour.

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