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ORIGINAL EMPIRICAL RESEARCH

Cultural Variations in Mothers' Attributions: Influence of Child Attention-Deficit/Hyperactivity Disorder

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Abstract The attributions made by Chinese immigrant (n = 28) and Euro-Canadian (n = 27) mothers of 5- to 9-year-old boys regarding the causes of child prosocial and problem behaviors exhibited by children with and without attention-deficit/hyperactivity disorder (ADHD) were investigated. Mothers' attributions were elicited using audio-taped scenarios of child behavior. In one-half of the scenarios, the child was described as having ADHD. All mothers attributed less responsibility to the child or to the parent for problem behaviors when the child was described as having ADHD than when the child was described as not having a behavior disorder. Mothers also attributed prosocial child behaviors and the behavior of children without ADHD more to parental factors. In comparison to Euro-Canadian mothers, Chinese immigrant mothers saw children as less responsible for prosocial behavior. Mothers also completed a measure of beliefs about ADHD. Although there were some subtle cultural differences in these beliefs, mothers from both cultural groups endorsed generally accurate beliefs about ADHD. Implications for understanding the cultural uniqueness and similarities of maternal attitudes regarding child behavior and ADHD are discussed.

Keywords ADHD · Parental attributions · Culture

Introduction

Researchers have increasingly focused attention on parental attributions, or causal explanations, for child behavior because the manner in which parents explain their children's characteristics and behaviors has important implications for the parents' immediate emotional and behavioral responses to the child, as well as for long-term parent–child relationship quality [1]. Parental attributions for child behavior appear

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to differ across cultures [2], and such cultural differences may be particularly significant in families of children diagnosed with mental disorders, because parental attributions predict the acceptability and implementation of interventions [3] and partially mediate the relationship between ethnicity and mental health service use [4]. In this study, we focus on the attributions offered by recently immigrated Chinese mothers for the behaviors of children with and without attention-deficit/hyperactivity disorder (ADHD). This focus is grounded in an assumption that Chinese parents may view ADHD symptoms of inattention, impulsivity and hyperactivity as particularly unacceptable and distressing given that the Chinese culture holds higher expectations for inhibition (e.g., impulse control and suppression of aggression) and compliance (e.g., obedience without question) from children in comparison to the European or North American culture [5].

Research with parents of nonproblem children suggests that parental attributions differ across cultural groups and across types of child behavior. Euro-American mothers of children without behavior problems typically demonstrate a child-serving attributional bias in which internal, controllable, and stable factors (e.g., child competence) are credited for positive child behaviors (e.g., achieving goals), whereas external, uncontrollable, and transient factors (e.g., accidents) are given as causes for negative child behaviors [6]. That is, Euro-American mothers view children as more responsible for positive behaviors, but as less responsible for negative behaviors. In contrast, Chinese mothers appear to have less of a child-serving attributional style and instead see children as less responsible for positive behaviors—which are explained instead by external, uncontrollable, and transient factors (e.g., easy task). Conversely, Chinese mothers hold children relatively responsible for negative behaviors or failures, which are attributed to internal, controllable, and stable factors (e.g., child incompetence) [2, 7]. Despite the importance of these studies, they are limited by a focus on attributions for the behavior of nonproblem children in primarily success/failure situations. Further research is needed to explore whether these cultural differences generalize to attributions for the social behaviors of children with their parents, and to attributions for children with diagnosed problems.

There is general agreement regarding the value of understanding the implications of assigning diagnostic labels to children [8, 9], and in this spirit we are interested in how mothers' causal attributions for child behavior are altered by the presence of an ADHD diagnosis, independent of differences in actual child behavior. Madle et al. [10] evaluated the effect a diagnosis of ADHD had on affective responses by asking college students to view videotapes of two preschoolers after being led to believe that one child had ADHD whereas the other child did not. Despite the equivalence of the behaviors displayed in the videos, the presence of the ADHD diagnosis led to more negative ratings of behavior. Koonce et al. [11] also found that teachers made more negative judgments about children's social and attentional skills when the children were labeled with ADHD in comparison to a nonlabeled condition. Interestingly, Cornett-Ruiz and Hendricks [12] found that when children displayed symptoms of ADHD, students and teachers had more negative first impressions of them and made more negative predictions for their future compared to when children did not display ADHD behaviors. However, the use of the ADHD diagnosis by itself had no effect on the ratings of the teachers and peers, with one exception: peers were less critical in evaluating an essay written by the child with the ADHD label. In this case, the label appeared to have lowered expectations, leading to less critical evaluation of the child's performance. In sum, more research is required to resolve,

or to better account for, the inconsistency in findings related to evaluation of child behavior in response to an ADHD diagnosis. Furthermore, the aforementioned studies have used students and teachers as participants and have neglected the involvement of parents.

The effect of an ADHD diagnosis on parents' attributions for child behavior may be estimated from research that has compared attributions for child behavior made by parents of children with ADHD and those made by parents of nonproblem children. Research suggests that Euro-North American parents of children with ADHD adopt a disease-model pattern of attributions in which their children are not held responsible for problem behavior [13, 14]. In addition, these parents hold more pessimistic views of positive child behaviors, being less likely to credit their children for prosocial behaviors and seeing the causes of these behaviors as less dispositional and less durable, in comparison to parents of nonproblem children. Finally, parents of children with ADHD also take less personal responsibility for their children's behavior than do parents of nonproblem children. Taken together, findings suggest that among Euro-North American parents, the experience of parenting a child with ADHD is related to a diminished degree in which parents see either themselves or their children as responsible for the child's difficult behavior. In addition, these attributions are related to parents' more general beliefs regarding the causes and treatments of ADHD. In two studies, Johnston and colleagues [3, 15] found that endorsement of inaccurate beliefs regarding ADHD (i.e., beliefs in diet/vitamin and/or psychological causes/treatments) were associated with attributions of child responsibility for negative behaviors. Despite these associations, it is important to note that, in general, the beliefs of Euro-North American parents in these studies were relatively well informed and knowledgeable. All parents gave strongest endorsement to beliefs in behavioral management and medication treatment of ADHD, and were least likely to endorse beliefs in psychological factors or diet/vitamins as causes or effective treatments.

In contrast to the differences in attributions made by Euro-North American parents of ADHD and nonADHD children, a different story unfolds in the few studies that have examined the attributions of Chinese parents for child mental illness. Although little is known regarding Chinese parents' knowledge and beliefs regarding ADHD specifically, many minority groups, including Chinese individuals, in comparison to Euro-North American populations, view behavior disorders or problems from a broader perspective that encompasses spiritual, moral, somatic, psychological, and metaphysical causes [16]. Ryan and Smith [17] examined Chinese–American parents' reactions to their 5 to 9-year-old children's developmental disabilities and found that Chinese–American parents demonstrated more guilt that was associated with increased attributions of child responsibility and parental self-blame for the child's condition in comparison to Euro-American parents. At the same time, Chinese–American parents had a threefold causal conception of disease, attributing problems to physical agents, supernatural agents (e.g., fate), and metaphysical causes (e.g., cosmology, yin and yang), as well as perceiving disability as a temporary problem. Similarly, Yeh et al. [18] found that Asian/Pacific Islander–American parents were more likely to attribute their children's mental health problems (e.g., alcohol/drug, serious emotional disturbance) to external factors such as the influence of popular American culture and racial discrimination, whereas non-Hispanic white American parents were more likely to place the blame on in-born physical health problems or disabling conditions, the child's personality,

family conflict, and trauma. In sum, results across studies offer a conflicting picture of the beliefs and attributions for child disorders made by Chinese parents. Although Chinese parents may see the problem behavior of a child with a disability as due to broad external and uncontrollable causes, they nonetheless make attributions that hold the child and themselves more responsible for the child's behavior than do Euro-North American parents. Further research is needed to understand this apparent discrepancy in causal attributions within Chinese parents, and to compare the attributions and beliefs of Chinese immigrant and Euro-North American parents.

This study investigates attributions made by Chinese immigrant and Euro-Canadian mothers regarding prosocial and ADHD child behaviors and the effect of the child being diagnosed with ADHD. We also assessed more general beliefs regarding ADHD in these two groups. We focused on mothers of sons, as mothers play a primary role in child socialization [19] and ADHD symptoms are more common among boys than girls [20]. Although it will be important to assess cultural differences in attributions made by mothers of children diagnosed with ADHD, we focus on mothers of nonproblem boys as interesting insight can be gained from this population. Given the prevalence rates of ADHD, which are comparable in Chinese and Canadian populations [21, 22], approximately 5% of mothers of nonproblem children may face their child being diagnosed with ADHD in the future. More importantly, the attributions offered by Chinese immigrant mothers, regardless of their own child's diagnostic status, provide insight into the cultural context in which Chinese children with ADHD and their families function and how this may differ from the attributions offered for ADHD among Euro-Canadian families. Generalizing from studies comparing Euro-American and Chinese parents of nonproblem children, and the limited literature on Chinese parents' attributions for behavior disorders, it is expected that Chinese immigrant mothers will attribute more responsibility to the child and themselves for problem behaviors and less for prosocial behaviors in comparison to Euro-Canadian mothers, and that this difference will be even greater when the child has been labeled with ADHD. Moreover, it is expected that Euro-Canadian mothers will more strongly endorse accurate beliefs regarding ADHD, whereas Chinese immigrant mothers would hold a greater variety of beliefs, both evidence-based beliefs and others.

Method

Participants

Eighty-seven mothers of boys between the ages of 5 and 9 years were recruited by posting notices in community centers, school newsletters, and a shopping mall. The data from 20 mothers were excluded from the final analyses due to failure to meet inclusion criteria (e.g., mothers of Chinese heritage who were born in Canada, or whose primary identification was with mainstream culture). In addition, nine mothers failed to show up to appointments, and three mothers declined participation. Thus, the final sample used in this study consisted of 55 mothers. There were two groups of participants, selected to be differentiated by culture, but all residing in Canada. There were 27 mothers of Western European descent who either were born

in Canada or had immigrated to Canada before the age of 18 years. The group of Chinese immigrant mothers was composed of 28 mothers who were born in the country of their heritage descent, and had immigrated to Canada after the age of 18 years. Of the Chinese mothers, 17 were born in mainland China, 10 were born in Hong Kong, and one was born in Taiwan. As expected, Chinese mothers spent significantly less time living in Canada than Euro-Canadian mothers, $t(53) = 14.75$, $p < 0.001$. Although demographic indicators, such as years lived in a new country, are simple and often useful in identifying acculturation status, they fail to account for numerous individual differences and other factors affecting the rate of adaptation to the new culture, such as pre-migration exposure to the mainstream culture, residence in an ethnic neighborhood, willingness to seek language education, and frequency of contact with individuals from the mainstream culture [23]. Thus, in order to ensure homogeneity in the acculturation status of the Chinese immigrant group, only mothers who identified more with their heritage culture than the mainstream culture were included (as defined on the Vancouver Index of Acculturation described below).

The majority of mothers were married (84%), with a mean age of 39.27 years (SD = 5.78). If mothers had more than one son between the ages of 5 and 9 years, the one who was closest to 7 was chosen as the target child. The average age of the mothers' sons was 7.28 years (SD = 1.42) and all mothers reported that their sons had not been diagnosed with any major physical, mental, or behavioral condition or disorder. Families had an average of two children (SD = 0.98) and family socioeconomic status (SES) was predominantly middle-class based on the Hollingshead [24] Four-Factor Index of Social Status ($M = 37.05$, SD = 12.54). Comparisons between groups yielded significant differences only for the number of children in the family, $t(53) = 2.62$, $p < 0.05$, and SES, $t(53) = 3.90$, $p < 0.001$. Euro-Canadian mothers had more children and a higher SES score than the Chinese immigrant mothers. Descriptive information for the groups is presented in Table 1.

Table 1 Descriptive information for Euro-Canadian and Chinese immigrant mothers

Variable	Euro-Canadian ($n = 27$)		Chinese immigrant ($n = 28$)	
	M	SD	M	SD
Mother age (in years)	39.15	5.74	39.39	5.91
Target child age (in years)	7.15	1.46	7.41	1.40
Number of children in the family	2.41	0.97	1.75	0.89
Socioeconomic status	43.02	10.02	31.29	12.16
Years lived in Canada	36.54	8.54	7.34	5.95
Heritage culture identification[a]	–	–	6.90	0.95
Mainstream culture identification[a]	–	–	5.65	0.86
Child emotional symptoms[b]	1.81	2.13	2.00	2.19
Child hyperactivity/inattention[b]	4.96	2.53	3.18	2.63
Child prosocial behavior[b]	7.37	2.51	7.75	1.62
Child total difficulties[b]	10.96	5.29	8.04	5.74

[a] Scores from the Vancouver Index of Acculturation

[b] Scores from the Strengths and Difficulties Questionnaire

Measures

All measures and audio-taped scenarios were first devised in English, and then translated into both Cantonese and Mandarin. Translation guidelines suggested by van Widenfelt and colleagues [25] were followed. Four native Cantonese speakers who were trilingual and bicultural were involved. Back-translations and a final review of all translations were conducted to ensure both cultural and clinical appropriateness of the measures. Mothers were given the option of which language version of the measures they preferred to ensure similar levels of understanding among cultural groups.

Strengths and Difficulties Questionnaire (SDQ) [26]

To control for potential differences across groups in perceived child psychological adjustment, mothers completed the SDQ—a brief behavioral screening questionnaire that asks parents of children ages 4–10 years about 25 attributes of their child's behavior. Items are rated on a three-point Likert scale (not true, somewhat true, and certainly true) and represent five scales of five items each, generating scores for conduct problems, hyperactivity, emotional symptoms, peer problems, and prosocial behavior. This scale has demonstrated acceptable psychometric properties [27]. Reliability of this scale is generally satisfactory, whether judged by internal consistency (mean Cronbach $\alpha = 0.73$), cross-informant correlation (mean = 0.34), or retest stability after 4–6 months (M = 0.62). SDQ scores above the 90th percentile predict a substantially raised probability of independently diagnosed psychiatric disorders (mean odds ratio = 15.7). In this sample, Cronbach αs were 0.78 for the emotional symptoms subscale, 0.57 for the conduct problems subscale, 0.84 for the hyperactivity/inattention subscale, 0.43 for the peer relationship problems subscale, and 0.74 for the prosocial behavior subscale. Given the low values for conduct problems and peer relationship problems, scores on these scales were not used in analyses. Scores on the SDQ for Chinese immigrant and Euro-Canadian mothers are presented in Table 1. Euro-Canadian mothers reported higher levels of child hyperactivity/inattention than Chinese mothers, $t(53) = 2.56$, $p < 0.05$, but no other significant differences emerged.

Vancouver Index of Acculturation (VIA) [23]

The VIA was used to ensure a homogeneous group of Chinese immigrant mothers who displayed similar levels of acculturation. It is a 20-item self-report instrument designed to assess several domains relevant to acculturation, including values, social relationships, and adherence to traditions. Items were generated in pairs with regard to content area, with one item in each pair referring to the heritage Chinese culture and the other item referring to mainstream North American culture. Each item is rated on a nine-point scale ranging from 1 (*strongly disagree*) to 9 (*strongly agree*). Two subscale scores are computed, with one score signifying level of identification with the heritage culture and another score signifying level of identification with the mainstream culture. Satisfactory psychometric properties have been demonstrated for this measure [23]. Both the heritage and mainstream dimensions are highly internally consistent (αs = 0.91, and 0.89, respectively). Both subscales also yield significant correlations with several concurrent validity indicators, including

percentage of time lived in Canada, generational status, and Western identification (mean *r*s = –0.37 for the heritage subscale, and 0.47 for the mainstream subscale) [23]. In this sample, Cronbach αs for the VIA were 0.89 for the heritage subscale, and 0.85 for the mainstream subscale.

Audio-taped scenarios of child behavior

Although many parental attribution measures use hypothetical events presented as written vignettes [28], scenarios describing child behavior in this study were presented via audiotape. As an attempt to access mothers' first impressions and prevent them from over-analyzing the situation, mothers were only able to listen to each scenario once rather than being able to read and re-read scenarios at their own pace. Moreover, this presentation manner may be more characteristic of "live" situations where mothers must react immediately to children's behavior.

Sixteen short audio-taped scenarios were used to describe behaviors characteristic of 5 to 9-year-old boys. A pilot study was conducted to ensure that mothers viewed the behaviors as characteristic of boys of this age and as applicable to both the Chinese and Euro-Canadian cultures. The scenarios consisted of two or three simple sentences and no mothers from either cultural groups indicated a lack of understanding of vignettes. There were eight scenarios describing problematic ADHD behaviors and eight describing prosocial behaviors.[1] The descriptions of problem behaviors were adapted from the DSM-IV criteria for ADHD [20]. Each scenario described a single hyperactive-impulsive or inattentive symptom of ADHD (e.g., interrupting others, having difficulty waiting a turn, being easily distracted). Prosocial behavior scenarios were rationally developed to match the problem behavior scenarios in length and detail. For instance, boys in these scenarios were described as considerate, willing to help without being asked, well-behaved, or well-mannered. Two female research assistants recorded all scenarios.

Prior to playing the scenarios for mothers, a standard, brief description of the symptoms, but not the causes, of ADHD was offered to ensure that all mothers would know the definition of ADHD. ADHD was described as referring to a pattern of behavior exhibited by children who are easily distracted, interrupt or intrude on others, or fidget with their hands and feet or squirm in their seat. Moreover, the description indicated that children with ADHD display these characteristics more often than other children their age, and that they often have difficulties relating to their family and friends, and difficulties with schoolwork. Mothers were requested to imagine themselves as the mother of the children described in the scenarios. Half of the scenarios (four prosocial and four problem behaviors) were both verbally and visually (i.e., using a sign) identified as describing children diagnosed with ADHD, and the other eight scenarios were identified as describing nonproblem children. That is, in order to help the mothers keep track of whether the child being described in each scenario had ADHD or not, before playing the audiotape, the research assistant stated aloud and placed a sign on the table to identify whether the child in the next scenario had ADHD or not. Diagnostic conditions were counterbalanced across scenarios, and were presented in random order across mothers.

[1] The scenarios are available from the author upon request.

Dimensional Attributions Questionnaires (DAQ)

Immediately after listening to each scenario, mothers made ratings on five 10-point Likert-type scales that assessed multiple dimensions of causal attributions (e.g., responsibility, blame) for child behavior. This measure was adapted from Johnston and Freeman's [14] Written Analogue Questionnaire (WAQ) and Provencher and Fincham's [29] Attribution Scale for Symptom Behaviors (ASSB), both of which have demonstrated adequate reliability estimates (αs for ratings across four scenarios ranging from 0.49 to 0.83 (Freeman W, Johnston C submitted); and test–retest reliability ranging from 0.60 to 0.73 [29]). The WAQ also has demonstrated sufficient validity: correlating significantly with attributions offered in recalled incident interviews and video-mediated recall formats (mean rs = 0.24 and 0.23, respectively) and with affective and behavioral responses to child behavior (mean rs = 0.33 and 0.40, respectively), and being sensitive to group status (e.g., clinical versus non-clinical samples, and medicated versus unmedicated samples) and behavior type differences (e.g., inattentive–overactive, oppositional–defiant, and prosocial child behaviors) [14]. The ASSB also was found to be sensitive to differences in attributions for positive and negative behaviors [29].

The front page of the DAQ contained an explanation of the causal attribution dimensions and an example of their use. Mothers went through this front page together with the research assistant prior to listening to the scenarios. Although several dimensions of parental attributions have been investigated in previous research, it has been suggested that responsibility is a product or summation of many of these, including internality, intent, and controllability [29] and responsibility attributions are most strongly associated with behavioral responses [30]. Thus, for the purposes of this study, responsibility attributions serve as the primary variable of interest. Responsibility attributions were rated on a 10-point scale ranging from 1 (*not at all responsible*) to 10 (*completely responsible*). Four other 10-point scales assessed causal attributions of: controllability (1: *not at all controllable* to 10: *completely controllable*), intentionality (1: *not at all intentional* to 10: *completely intentional*), and blame or credit ascribed to both the child and the parents (1: *not at all to be blamed/deserves credit* to 10: *completely to be blamed/deserves credit*) for problem or prosocial child behaviors, respectively. The final scale asked for the mother's affective response to the child's behavior, which was rated on a 10-point scale ranging from 1 (*extremely upset*) to 10 (*extremely pleased*). As there were four scenarios for each of the four conditions (i.e., ADHD diagnosis with problem behavior, ADHD diagnosis with prosocial behavior, no diagnosis with problem behavior, no diagnosis with prosocial behavior), an average score for each of the five attribution scales and the one affective response scale on the DAQ was computed across these four scenarios. Estimates of internal consistency for the DAQ are presented in the Results.

ADHD beliefs scale [3]

This 27-item measure assessed mothers' beliefs regarding the causes of and treatments for ADHD. Items are rated on a seven-point Likert scale from 1 (*disagree*) to 7 (*agree*) and represent four scales: Belief in Behavior Management, Belief in Medication, Belief in Psychological Causes/Treatments, and Beliefs in Diet/Vitamin Treatments. This scale has acceptable psychometric properties [3], with Cronbach αs

for the scales ranging from 0.71 to 0.79. In this sample, Cronbach αs were 0.84 for the Belief in Behavior Management subscale (eight items), 0.81 for the Belief in Medication subscale (five items), 0.82 for the Belief in Psychological Causes/Treatments subscale (four items), and 0.68 for the Beliefs in Diet/Vitamin subscale (four items).

Procedure

When mothers contacted the laboratory, a research assistant described the study, in the preferred language of the mother (i.e., either English, Mandarin, or Cantonese), and if mothers were interested in participating, a brief phone screening was conducted to determine whether they met demographic inclusion criteria. Mothers had the option of participating at the Parenting Lab in the Department of Psychology at University of British Columbia (UBC), or in their own home. Seventy-four and a half percent of mothers participated at UBC and there was no significant difference in the location of visit across cultural groups, $t(53) = -0.22$, $p > 0.05$.

Mothers provided written consent for participation and then completed questionnaires on demographic information and child adjustment. Next, mothers listened to the 16 audio-taped scenarios describing child behavior. Immediately after each scenario, mothers answered the six questions on the DAQ. After listening to all scenarios, mothers rated, on a 10-point scale how easy (1) to hard (10) it was to imagine being the mother of the children described in the scenarios. Chinese mothers (M = 4.11, SD = 2.28) gave significantly higher ratings than Euro-Canadian mothers (M = 2.56, SD = 1.62), $t(53) = -2.89$, $p < 0.01$. Finally, Chinese-immigrant mothers completed the acculturation questionnaire (also used as an inclusion criterion). A research assistant was present throughout the administration of the study, to ensure that all mothers had equal opportunity to ask for clarification at any time.

Results

Preliminary analyses and data reduction

Scores on the measures were generally normally distributed, with skewness and kurtosis levels less than 1.00. None of the mothers were missing data for a complete questionnaire; thus, scores were adequately computed using the means of the acquired data.

On the DAQ, significant correlations between responsibility, controllability, intentionality, and child blame attributions (ranging from 0.43 to 0.76) suggested that these dimensions could be averaged into one single variable, termed responsibility. This approach is consistent with previous literature suggesting that responsibility is a product or summation of other causal attributions, including intent and control [29]. Because attributions of parental blame/credit were not significantly correlated with the majority of other causal ratings (correlations with responsibility, controllability, and intentionality were all nonsignificant and ranged from 0.04 to 0.21, and the correlation with child blame/credit was 0.37), parental blame/credit attributions remained as a separate dimension for analysis. Mean Cronbach αs for the ratings on the four DAQ scenarios describing problem behaviors in ADHD children were 0.67 (range from 0.43 to 0.86) for responsibility and 0.75 (range from 0.35 to 0.91) for

parental blame/credit, and 0.70 (range from 0.52 to 0.85) for affective responses. For the four scenarios describing prosocial behaviors in ADHD children, the mean alphas were 0.81 (range from 0.70 to 0.92) for responsibility and 0.82 (range from 0.69 to 0.98) for parental blame/credit, and .59 (range from 0.33 to 0.86) for affective responses. For the four scenarios describing problem behaviors in nonproblem children, alphas averaged 0.74 (range from 0.56 to 0.99) for responsibility and 0.75 (range from 0.67 to 0.82) for parental blame/credit, and 0.71 (range from 0.47 to 0.84) for affective responses; and for the four scenarios of prosocial behaviors in nonproblem children, the mean alphas were 0.74 (range from 0.61 to 0.85) for responsibility and 0.73 (range from 0.33 to 0.93) for parental blame/credit, and 0.57 (range from 0.50 to 0.84) for affective responses.[2]

Examination of possible covariates

To assess whether cultural differences might be due to differences on other indices, several possible covariates were considered. To be used as a covariate in the analyses, variables had to be significantly different between the two cultural groups, had to correlate significantly with the dependent variable, and the effect of the covariate had to be significant in the mixed analysis of variance [31]. Number of children in the family, SES, SDQ hyperactivity/inattention scores, and imagination difficulty scores were significantly different between Chinese immigrant and Euro-Canadian mothers. However, number of children and SDQ hyperactive/inattention did not significantly correlate with responsibility attributions or ADHD beliefs, nor were the effects of these variables or imagination difficulty scores significant in the ANCOVAs. Therefore, these variables are not discussed further. SES was significantly correlated with responsibility attributions for prosocial child behavior in both nonproblem, $r(53) = 0.36$, $p < 0.01$, and ADHD children, $r(53) = 0.35$, $p < 0.01$, as well as significantly correlated with Belief in Psychological Causes/Treatments, $r(53) = -0.30$, $p < 0.05$, and was considered as a covariate in the ANOVAs as described below.

Responsibility attributions

A three-way mixed ANOVA was conducted to examine differences in responsibility attributions for child behavior between cultural groups (Euro-Canadian and Chinese immigrant), diagnosis (ADHD versus nonproblem), and type of child behavior (problem versus prosocial). The main effects of cultural group, $F(1, 53) = 5.86$, $p < 0.05$, $\eta^2 = 0.10$, diagnosis, $F(1, 53) = 17.71$, $p < 0.001$, $\eta^2 = 0.25$, and child behavior type, $F(1, 53) = 189.88$, $p < 0.001$, $\eta^2 = 0.78$, were significant. These main effects were qualified by significant two-way interactions between child behavior type and diagnosis, $F(1, 53) = 5.13$, $p < 0.05$, $\eta^2 = 0.09$, as well as between child behavior type and cultural group, $F(1, 53) = 7.28$, $p < 0.01$, $\eta^2 = 0.12$. The

[2] The 16 scenarios used in the Dimensional Attributions Questionnaire were counterbalanced across ADHD diagnosis in six different combinations. Thus, across mothers, six sets of four problem behavior scenarios described children with ADHD, six sets of four prosocial behavior scenarios described children with ADHD, six sets of four prosocial behavior scenarios described nonproblem children, and six sets of four problem behavior scenarios described nonproblem children were used. Internal consistency for each attributional dimension rating was calculated separately for each set of scenarios.

two-way interaction between cultural group and diagnosis, as well as the three-way interaction between cultural group, diagnosis, and type of child behavior were not significant. Table 2 presents the means and standard deviations of mothers' attributional ratings.

Follow-up tests of the interaction between child behavior type and diagnosis were conducted looking at the effect of the ADHD diagnosis for problem and prosocial behaviors separately. For problem child behaviors, the simple main effect of diagnosis was significant, $F(1, 53) = 16.80$, $p < 0.001$, $\eta^2 = 0.24$, with mothers attributing less responsibility to the child for problem behaviors when the child was described as having an ADHD diagnosis (M = 5.75, SD = 0.17) than when the child was described as not having any behavior disorders (M = 6.59, SD = 0.17). For prosocial behaviors, no significant difference in responsibility attributions was found across the ADHD and no diagnosis scenarios. Follow-up tests of the interaction between child behavior type and cultural group were conducted separately for problem and prosocial behaviors. For prosocial child behaviors, there was a significant simple main effect of cultural group, $F(1, 53) = 11.37$, $p < 0.01$, $\eta^2 = 0.18$. In comparison to Euro-Canadian mothers (M = 9.00, SD = 0.21), Chinese immigrant mothers (M = 8.01, SD = 0.21) saw the child as significantly less responsible for prosocial behaviors. However, no significant cultural difference in responsibility attributions was found for problem child behaviors.

When effects for cultural group were considered with SES included as a covariate in the three-way mixed ANOVA, the two-way interaction between child behavior type and cultural group remained significant, $F(1, 52) = 5.10$, $p < 0.05$, $\eta^2 = 0.09$. This suggests that variations in attributions that emerged reflect adherence to different cultural belief systems rather than SES.

Parental blame/credit attributions

A separate three-way mixed ANOVA was conducted to examine differences in parental blame/credit attributions between cultural groups, diagnosis, and type of child behavior. Significant main effects of child behavior type, $F(1, 53) = 43.35$, $p < 0.001$, $\eta^2 = 0.45$, and diagnosis, $F(1, 53) = 5.43$, $p < 0.05$, $\eta^2 = 0.09$ were found. Overall, mothers attributed more credit to parental factors for prosocial child behaviors (M = 6.53, SD = 0.28) than they attributed parental blame for problem

Table 2 Attributional ratings for problem and prosocial behaviors of children diagnosed with or without ADHD in Euro-Canadian and Chinese immigrant mothers

Child behavior type	Euro-Canadian (n = 27)		Chinese immigrant (n = 28)	
	ADHD Mean (SD)	Nonproblem Mean (SD)	ADHD Mean (SD)	Nonproblem Mean (SD)
Child responsibility				
Problem behavior	5.77 (0.88)	6.65 (1.12)	5.73 (1.50)	6.54 (1.32)
Prosocial behavior	8.91 (1.03)	9.10 (0.85)	7.83 (1.51)	8.20 (1.40)
Parental blame/Credit				
Problem behavior	4.65 (1.93)	4.88 (1.96)	4.40 (1.97)	4.66 (2.16)
Prosocial behavior	6.49 (1.85)	6.74 (1.91)	6.26 (2.57)	6.64 (2.43)

Note. Scores from the Dimensional Attributions Questionnaire (DAQ) can range from 1 to 10, with higher scores reflecting stronger attributions

child behaviors (M = 4.65, SD = 0.26). In addition, mothers attributed more parental blame/credit for the behavior of children who were described as having no behavioral problems (M = 5.73, SD = 0.23) than for the behavior of children who were described as diagnosed with ADHD (M = 5.45, SD = 0.24). No significant main effect of culture was found, nor were any of the interactions significant. Refer to Table 2 for means and standard deviations of mothers' parent blame/credit attributions.

Relations between responsibility attributions and affective responses

Responsibility attributions made by all mothers, collapsed across scenarios depicting both ADHD and nonproblem children, were significantly correlated with affective responses, $r(53) = -0.50$, $p < 0.001$, for problem child behaviors, and $r(53) = 0.32$, $p < 0.05$, for prosocial child behaviors. A similar pattern of correlations was displayed by both Euro-Canadian mothers, $r(25) = -0.21$, $p > 0.05$, and $r(25) = 0.13$, $p > 0.05$, and Chinese immigrant mothers $r(26) = -0.53$, $p < 0.01$, and $r(26) = 0.35$, $p = 0.07$, for problem and prosocial child behaviors, respectively.

ADHD beliefs

A repeated-measures ANOVA was conducted with cultural group as the between variable and belief scores as the repeated variable. The main effect of ADHD beliefs was significant, $F(3, 51) = 105.20$, $p < 0.001$, $\eta^2 = 0.86$, and was qualified by a significant interaction between beliefs and cultural group, $F(3, 51) = 14.42$, $p < 0.001$, $\eta^2 = 0.46$. The main effect for cultural group was not significant. As a follow-up to the interaction, simple main effects analyses were conducted to examine differences in beliefs between cultural groups (Euro-Canadian and Chinese immigrant) (see Table 3). Significant differences were found for all of the four scales. Compared to Euro-Canadian mothers, Chinese immigrant mothers scored lower on Belief in Behavior Management, $F(1, 53) = 4.92$, $p < 0.05$, $\eta^2 = 0.09$, higher on Belief in Medication, $F(1, 53) = 12.37$, $p < 0.01$, $\eta^2 = 0.19$, higher on Belief in Psychological Causes/Treatment, $F(1, 53) = 12.02$, $p < 0.01$, $\eta^2 = 0.19$, and lower on Belief in Diet/Vitamin Treatment, $F(1, 53) = 8.66$, $p < 0.01$, $\eta^2 = 0.14$.

In addition, simple main effects were conducted examining differences among the four belief scales within each cultural group. For Euro-Canadian mothers, the simple main effect of beliefs was significant, $F(3, 51) = 77.22$, $p < 0.001$, $\eta^2 = 0.82$, with

Table 3 ADHD beliefs in Euro-Canadian and Chinese immigrant mothers

Scales	Euro-Canadian ($n = 27$)		Chinese immigrant ($n = 28$)	
	M	SD	M	SD
Belief in Behavior Management	6.47	0.55	5.97	1.03
Belief in Medication	3.35	0.93	4.48	1.40
Belief in Psychological Causes/Treatments	2.43	1.31	3.64	1.29
Beliefs in Diet/Vitamin Treatments	4.81	0.91	3.98	1.17

Note. Scores on the ADHD Beliefs Scale can range from 1 to 7, with higher scores indicating greater endorsement of beliefs

mothers scoring highest on Belief in Behavior Management, followed by Beliefs in Diet/Vitamin Treatment, then Belief in Medication, and lowest on Belief in Psychological Causes/Treatments. A similar pattern of beliefs was found among Chinese immigrant mothers, in which the simple main effect of beliefs was significant, $F(3, 51) = 41.76$, $p < 0.001$, $\eta^2 = 0.71$. Chinese immigrant mothers scored highest on Belief in Behavior Management, followed by Belief in Medication, and lowest on Belief in Psychological Causes/Treatment and Diet/Vitamin Treatment. When effects for cultural group were considered with SES included as a covariate in the ANOVA, the interaction between beliefs and cultural group remained significant, $F(3, 48) = 10.95$, $p < 0.001$, $\eta^2 = 0.41$, suggesting that variations in ADHD beliefs reflect adherence to different cultural belief systems.

Discussion

As predicted, all mothers attributed less responsibility to the child when the child was described as having an ADHD diagnosis than when the child was described as not having any behavior disorders. However, this difference was only found in relation to problem child behaviors, but not for prosocial child behaviors. Thus, previous findings indicating that mothers were more willing to excuse the problem behaviors displayed by children with ADHD than the problem behaviors displayed by nonproblem children were replicated [13, 14]. On the other hand, contrary to hypotheses and previous literature, results from this study found that mothers were equally likely to give credit to both groups of children for prosocial behaviors. Furthermore, in support of the hypotheses related to cultural differences, in comparison to Euro-Canadian mothers, Chinese immigrant mothers attributed less responsibility to the child for prosocial behavior, which is in accord with previous findings on cultural differences in child-serving attributional bias for positive behaviors [2, 6]. However, the prediction that Chinese immigrant mothers would hold the child more responsible for problem behavior compared to Euro-Canadian mothers was not supported. Thus, there did not appear to be cultural differences in child-serving attributional bias for negative child behaviors in this sample.

No interaction effect between diagnosis and culture emerged in the attributions made for prosocial and problem child behaviors. To our knowledge, this study is the first to investigate possible cultural differences in attributions offered for ADHD and nonproblem children. The lack of a significant interaction suggests that both cultural groups are interpreting the influence of ADHD in a similar fashion when attributions are assessed regarding specific child behaviors. When broader beliefs in the causes of and treatments for ADHD were assessed, subtle cultural differences emerged, with Euro-Canadian mothers more likely to endorse beliefs in behavior management and diet/vitamins in the treatment of ADHD and less likely to endorse beliefs in medication and psychological causes/treatments in comparison to Chinese immigrant mothers. However, mothers of both cultural groups demonstrated a similar overall pattern of beliefs, with beliefs in behavioral treatments and causes most apparent, and beliefs in psychological causes or treatments least apparent.

Impact of ADHD diagnosis

The mothers in this study appeared to hold a relatively nonblaming attitude toward problem behaviors when displayed by children diagnosed with ADHD. Furthermore, they did not appear to discount the prosocial behaviors of children with ADHD. Although the failure to detect this effect could be an issue of limited power (the effect had a probability level of $p = 0.14$), the effect size was small ($\eta^2 = 0.04$). These findings suggest that the impact of ADHD labeling on mothers' attributions may not be as negative as previously suggested [10, 11]. Rather, results appear to be more consistent with the idea that the diagnosis of ADHD may create lower expectations for behavior, leading to less critical evaluation [12, 32]. In fact, there may be a positive impact of labeling, in which not only do mothers appear to be less critical of the problem behaviors of a child with ADHD, they are not pessimistic about the prosocial behaviors of the child. Given that some of the mothers in this sample could face the possibility of their child being diagnosed with ADHD in the future, these findings may have positive implications for mother–child relationship quality in such families. Our findings are somewhat in contrast to previous research showing that parents of children diagnosed with ADHD have a more pessimistic view of positive child behaviors compared to parents of nonproblem children [13, 14]. This suggests that parents of children with ADHD may develop increasing pessimism and/or frustration over the years, or may have a more realistic attributional outlook regarding the causes of their child's behavior compared to parents of nonproblem children. It would be helpful for future research to investigate the process through which parents' attributions may change as the child is diagnosed with ADHD. How and when does this change come about? Are there any protective or risk factors associated with this change?

This study uniquely contributes to understanding of the impact of an ADHD diagnosis on attributions across cultural groups. The impact of the ADHD label on the attributions of Chinese immigrant mothers was similar to the impact for Euro-Canadian mothers. One possible reason for the similar impact could be that the Chinese immigrant mothers were acculturated to the mainstream Canadian culture, perhaps having gained a similar understanding and knowledge of ADHD as Euro-Canadian mothers. Future research looking more closely at the process of acculturation among Chinese–Canadian families or studying families who are even more recent immigrants than the mothers in this study may provide insight into whether and how the impact of an ADHD label may change with acculturation. In sum, the pattern of similar attributions for ADHD across Euro-Canadian and Chinese immigrant mothers found in this study has positive implications for Chinese–Canadian families with children diagnosed with ADHD. That is, the other members of the Chinese–Canadian community (e.g., the mothers of nonproblem children who participated in this study) are likely to hold a nonblaming and nonpessimistic attitude toward the behavior of children with ADHD, and such perceptions may minimize any negative impact from the community on the lives of children with ADHD and their families (e.g., providing a sense of acceptance and understanding to families of children with ADHD) [33, 34].

Cultural differences in child-serving attributional bias

Although the Euro-Canadian mothers in this study demonstrated a child-serving attributional bias as has been found in previous literature [6], Chinese immigrant

mothers demonstrated less of this child-serving bias for prosocial child behaviors, but were not different in attributions for problem child behaviors. If social desirability is related to an individual's desire to conform to the values of the society to which she belongs [35], cultural differences in social desirability might account for the failure of Chinese immigrant mothers to assign even greater child blame for the problem behaviors in this study. However, contrary to this argument, previous literature suggests no difference in socially desirable responding between Asian-Canadian and Euro-Canadian individuals [36].

Alternately, it is possible that attributions for positive child behaviors are more culturally engrained than those for negative child behaviors, and therefore, the Chinese immigrant mothers, through acculturation, have acquired similar attributions for problem child behaviors as Euro-Canadian mothers, but their attributions for prosocial child behavior remained more closely associated with the heritage Chinese culture. It is difficult to compare the current results to previous studies demonstrating that Chinese mothers have a less child-serving attributional bias than Euro-American mothers, as many previous studies have been limited to focusing on success/failure situations for nonproblem children [2], rather than on prosocial/problem behaviors displayed by children with and without ADHD, as was done in this study. Perhaps Chinese immigrant mothers view the problem behaviors used in this study (i.e., ADHD symptoms) differently than a child's failure in academic-type situations. If higher demands for inhibition and compliance among Chinese immigrant mothers, as suggested by Julian and colleagues [5], apply primarily to academic situations rather than more general child behaviors, then Chinese immigrant mothers may not have been unduely distressed by the ADHD-problem behaviors used in this study.

Attributions to parental factors

Although the majority of previous literature centered on, and the main focus of this project was on, maternal attributions to child factors, examinations of attributions for child behavior to parental factors displayed interesting findings. Overall, consistent with findings from Johnston and Freeman [14], mothers attributed more parental blame/credit for the behavior of children who were described as having no behavioral problems than for the behavior of children with ADHD. This is in line with the idea that parents, both Euro-Canadian and Chinese immigrant mothers in this study, make attributions for symptoms of ADHD that are generally consistent with the chronic disease models [37].

In addition, this study uniquely contributes to the understanding of attributions of parental factors for child behavior. Mothers attributed more credit to parental factors for prosocial child behaviors than did they attribute parental blame for problem child behaviors. This suggests that not only is it possible to have a child-serving attributional bias, mothers may also demonstrate a parent-serving attributional bias. In fact, this bias appears to be similar between Euro-Canadian and Chinese immigrant mothers. Although this is contrary to previous findings indicating that Japanese and Japanese immigrant mothers take more personal responsibility than Euro-American mothers for failures and unsuccessful parenting situations [38], and less responsibility for successful situations [39], it is consistent with findings demonstrating that Japanese individuals display a markedly attenuated self-serving attributional bias, whereas Chinese individuals display a self-serving attributional

bias that is comparable to American individuals [40]. Thus, although much previous cross-cultural research has grouped individuals from diverse cultural backgrounds into broad categories (e.g., Asian Pacific Islander), these results suggest that it is important to distinguish among specific cultures as they are likely uniquely different from each other in patterns of attributions for both self and child.

Beliefs regarding ADHD

Contrary to our predictions, mothers from both cultural groups were most likely to endorse behavioral causes or treatments of ADHD, and least likely to endorse beliefs in less empirically-validated psychological factors as causes or appropriate treatments for this disorder. This general accuracy of beliefs is similar to previous findings [3], and encouraging as it has been shown to be related to the acceptability and implementation of appropriate interventions [3] and positive child self-esteem [15].

Within the broad similarities in beliefs, cultural differences were found indicating that Chinese immigrant mothers were more likely to believe in medication and psychological factors, while Euro-Canadian mothers were more likely to endorse behavioral and diet factors. The endorsement of both medical and psychological causes of ADHD among the Chinese immigrant mothers is consistent with previous literature showing the endorsement of a range of causal beliefs in this group [16–18]. These cultural differences in beliefs regarding ADHD, combined with the cultural differences in attributions for prosocial and problematic child behaviors, signify the need to evaluate both specific attributions and general beliefs regarding ADHD, and to consider both in ensuring that our understanding of parental cognitions and their implications for treatment planning is culturally sensitive.

Future directions

Maternal attributions have important implications for the mothers' emotional and behavioral responses to the child. In confirmation of this, in this study, the more responsible a mother viewed the child, the more she was upset (for problem behaviors) or pleased (for prosocial behaviors). It would be helpful for future research to extend the relations between attributions and emotional responses to behavioral reactions and the impact on more general aspects of the mother–child relationship. For instance, observations of cultural differences in mothers' reactions to child behavior (e.g., coping or discipline strategies) could be investigated in relation to maternal attributions, and how the mother–child relationship may be differentially impacted depending on the child's attributions of the mothers' intentions.

Cultural comparisons in this study were conducted between only two groups: Euro-Canadian and Chinese immigrant mothers. Although Chinese immigrant mothers identified more strongly with their heritage culture than the mainstream culture, these mothers differ in acculturation from Chinese mothers residing in their country of origin, either because they have assimilation into the mainstream North American society and/or because they held different values/beliefs even prior to immigration. A more detailed understanding of the process of acculturation could be gained by comparing mothers at different stages of acculturation. Future research would likely benefit from comparing attributions between Chinese mothers residing in their country of origin, Chinese immigrant mothers, Chinese–Canadian mothers

(i.e., those who immigrated to Canada before the age of 18 years as well as identifying more strongly with mainstream culture than heritage culture), and Euro-Canadian mothers.

As causal attributions for child behavior differ in parents of children with behavior disorders compared to parents of children without behavior problems [14, 41], research needs to examine differences in the attributions offered by Chinese–Canadian mothers of children with and without ADHD, and how such differences may be linked to responses to the child and to mental health service use. Moreover, previous literature concerning Asian individuals' attributions towards mental illness has focused on broader concepts of mental illness, asking participants to respond to a wide range of problems including developmental disabilities (e.g., mental retardation, autism) [17] and youth issues (e.g., alcohol/drug, emotional disturbance) [18], rather than on specific disorders such as ADHD, as was done in this study. More detailed examination of the perceptions and understanding of ADHD among Chinese immigrant mothers would be needed to determine if they have a different concept of ADHD compared to other mental illnesses.

Although use of audio-taped scenarios may have helped to retrieve relatively immediate attributional responding, and feedback from mothers indicated that the scenarios were applicable to real-life situations, the scenarios used in this study had a singular focus on the child's behavior without supporting contextual information about the situation. This may explain why all mothers generally saw the children as responsible for behavior regardless of culture, behavior type, or diagnosis (i.e., average responsibility ratings above 5 on a 1 to 10 scale). That is, by using hypothetical situations without contextual information in this study, it appears as though mothers tended to make more neutral attributions (i.e., ratings in the midrange of the 1 to 10 scale), with the exception of making higher ratings of child responsibility attributions for prosocial behavior exhibited by nonproblem children, which suggests a possible ceiling effect (i.e., mean ratings above 8 on a 1 to 10 scale). These issues may also be related to the variable internal consistencies of attributional ratings based on only four scenarios of each type on the DAQ. Thus, alternative scenario design (e.g., inclusion of contextual information), manners of presentation (e.g., video observation of interactions), methods of responding (e.g., in vivo during daily home activities/situations), and/or responding to the behavior of their own children that are more characteristic of ''live'' events should be explored as alternate methods of approximating mothers' actual beliefs and reactions.

Only the attributions of Chinese immigrant and Euro-Canadian mothers of boys were investigated in this study. Future research is needed to assess the attributions of fathers, parents from other cultural backgrounds, and the parental attributions for the behavior of girls as well.

Summary

The attributions made by Chinese immigrant and Euro-Canadian mothers of 5 to 9-year-old boys regarding the causes of child prosocial and problem behaviors exhibited by children with and without ADHD were investigated. This study found a positive impact of ADHD diagnosis on maternal attributions for child behavior, as well as a cultural difference in the child-serving attributional bias between Chinese immigrant and Euro-Canadian mothers. Furthermore, this study contributes to the

understanding of the interaction between culture and labeling on attributions for child behavior, in that mothers from both cultural groups were found to interpret the influence of ADHD in a similar fashion and to hold similar general beliefs about the disorder. Thus, although the Chinese culture holds higher expectations for inhibition and compliance from nonproblem children in comparison to the Euro-North American culture, Chinese mothers in this study did not view problem behaviors exhibited by children described as having with ADHD as more unacceptable or distressing. This is a first step in contributing to clinicians' understanding of the perceptions and beliefs of Chinese parents who may face their child being diagnosed with ADHD, and how their mental health service use and response to treatment interventions may be generally similar, with some unique differences, to those of Euro-Canadian families.

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