EFFECTS OF EMOTIONAL MOTIVATIONAL INTENSITY ON MATERNAL COGNITIONS

by

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Abstract

Emotions are central to the parenting experience, and mothers' emotions are linked to their perceptions of their children. The present study examined one causal pathway from mothers' emotions to their judgments of child behavior as well as neutral stimuli, using a motivational intensity (MI) model. This model states that emotions high in MI restrict, and emotions low in MI broaden, cognitive scope. Fifty-four mothers of 7 to 10 year-old children participated and were randomly assigned to one of three groups reflecting the type of category to be rated (objects, child misbehavior, child good behavior). Anger (high MI), sadness (low MI), and a neutral state were induced via film clips. After each induction, mothers rated the category belongingness of strong and weak exemplars of objects, child misbehavior, or child good behavior. A series of planned contrasts were run within each group to test differences in weak exemplar ratings between the neutral and high MI and the neutral and low MI conditions. For object exemplars, anger had a narrowing effect on cognitive categorization relative to a neutral state, which did not significantly differ from sadness. For misbehavior exemplars, anger instead had a broadening effect on cognitive categorization relative to a neutral state, which did not significantly differ from sadness. For good behavior exemplars, no significant differences were observed between the neutral and anger or the neutral and sadness conditions. This study extends previous research by testing the applicability of the MI model to a parenting context, as well being the first to experimentally examine a causal link between mothers' emotions and cognitions. Results are discussed in terms of the parenting, social, and cognitive literatures.

Preface

This thesis is an original intellectual product of the author.

The project was approved by the UBC Behavioural Research Ethics Board, certificate number H13-01506.

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To my parents

1 Introduction

Parental cognitions about children (e.g., beliefs, expectations, and attributions) have important relations with family processes, including parenting practices and parent-child interactions (Bugental & Johnston, 2000). In particular, parents' judgments of the wrongness of children's behaviors are related to harsh parenting (Milner, 2003), and parents' interpretations of child behavior as good are related to praise and positive parenting (Thompson, Raynor, Cornah, Stevenson, & Sonuga-Barke, 2002). In light of the relationship between parenting practices and child adjustment (e.g., Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000), investigation into the origins of variations in parents' judgments of their children's behavior is critical.

Parental cognitions and behaviors are multiply determined, shaped by various elements including genetic influences, parents' developmental history and psychopathology, as well as child characteristics (Belsky & Jaffee, 2006; Grusec, Hastings, & Mammone, 1994). As the forthcoming discussion will illustrate, parental emotions, cognitions, and behaviors all interrelate and operate in reciprocal ways. The mechanisms through which these constructs interact, however, are not well understood (Teti & Cole, 2011). Controlled studies examining focused aspects of the inter-relationships of these variables are required to better understand potential causal pathways among parental emotions, cognitions, and behaviors.

The purpose of the current study was to experimentally identify a causal effect of mothers' emotions on their judgments of child behaviors. To provide a background, the literature on emotions in the parenting context is examined, followed by a brief discussion of the links between parental cognitions and parenting behaviors. A general review of the relationship between emotions and cognitions outside the parenting context is also provided. A recent model

of this relationship, based on a specific property of emotions (motivational intensity; discussed later), is presented and used as a framework for this experimental investigation of the effects of mothers' emotions on their cognitions.

1.1 Emotions and parenting

Emotions are an integral part of the parenting experience. A wide range of emotions can be aroused and experienced during parent-child interactions, including anger, sadness, happiness, and love. Decades of research have shown that both positive and negative parental emotional experiences are associated with various child outcomes and play a role in regulating parenting (Dix, Gershoff, Meunier, & Miller, 2004), although the processes underlying these relationships remain unclear (Teti & Cole, 2011).

Mothers' feelings of anger toward and embarrassment by children have been related to authoritarian parenting styles (Coplan, Hastings, Lagacé-Séguin, & Moulton, 2002). Furthermore, Martin, Clements, and Crnic (2002) found that mothers' self-reported emotions moderate the relationship between family distress (maternal depressive symptoms, parenting hassles, and negative expressivity within the family) and maternal sensitivity. Higher levels of family distress negatively predict maternal sensitivity, but only for mothers experiencing negative emotions. No such relationship was found for mothers reporting more positive emotions. The effect of parental emotions extends from parenting behavior to children's well-being. Negative parental affect during parent-child interactions is related to lower levels of children's social competence (Carson & Parke, 1996), and negative parental emotions predict children's disruptive behavior problems (Duncombe, Havighurst, Holland, & Frankling, 2012). Furthermore, such negative parental emotions as rage mediate the relationship between parent-child conflict and children's internalizing and externalizing problems (Yeh, 2011). By contrast,

children of emotionally positive parents tend to be happier, more socially competent, and have fewer behavior problems (Cummings, Zahn-Waxler, & Radke-Yarrow, 1981; Denham, Mitchell-Copeland, Standberg, Auerbach, & Blair, 1997).

The importance of parental emotions is well established and undeniable. However, the majority of the aforementioned investigations are subject to methodological limitations, such as the use of self-report measures to gauge parental emotions, as well as correlational designs limiting the possibility of making direct causal inferences. This study addressed these limitations by manipulating mothers' emotions in a controlled environment, and examining the direct effects of this manipulation on mothers' judgments of children's behavior.

In his widely cited review, Dix (1991) proposed a model of parenting that greatly emphasizes the role that parental emotion plays in parenting competence and parent-child interactions. The model comprises three components: emotion activation (the child, parent, and situational factors that elicit emotions in parents); engagement (the organizing effects that emotions have on parenting); and emotion regulation (how parents understand and control their emotions). The emotion activation stage is influenced at least in part by cognitive processes. For example, how angry and upset parents become with a child who has misbehaved has been shown to depend on parents' judgments of the child's capacity to control their negative behavior (Dix & Grusec, 1985; Johnston & Freeman, 1997). In the engagement stage, the elicited emotions may affect parenting practices in a numbers of ways: by influencing communication (e.g., tone of voice) and/or altering parents' motivation (e.g., directing parenting behavior to change children's behavior), as well as by influencing cognition – activating attention and orienting it toward relevant information, and simplifying decision-making. In the third stage, parents must manage the emotions they experience, such that optimal levels of emotions are maintained to promote

appropriate parenting responses and child development (e.g., inhibiting displays of anxiety to ensure the child is not frightened; Dix, 1991). In order for emotion regulation to be effective, parents must make cognitive appraisals about the situation and regulate themselves accordingly (Joorman, Yoon, & Siemer, 2010). At each stage of Dix (1991)'s the model, the interplay between emotions and cognitions is evident.

Past research has shown that mothers' emotional experiences are indeed linked with their cognitions, such as expectations of and attributions for children's behavior. In one study, mothers of 6 to 8 year old children were asked to record their mood throughout the day while at home (Dix, Reinhold, & Zambarano, 1990). When mothers determined that their moods matched a certain target mood (angry, happy, or neutral), they were instructed to watch a videotape of a mother-child interaction and subsequently make a number of judgments about the interaction. They then responded to a short questionnaire assessing their own children's behavior problems, and finally answered questions about the cause and intensity of their mood. Compared to emotionally neutral mothers, mothers who were angry evaluated their children's problems as more serious, and expected their children to display more negative behaviors. When viewing the videotapes of unknown children, angry mothers expected negative interactions that would require more sternness on the part of the parent. Furthermore, they made more negative attributions for child non-compliance, and became even more upset at non-compliant behaviors, compared with emotionally neutral mothers. The authors propose that one way in which transient feelings of anger might negatively bias judgments about child behavior is through schema activation. Anger may increase the availability of anger-related categories in parents' memory and, for example, lead them to be hypervigilant to cues indicating negative intentionality on the part of the child (Fiske & Taylor, 1984). However, Dix et al. (1990) did not test this explanation,

and the trajectory from anger to parental cognitions remains unclear.

In sum, emotions play a key role in the context of parenting. They exhibit important associations with parenting behaviors as well as the quality of parent-child interactions and children's adjustment. A candidate mechanism that might explain the relationship between emotions and parenting behavior is the function of parental cognitions about child behaviors. Within all levels of Dix's model (1990), these cognitions are noted as involved in dynamic exchanges with emotions to organize sensitive parenting behavior. The relationships among emotions, cognitions, and parenting are circular and links between all three components are reciprocal (Teti & Cole, 2011). However, it is difficult to determine causal relationships between each of the components given the current state of the literature. In order to better understand the causal associations between emotions, cognitions, and parenting, studies examining possible specific pathways among these elements are necessary.

1.2   Cognitions and parenting

It is clear that parental emotions, cognitions, and behaviors are related, but also that these relationships are complex. The following section provides a brief review of the existing literature on the specific link between parental cognitions and parenting behavior. Although the link between mothers' cognitions and behaviors were not tested in this particular study, this section illustrates the importance of understanding variations in maternal judgments of children, as these are closely related to parenting behaviors. In particular, judgments about the wrongness of a child's behavior are important to our understanding of the cognitive origins of harsh parenting. In Milner (2003)'s social information processing model of child physical abuse, judgments of wrongness are a central moderator of parental disciplinary strategies, and are independent of judgments of intent. For example, even if a mother infers intentionality in a child's behavior, she

is unlikely to discipline the child unless the behavior is also appraised as wrong. Judgments of wrongness may be influenced by a number of factors, including individual differences in parents' risk for child abuse (Milner, 2003) and depressive symptomatology (Lahey, Conger, Atkeson, & Treiber, 1984). In line with Dix (1990), I propose that transient emotional states influence parents' judgments of wrongness (or goodness, by that same token) as well, and that mothers' thresholds for determining the wrongness of child behaviors vary depending on the emotional state being experienced at the time of judgment-making. Although many researchers have acknowledged the significance of the dynamic interplay between parental emotions and cognitions in the parent-child relationship, very few studies have directly measured these concepts experimentally (Teti & Cole, 2011). Thus, this study adds to the literature to provide information on a causal pathway from emotion to cognition.

To assess the relationship between mothers' emotions, cognitions, and behaviors, Smith and O'Leary (1995) had mothers view videotapes of interactions between a mother and toddler, and imagine themselves as the mother in the video. While viewing the interactions, participants monitored how they would be feeling in the position of the mother in the video. This was achieved by turning a rating dial apparatus that ranged from "very negative" to "neutral" to "very positive" throughout the interaction. Mothers were then asked to provide attributions for the negative affect and negative behaviors displayed by the child in the video. These attributions were coded for locus of control: child-related (The child is crying because he is impatient), parent-related (The child is crying because I/the mother was too hard on him), or situational (The child is crying because he hurt himself), as well as along other dimensions such as stability and intent. Mothers' child-related attributions uniquely predicted self-reported harsh parenting. Harsh parenting was also strongly correlated with mothers' negative emotional arousal as they viewed

the interactions. This study illustrates important associations between maternal emotions in real-time, cognitions about child behaviors, and parenting strategies. However, it is difficult to disentangle the causal relations among these links. For example, it is unclear whether mothers were showing negative emotional reactions based on their judgments of the child's behavior, or rather, whether these attributions were triggered by the negative emotions. Although such studies are good first steps, more controlled experimental methodologies can help shed light on the possible temporal and causal pathways in the interplay between parental emotions and cognitions, and ultimately parenting behaviors.

In a more recent study, mothers and their toddlers participated in a laboratory-based interaction designed to elicit challenging but manageable toddler behavior (e.g., having the child put away attractive toys during a clean-up session) (Lorber & O'Leary, 2005). Mothers watched videotaped segments of their interaction with their child, and simultaneously and continuously rated their child's behavior during the segment using the same rating dial used in the Smith and O'Leary (1995) study. Next, mothers watched the segments a second time, and continuously rated their own emotions using the same dial procedure. Objective raters also coded the children's behavior (e.g., negative affect, complying with maternal commands) and the frequency of mothers' anger and irritation during the interaction. Mothers' self-reported negative emotional experiences and negatively biased appraisals of child behavior were significantly related to each other. That is, when mothers reported experiencing negative emotions, they were more likely to rate the child's behavior as negative, even when objective raters did not. Moreover, mothers' self-reported negative emotions and negatively biased appraisals were both significantly related to overreactive discipline. Results from mediation models suggested that the relationship between maternal emotional experience and overreactive discipline was explained

by mothers' negatively biased cognitive appraisals of their children's behavior.

In sum, parents' evaluations of their children's behavior relate importantly to parenting behavior. Parents' judgments of the wrongness of their children's behaviors are arguably an essential component in their decision to adopt harsh disciplinary strategies (Milner, 2003). However, this relationship is complicated by parents' experienced emotions (Dix, 1991; Teti & Cole, 2011). This study examined one possible pathway from mothers' emotions to their judgments of children's behavior. To provide a framework for this investigation, the literature on the association between emotion and cognition outside the parenting context is reviewed next.

1.3 Emotional valence and cognition

In order to better understand how the links between affective states and judgments may operate in mothers, relevant aspects of the literature on emotion and cognition outside the family context were examined for guidance. An early link between emotional and cognitive processes emerged when Easterbrook (1959) proposed that emotional arousal has a direct influence on the range or scope of attention. Low emotional arousal should lead to a broadening of the attentional scope, allowing for more information to be absorbed. Conversely, high emotional arousal should lead to a narrowing of the attentional scope, in order for focus to be directed only to relevant cues, and peripheral cues ignored. High emotional arousal has been generally interpreted as being characterized by high physiological arousal and negative valence, such as anxious states (Larsen & Diener, 1992). In threatening situations, narrowing of attention may serve an adaptive function, as it facilitates the individual's focus on the problem at hand (Derryberry & Tucker, 1994). Several studies have illustrated the constricting effect on cognition caused by negative trait anxious moods (e.g., Mikulincer, Kedem, & Paz, 1990); however, the role of participants' emotional state was less clear. The current study examined the influence of particular parental

emotional states on judgments of child behaviors, by inducing discrete emotional states and controlling for trait mood through random assignment.

The influence of emotions on cognition has been further demonstrated by examining conceptual scope – i.e., the way individuals form mental concepts and categories, and represent relations among them (Friedman & Förster, 2010). Isen and Daubman (1984) observed the effects of positive affect on cognitive categorization. Participants received either positive, negative, or neutral emotion induction. They were then presented with the name of a category, followed by nine exemplars (three excellent, three moderate, and three weak). Participants were asked to rate, on a 10-point scale, how well they believed an item either belonged or did not belong to a category. An example of a category is "vehicle"; weak exemplars are "elevator", "camel", and "feet". Participants in the positive affect conditions were more likely than participants in the neutral condition to rate these weak or nonprototypical exemplars as members of the category "vehicle", suggesting that positive emotions lead to broader category formations. Interestingly, there was a nonsignificant trend for participants in the negative affect group to similarly rate the weak exemplars as better category members. This trend contradicts the theory that emotion valence determines cognitive scope; in this case, negative emotions produced effects comparable to positive emotions. While these results may resonate with the idea that positive moods broaden the conceptual scope, they are inconsistent with the narrowing of cognition that has generally been associated with negative mood. One explanation the authors propose for their findings related to negative affect is that individuals in bad moods may engage in a type of mood repair, whereby after the passage of some time, they begin to think about positive things, thus producing effects similar to individuals in positive moods. However, this explanation does not resolve the discrepancy between these results and the results from other

studies showing that negative affect constricts cognitive scope (e.g., Mikulincer et al., 1990). As the forthcoming discussion will convey, emotional valence alone (i.e., positive vs. negative) may not be what determines breadth of attention and cognitive categorization (Gable & Harmon-Jones, 2010b).

Isen, Niedenthal, and Cantor (1992) extended their work to examine the relationship between positive affect and social categorization. Following emotion induction, participants were presented with four superordinate trait categories one at a time (nurturant, artistic/cultured, emotionally unstable, artificial/pretentious). For each trait, participants rated seven exemplars (four good, three weak) on a 7-point scale, based on how good of an example the participant believed the exemplar was of the trait. Participants who underwent the positive emotion induction rated weak exemplars as better members of the superordinate trait category than controls, but only for positive categories (i.e., nurturant and artistic/cultured). These findings suggest that the broadening effects that positive moods have on categorization may be specific to contexts in which mood and stimuli characteristics are congruent. However, subsequent results have been mixed, with other findings indicating that positive affect promotes cognitive flexibility when making judgments about both positive (mood-congruent), as well as neutral stimuli (Murray, Sujan, Hirt, & Sujan, 1990).

In sum, for several decades, emotional valence was thought to influence individuals' attentional and conceptual scopes: positive emotions would broaden, and negative emotions would constrict, cognition (e.g., Derryberry & Reed, 1998). However, findings in this area have been problematic. For example, Isen and Daubman (1984) found that participants experiencing negative emotions tended to categorize objects similarly to participants experiencing positive emotions. Inconsistencies such as these have steered subsequent research toward examining

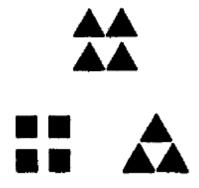alternate explanations for the influence of emotion on cognition.

1.4   Emotional motivational intensity and cognition

Recently, investigators have challenged the idea that emotional valence alone determines attentional and conceptual scope of cognition (e.g., Harmon-Jones, 2003; Harmon-Jones, Price, & Gable, 2012). They argue that past research (e.g., Fredrickson & Branigan, 2005; Isen & Daubman, 1984; Isen et al., 1992) may have confused the effects of emotion valence with motivational intensity (MI), the extent to which an emotion generates an incentive for an individual to engage in action and move either toward or away from a stimulus. These studies have typically compared positive affects low in MI with negative affects high in MI. For example, Fredrickson and Branigan (2005) reported that positive emotions broadened attentional scope and thought-action repertoires (generating a series of responses to the prompt "right now, I would like to…") relative to a neutral state. On the other hand, negative moods narrowed thought-action repertoires. However, the positive emotions induced – amusement and contentment – were both low in MI. Amusement and contentment can both be conceptualized as an arousing, positive states, but not ones that will strongly motivate an individual to approach or withdraw from stimuli in the environment (Harmon-Jones, Price, & Gable, 2012). Furthermore, the negative moods induced – anger and anxiety – were both high in MI. Individuals will be prompted to move toward and away, respectively, from stimuli that induce these emotions. This confounding of emotional valence with emotional MI may explain many of the effects on cognition attributed to valence in previous research. It is argued that MI, rather than valence, influences breadth of cognition: emotions high in MI will narrow the attention and conceptual scopes, while emotions low in MI will broaden them (Gable & Harmon-Jones, 2010c).

In a series of studies, Gable and Harmon-Jones (2008) examined the effect of positive emotions varying in MI on attentional scope. In one experiment, participants were randomly assigned to one of two positive affect induction groups. Amusement (low MI) was elicited by having participants view segments of animals in humorous situations; desire (high MI) was elicited by having participants view a film depicting appealing desserts. Breadth of attention was assessed with a standard global-local visual processing task (Kimchi & Palmer, 1982; see Figure 1.1). In this paradigm, participants are presented with three figures, each comprised of three to nine local elements (squares or triangles). The standard figure is positioned on top, and the two comparison figures are positioned below. One of the comparison figures matches the standard figure in terms of local elements, and the other comparison figure matches the standard figure in terms of the global element. Participants must choose which of the comparison figures is most similar to the standard figure. Decisions based on the global element of the figures indicate a broadened attentional scope. If attentional scope depends on emotion valence, to be consistent with previous research, both groups should have displayed a tendency to process at the global level. Instead, participants in the amusement group (low MI) were more likely to select the comparison figure that shared the same global element as the standard, whereas participants in the desire group (high MI) were more likely to choose the comparison figure that shared the same local elements as the standard. These narrowing effects of high MI positive affect were replicated in a related study (Gable & Harmon-Jones, 2008). Participants were randomly assigned to one of two groups. Desire was induced in the affect condition by having participants view photos of appetizing desserts. Moreover, half of the participants in this group were told that they would be able to subsequently consume the desserts; this manipulation was believed to further increase approach motivation. Participants in the control condition viewed neutral photos

(e.g., paper plates). Following mood induction, participants completed a global-local visual

processing task. Results again showed that participants in the expect-to-consume (high MI)

group showed the most narrowed, or local, processing, followed by the rest of the participants in

the dessert condition, while participants in the control condition displayed the broadest

attentional scope. Together, these studies provide evidence that positive emotions high in MI

constrict attention relative to positive emotions low in MI or neutral states. The authors assert

that the narrowing of attention associated with positive affect high in MI may serve an adaptive

function, as it focuses the individual on goal attainment. Similar findings were reported across

several methods of mood induction and cognitive tasks (Gable & Harmon-Jones, 2010b; Gable

& Harmon-Jones, 2011).

Figure 1.1   Example of stimuli used in global-local visual processing tasks

These effects on visual attention were replicated in an investigation of negative emotions

varying in MI (Gable & Harmon-Jones, 2010a). Participants viewed photos selected to elicit

either disgust (high MI), sadness (low MI), or a neutral state before completing a global-local

visual processing task. Results showed that participants in the disgust group responded slower to

global targets, relative to the neutral group. Furthermore, participants in the sadness group

responded quicker to global targets and showed a greater difference in reaction time between

global and local targets, relative to the neutral group. Consistent with the theory, these results

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suggest that negative affect high in MI narrows attentional scope, while negative affect low in MI serves to broaden it.

Only one study has examined cognitive categorization effects using the MI model. Participants' posture and facial expressions were manipulated to induce positive emotions varying in MI (Price & Harmon-Jones, 2010) prior to completing a cognitive categorization task modelled after Isen and Daubman (1984). Participants were presented with four superordinate categories (e.g., vehicle) one at a time, and for each category were asked to rate, on a 7-point scale, the extent to which exemplars varying in goodness-of-fit (e.g., camel, bus) belonged to the category. Results were consistent with the MI model: low MI positive affect broadened categorization (participants displayed a greater tendency to include nonprototypical exemplars as category members), while high MI positive affect narrowed categorization.

In sum, recent findings point to the emotional property of motivational intensity as a more likely determinant of cognitive scope than emotional valence. Despite this promising shift in the emotion-cognition literature, research on the interplay between emotion and cognition in the parenting context remains an area in need of further investigation. Azar, Reitz, and Goslin (2008) underline the significance of problem solving and cognitive flexibility in their social information processing model of parenting: when strong negative emotions are triggered, these cognitive capacities will be impaired and parents may act in maladaptive ways. In addition, negative emotions have been linked to a reduced interpersonal flexibility in parent-child interactions. During conflict situations, mothers and daughters expressed consistently negative emotions and were less able to emerge from these states to more positive ones (Hollenstein & Lewis, 2006). Furthermore, such rigidity has been associated with the development of internalizing and externalizing problems in young children (Hollenstein, Granic, Stoolmiller, &

Snyder, 2004). Such findings underscore parental emotions as useful targets of intervention, however, as the cognition literature has shown, a simple negative vs. positive distinction between affective states may not be most informative for capturing the full picture of the effects of parental emotions on cognitions. Research in parenting has not yet explored emotions varying in MI rather than valence. Further still, to my knowledge, not one study has systematically examined the effect of an experimental manipulation of mothers' emotions on their judgments of children's behavior.

1.5   The current study

Previous investigations of the interplay between emotion and cognition in the parenting context have been limited by their methods. A review of the relevant literature has revealed links between parental emotions and cognitions, however these factors have commonly been assessed via self-report (e.g., Dix, Reinhold, & Zambarano, 1990). Studies that have attempted to capture more valid measures of mothers' experienced emotion using the dial method typically only contain a measure of emotional valence (positive-neutral-negative; e.g., Lorber & O'Leary, 2005). As the review of the cognition literature has shown, emotional valence may not be the only factor influencing cognitive processes (e.g., Harmon-Jones, Price, & Gable, 2012). Therefore, these two literatures must be reconciled for a better understanding of the role of emotions in parenting.

It is clear that the interplay between emotions and cognitions in parenting is complex. A goal of the current study was to identify one potential causal pathway from mothers' emotional states to their judgments of child behavior. This relationship was examined experimentally using the MI model. Mothers of young children were randomly assigned to one of three groups reflecting the type of category being judged (objects, child misbehavior, child good behavior).

Within each group, each mother received a high MI emotion induction (anger), a low MI emotion induction (sadness), and a neutral emotion induction via the presentation of film segments drawn from previous research (Bartolini, 2011; Gross & Levenson, 1995; Schaefer, Nils, Sanchez, & Philippot, 2010). Following mood induction, mothers rated the extent to which a series of strong and weak exemplars of the category fell within the category (either objects – tool, vehicle, clothing, – child misbehavior, or child good behavior). Based on previous research using the MI model, the following predictions were made:

1a) Mothers experiencing a high-MI emotion (anger) will rate weak exemplars of objects lower than mothers experiencing a neutral emotion state.

1b) Mothers experiencing a low-MI emotion (sadness) will rate weak exemplars of objects higher than mothers experiencing a neutral emotion state.

2a) Mothers experiencing a high-MI emotion (anger) will rate weak exemplars of child misbehavior lower than mothers experiencing a neutral emotion state.

2b) Mothers experiencing a low-MI emotion (sadness) will rate weak exemplars of child misbehavior higher than mothers experiencing a neutral emotion state.

3a) Mothers experiencing a high-MI emotion (anger) will rate weak exemplars of child good behavior lower than mothers experiencing a neutral emotion state.

3b) Mothers experiencing a low-MI emotion (sadness) will rate weak exemplars of child good behavior higher than mothers experiencing a neutral emotion state.

It may seem counterintuitive to expect that emotions that are similar in valence (e.g., anger and sadness) would have dissimilar effects on maternal cognitions about child behavior. Furthermore, the expected effect of anger contradicts previous findings in the parenting literature, where anger was shown to increase the likelihood of mothers' viewing child behavior

negatively (Dix et al., 1990). However, the predictions for the study were consistent with the MI

model, and consistent with the goal of the study to test the applicability of this model to the

context of parenting.

2 Method

2.1 Research design

The research question was addressed using an experimental design, assessing both between (type of stimulus rated – objects, child misbehavior, child good behavior) and within (MI of induced emotion – high, neutral, low) factors. The primary independent variable was the MI of the induced emotional state (high = anger; low = sadness) and the main dependent variable was mothers' categorization of child behaviors and neutral stimuli, represented by ratings of the category belongingness of the weak exemplars in each of the categories.

2.2 Participants

Fifty-five mothers of 7 to 10 year-old children (51.9% male) participated. One participant was dropped at random to create equal groups for statistical analyses (see Results section); descriptive statistics reflect the reduced sample of 54. Mothers were recruited over the course of 6 months through advertisements posted at community centres, libraries, and other public areas within the Lower Mainland (See Appendix A for flyer). Furthermore, participants were also recruited from the UBC Parenting Lab's periodical newsletter and volunteer registry. The volunteer registry is a database of families who have participated in previous studies in the Parenting Lab, and who have agreed to be contacted regarding future studies. Demographic characteristics of the sample are presented in Table 2.1. Confirming the community nature of the sample, mean maternal hostility and depression scores were comparable to mean scores observed in non-clinic populations (.28 and .35, respectively; Derogatis & Melisaratos, 1983). The mean score for child total problems also fell within the normal range (61st – 67th percentile), compared to a sample of American children ages 8-10 (Youth In Mind, 2004). The maternal education and

Table 2.1   Participant characteristics

	Mean	SD	Frequency (%)
Mother age (years)	42.15	4.88	
Child age (years)	9.00	1.25	
Child gender			male 51.9
Mother ethnicity			European-Caucasian 48.1
			Asian 24.1
			Other 27.8
Mother-child relationship			biological 100
Marital status			married or common law 79.6
			divorced or separated 9.3
			single 11.1
Mother education			high school graduate 1.9
			partial college/university 22.2
			standard college/university graduate 44.4
			graduate or professional training 31.5
Mother employed			yes 68.5
Household income			< $5000 5.6
			$5000 - $19 999 9.3
			$20 000 - $34 000 3.7
			$35 000 - $49 000 16.7
			$50 000 - $74 000 14.8
			$75 000 - $99 000 13.0
			$100 000 - $149 999 25.9
			$\geq$ $200 000 5.6
Mother hostility[a]	.62	.52	
Mother depression[a] (BSI)	.48	.52	
Child total problems[b] (SDQ)	7.56	4.55	

Note. BSI = Brief Symptom Inventory; SDQ = Strengths and Difficulties Questionnaire.
[a]Possible range between 0 – 4. [b]Possible range between 0 – 40.

household income statistics indicate that the sample was fairly high functioning and socially advantaged.

Because the nature of the experiment required that mothers read and comprehend exemplars of child behavior and neutral categories, those who were not fluent in English were excluded from participating. According to mother report, one child was diagnosed with a learning disability, and another with comorbid speech delay and reading disorder. Mothers of these children were not excluded because the sample was meant to represent the general community, in which such disorders are expected to occur.

2.3 Materials

2.3.1 Emotion induction stimuli

Emotions were induced in participants via the viewing of clips from feature films. The clip eliciting anger was drawn from the film *Crash*, and validated in previous research by Bartolini (2011). This clip has been shown to elicit higher levels of anger than 15 other emotional states (e.g., anxiety, fear, amusement). However, in previous research, the clip did not elicit discrete anger independent of contempt and disgust (Bartolini, 2011). Difficulty eliciting discrete anger is a common problem in emotion research (Rottenberg, Ray, & Gross, 2007). Given the lack of availability of another well-validated clip to elicit discrete anger, coupled with the conceptualization of contempt and disgust as both high in MI, the clip from *Crash* was chosen as the most suitable for inclusion in this study. The clip eliciting sadness was drawn from the film *The Champ*, and validated in previous research by Gross and Levenson (1995). This clip was shown to elicit sadness significantly more than each of 15 other emotional states assessed by a self-report emotion inventory (Gross & Levenson, 1995). A third clip eliciting a neutral state was drawn from the film *The Lover* and was accessible via the FilmStim database (Schaefer et al.,

2010). FilmStim is an openly available web-based database of film clips eliciting each of seven emotional states. The neutral clip selected for this study had the lowest arousal, positive affect, and negative affect scores compared to every other clip in the database eliciting any of six other emotional states (Schaefer et al., 2010). The film clips selected to elicit anger, sadness, and a neutral state in this study were 4 minutes, 30 seconds, 2 minutes, 46 seconds, and 42 seconds in length, respectively. Success of the emotion inductions for the current study is reported in the Results section.

2.3.2 Dependent measure

2.3.2.1 Object exemplars

A set of seven (four strong, three weak) exemplars of each of the categories "vehicle", "carpenter's tool", and "clothing" were drawn from the widely used stimuli developed and normed by Rosch (1975; See Appendix B). Similar stimuli including both strong and weak exemplars were used in previous research on the effects of emotion on cognitive categorization (e.g., Isen & Daubman, 1984). One group of mothers rated the extent to which each vehicle exemplar exemplified their general idea of "vehicle" using a 7-point Likert scale (1 = *not at all a good example*, 7 = *a very good example*). This was repeated for the "carpenter's tool" and "clothing" categories.

2.3.2.2. Child behavior exemplars

An extensive list of child behaviors was created for use in the current study. The author generated two separate lists, one for the category of child misbehavior, and another for the category of child good behavior. Each list contained both strong and weak exemplars of the category. Sample strong exemplars for misbehavior and good behavior are "A child insulted his/her parents" and "A child gave up his/her seat on the bus to a boy on crutches". Weak

exemplars are "A child did not want to try a new food at dinner" and "A child saved his/her allowance money".

The child behavior stimuli were piloted along three dimensions. Seventeen adults (mean age = 26.0 years; 64.7% female) participated in the piloting procedures. Individuals (some of whom were mothers) first provided basic demographic information including age, ethnicity, and degree of experience with children. Each individual read every exemplar of child behavior and was asked to rate, using 7-point Likert scales: (1) the extent to which the behavior in question was characteristic of a boy or a girl (1 = *boy*, 4 = *neutral*, 7 = *girl)*; (2) their impression of the age of the child performing the behavior in question (1 = *0-2 years*, 4 = *7-9 years*, 7 = *15-17 years*); and (3) the extent to which the behavior in question was a good example of the target category (either misbehavior or good behavior; 1 = *not at all a good example*, 7 = *a very good example*). Items that were not gender-neutral, that applied to children well outside the 7-10 year-old age range, or that were strongly influenced by respondent ethnicity or experience with children were excluded from the final lists. Based on inter-rater agreement, twelve reliable strong exemplars and nine reliable weak exemplars were chosen to make up each of the final lists for use in the proposed study (See Appendices C and D). Mean ratings of category belongingness for strong exemplars of child misbehavior and child good behavior were 6.19 and 6.06 respectively. Mean ratings of category belongingness for weak exemplars of child misbehavior and child good behavior were 4.10 and 3.94 respectively. Overall, the piloting participants indicated that they perceived the selected items to be gender neutral (averages of 3.53, 3.79, 4.25, and 4.09 on a scale of 1 to 7 for strong and weak exemplars of misbehavior and strong and weak exemplars of good behavior, respectively). Furthermore, they indicated that they perceived the selected items as representing behavior typical of a 10-year-old child (averages of 5.00, 4.47, 5.36, and 4.99 on

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a scale of 1 to 7 for strong and weak exemplars of misbehavior and strong and weak exemplars of good behavior, respectively).

In the current study, one group of mothers rated the degree to which each child misbehavior exemplar exemplified their general idea of child misbehavior. Mothers in another group rated the extent to which each child good behavior exemplar exemplified their general idea of child good behavior. Ratings were made on a 7-point Likert scale (1 = *not at all a good example*, 7 = *a very good example*).

2.3.3 Descriptive measures

2.3.3.1 Participant demographics

Mothers completed the Child and Family Information questionnaire (CFI), developed at the Parenting Lab (See Appendix E). The CFI was used to gather basic demographic information about participants, including family members' age, gender, ethnicity, nationality, and education, as well as sibling information, behavioral and learning problems, and mothers' employment and marital status. This information was used to describe the sample.

2.3.3.2 Maternal psychological functioning

Mothers' psychological functioning was assessed using the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983). The BSI is a 53-item self-report measure of psychiatric symptom status for use in both normal and psychiatric populations (See Appendix F). Nine symptom dimensions are measured: Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. Items are rated on a 4-point Likert scale (0 = *not at all*, 4 = *extremely*). The BSI also provides three global indices of distress associated with symptomatology. The scale has demonstrated good internal consistency (*a*'s ranging from .71 to .85) and good test-retest

reliability (*r*'s ranging from .78 to .91, with the exception of Somatization, *r* = .68). Test-retest

reliability for the distress indices is also strong (*r*'s ranging from .80 to .90). BSI scores have

shown good construct validity and strong convergent validity with other measures of

psychological functioning. In the current study, mothers' BSI scores were used to describe the

sample as well as to screen for potential covariates in the analyses. Cronbach's alphas for the

Depression and Hostility scales in the current sample were .82 and .67, respectively.

2.3.3.3   Child adjustment

Mothers completed the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) to

assess their children's behavior along five dimensions: emotional symptoms, conduct problems,

hyperactivity/inattention, peer relationship problems, and prosocial behavior (See Appendix G).

Mothers indicate how true each of a series of behaviors is for their child (*Not true, Somewhat*

true, Certainly true). The SDQ has been validated for use with 3 to 16 year-old children. The

five-factor structure has been confirmed in subsequent studies, and the scale has shown good

internal consistency (*a* = .73) and satisfactory test-retest reliability (*r* = .62) (Goodman, 2001).

The SDQ has also been found to predict future psychopathology in children at 3-year follow-up

(Goodman & Goodman, 2009). SDQ subscale scores were used to describe the sample as well as

to screen for potential covariates in the analyses. Cronbach's alpha for the Total Problems

subscale in the current sample was .77.

2.4   Procedure

Recruitment advertisements directed mothers to call the Parenting Lab if they were interested in

participating in the study. Upon calling the lab, mothers were informed that we were conducting

a study on the relationship between emotions and the way that parents make judgments about

other people and objects in the environment. The procedure of the experiment was described,

however, mothers were not informed of the specific hypotheses of the study. If they agreed to participate, a trained research assistant (RA) determined whether the mother met inclusion criteria for the study. The RA inquired about the child's age and gender, and about how long the mother had lived with the child, and how at ease she felt reading and communicating in English. If they met inclusion criteria for the study, mothers were invited to participate and an appointment was scheduled for them to come to the Parenting Lab.

Participants were assessed individually. Upon arrival at the Parenting Lab, an RA went over the procedures of the study with the mothers. Mothers were informed that there were no foreseeable long-term physical or psychological consequences of participating in the study, but that some of the scenes viewed might evoke short-term feelings of discomfort. Mothers were informed that they could choose not to participate in the study, and were free to withdraw from the study at any time, without any consequences. They were given the opportunity to ask any questions regarding the study and have these questions addressed. Once informed consent was obtained from the participants, we proceeded with the study.

Participants were randomly assigned, using a table of random numbers, to one of three groups reflecting the type of category being judged. Group 1 rated object exemplars, Group 2 rated child misbehavior exemplars, and Group 3 rated child good behavior exemplars. All participants were seated in front of a computer equipped with Inquisit 4.0 (Millisecond software, Seattle, WA). The RA then provided mothers with the specific instructions for the categorization task. Once participants expressed that they understood the instructions, the RA initiated the computer task and exited the room.

Mothers first viewed a short film clip eliciting either anger or sadness, in counterbalanced order. They were initially instructed to "please watch the film carefully". Simple instructions

such as these are believed to minimize demand characteristics (Rottenberg et al., 2007). Following the clip, mothers underwent a brief manipulation check by completing a modified version of the Differential Emotions Scale (DES; McHugo et al., 1982; See Appendix H). The DES is a set of 16 items representing emotion states, each comprised of a set of one to three emotional adjectives. Participants rated, on a 7-point Likert scale, the extent to which they felt each of the 16 states as they watched the film clip (1 = *not at all*, 7 = *very intense*).

Following the manipulation check, mothers completed the first categorization task. For participants in Group 1, a series of seven (4 strong, 3 weak) exemplars of either the category vehicle, carpenter's tool, or clothing (presented in counterbalanced order) appeared one at a time on the computer screen. After the procedures from Isen et al. (1992), the first exemplar was always a strong exemplar, and subsequent exemplars appeared in random order, as soon as the mother responded to the presented exemplar. Mothers rated the extent to which each exemplar exemplified their general idea of the target category using computer keys numbered 1 through 7. Number 1 was labelled *Not at all a good example* and number 7 was labelled *A very good example*. The rest of the keyboard was covered to minimize confusion.

Following the first trial of goodness-of-exemplar ratings, mothers viewed a second film clip eliciting a neutral state. Following the clip, mothers completed the DES a second time, and then performed a similar categorization task in which they judged the extent to which each exemplar exemplified their general idea of the category vehicle, carpenter's tool, or clothing. Following the second trial, mothers completed the procedure a third time. They viewed a film clip eliciting either anger or sadness (depending on which emotion was already elicited in the first trial), completed the DES, and then rated exemplars of the category vehicle, carpenter's tool, or clothing.

The procedure was essentially identical for Groups 2 and 3. However, the RA provided slightly modified instructions. The RA explained that child behaviors can be classified on a continuum, and that some behaviors are better examples of misbehavior or good behavior than others. Participants were asked to think about children in general and not their child specifically. Mothers in Group 2 completed three trials of goodness-of-exemplar ratings for behaviors in the child misbehavior category. Mothers in Group 3 completed three trials of goodness-of-exemplar ratings for behaviors in the child good behavior category.

Following the emotion induction and categorization tasks, mothers engaged in 1 to 2 minutes of casual conversation with the RA. Following this brief discussion, mothers were instructed to fill out the CFI, followed by the BSI and SDQ in counterbalanced order. In line with the recommendations by Rottenberg et al. (2007), participants were also asked whether or not they had previously seen the film they viewed during the study. When the participants finished completing the questionnaires, the RA answered any questions they had regarding the study. They were then thanked and compensated with a $15 honorarium. Testing sessions at the Parenting Lab lasted approximately 45 to 60 minutes.

3 Results

3.1 Data plan

Within each group of participants (mothers who rated objects, child misbehavior, or child good behavior), Pearson correlations were conducted to examine the relationships between the study's main dependent variable (the average ratings of the weak exemplars of the object or child behavior categories) and potential covariates (i.e., demographic variables, maternal psychological symptoms, and child behavioral problems). In addition, one-way analyses of variance (ANOVA) or Chi-square analyses were conducted comparing across the three groups of participants on these variables. Any covariates that were significantly related to the study's main variables ($p < .05$) were controlled in subsequent analyses.

Data were initially screened and no outliers were detected for the variable of mean ratings of weak exemplars. As already noted, one participant was dropped at random from the group of mothers rating child misbehavior to generate a balanced study design and facilitate any potential post-hoc analyses. There were no missing data for exemplar ratings, maternal age, maternal ethnicity, socioeconomic status (SES), child age, child gender, BSI scores, or SDQ scores. One data point was missing for maternal acculturation level ($n = 1$). This missing value was replaced with the mean for that variable and the latter was used in the analyses.

The emotion induction manipulation was verified with a series of paired samples t-tests (Bonferroni-corrected) on the DES ratings. To test the primary study hypotheses, planned contrasts were conducted on the ratings of the weak category exemplars. Specifically, for each group (object, child misbehavior, and child good behavior exemplars), two contrasts were run; one for anger v. neutral and one for sadness v. neutral, for a total of six contrasts. In addition, to explore main effects and a potential interaction between category rated and emotional MI, a 3

(category rated: objects, child misbehavior, child good behavior) x 3 (MI: high – anger, neutral, low – sadness) between-within ANOVA was conducted on the ratings of the weak category exemplars. Assumptions of the ANOVA were verified, and post-hoc analyses were conducted and interactions probed when appropriate.

3.2 Potential covariates

Mother age, ethnicity, SES, depressive and hostile symptomatology (assessed via BSI subscale scores), as well as child age, gender, and total behavioral problems (assessed via SDQ total problem scores) were considered as potential covariates in the main analyses. Groups did not differ significantly on maternal age, $F(2, 51) = 2.37$, $p = .10$; SES, $F(2, 51) = .06$, $p = .94$; depressive symptoms, $F(2, 51) = .07$, $p = .93$; hostility symptoms, $F(2, 51) = .79$, $p = .46$; ethnicity, $\chi^2(4) = 6.88$, $p = .14$; or child age, $F(2, 51) = 2.04$, $p = .14$; gender $\chi^2(2) = 1.04$, $p = .60$; or behavior problems, $F(2, 51) = .01$, $p = .99$.

Maternal age and SES were not significantly related to mothers' ratings of weak exemplars of objects, child misbehavior, or child good behavior after the anger, sadness, and neutral inductions (ps ranging from .15 to .99). Maternal acculturation level (assessed on a 1-10 scale) was not significantly related to object or child misbehavior exemplar ratings after the anger, sadness, and neutral inductions (ps ranging from .20 to .87). For the group of mothers rating child good behavior exemplars, maternal acculturation level was not significantly related to ratings after the anger induction ($p = .17$), but was negatively correlated to ratings after the neutral, $r(17) = -.54$, $p = .021$, and sadness, $r(17) = -.63$, $p = .005$, inductions. Furthermore, child age was not significantly related to object or child good behavior exemplar ratings after the anger, sadness, and neutral inductions (ps ranging from .10 to .65). For the group of mothers rating child misbehavior exemplars, child age was not significantly related to ratings after the

anger and neutral inductions (ps = .45 and .93), but was positively correlated with ratings after

the sadness induction, $r(17)$ = .60, p = .007. It is not possible to control for differences across

within-subject conditions in a between-within ANOVA. Of the 36 statistical analyses reported

here, only three emerged as significant (i.e., roughly 8%). This is comparable to the generally

accepted 5% Type I error rate; therefore, within-group discrepancies are not considered further.

3.3 Manipulation check

As described in the Method section, after viewing each mood induction film clip, mothers

completed a short checklist indicating, on a scale from 1 to 7, the extent to which a variety of

emotions were elicited as they watched the film clip. Means and standard deviations of mothers'

ratings of anger, sadness, anxiety, disgust, fear, warm-heartedness, and joy for each clip are

presented in Table 3.1. A series of paired samples t-tests were run to compare the various

emotions elicited by the three film clips. For each clip, the target emotion (anger, calmness, or

sadness) was evaluated against a series of other emotions, described below. A Bonferroni

correction was applied to control the inflated Type I error due to multiple analyses; obtained p-

values were compared to an adjusted alpha level of .008. After viewing the clip from *Crash*

(anger induction), mothers reported a mean anger level of 4.70 (SD = 1.99) on a 1 – 7 scale, and

felt significantly more angry than sad, $t(52)$ = 5.72, p < .001, d = .89; warm-hearted, $t(51)$ =

10.80, p < .001, d = 2.22; and joyful, $t(53)$ = 9.50, p < .001, d = 2.02. However, anger levels after

watching *Crash* did not differ significantly from levels of anxiety, $t(53)$ = -1.27, p = .21, d = .19;

disgust, $t(53)$ = .78, p = .44, d = .08; or fear, $t(53)$ = 1.75, p = .086, d = .23. This is not

inconsistent with what has been found in previous research (i.e., that discrete anger is difficult to

elicit; Bartolini, 2011). Furthermore, the similarity between anger, disgust, fear, and anxiety is

not particularly concerning from an MI framework, as all of these emotions are conceptualized

as high in MI. Therefore, the complications in eliciting discrete anger in this study do not preclude conclusions with regards to emotions high in MI, such as anger.

Table 3.1   Means and standard deviations of emotion ratings for each film clip

	Crash (anger) *M (SD)*	*The Champ* (sadness) *M (SD)*	*The Lover* (neutral) *M (SD)*
Anger	4.70 (1.99)	2.43 (1.80)	1.41 (1.27)
Sadness	3.02 (1.79)	5.80 (1.41)	1.63 (1.29)
Anxiety	5.04 (1.55)	4.39 (1.88)	1.91 (1.59)
Disgust	4.54 (1.99)	2.37 (1.76)	1.50 (1.37)
Fear	4.28 (1.76)	3.52 (2.03)	1.65 (1.38)
Warm-heartedness	1.31 (.85)	1.74 (1.56)	1.44 (.88)
Joy	1.43 (1.16)	1.06 (.30)	1.44 (.82)
Calmness	1.54 (1.02)	1.76 (1.08)	3.46 (2.08)

After viewing the clip from *The Champ* (sadness induction), mothers reported a mean sadness level of 5.80 ($SD = 1.40$) on a $1 - 7$ scale. After viewing this clip, mothers felt significantly more sad than angry, $t(53) = 11.26$, $p < .001$, $d = 2.09$; warm-hearted, $t(52) = 14.37$; $p < .001$, $d = 2.74$; joyful, $t(53) = 23.11$, $p < .001$, $d = 4.66$; anxious, $t(53) = 5.51$, $p < .001$, $d = .85$; disgusted, $t(53) = 11.43$, $p < .001$, $d = 2.15$; or fearful, $t(53) = 8.56$, $p < .001$, $d = 1.31$. Furthermore, after viewing the clip from *The Lover* (neutral emotion induction), mothers reported a mean calmness level of 3.46 ($SD = 2.07$) on a $1 - 7$ scale. After viewing this clip, mothers felt significantly more calm than angry, $t(53) = 5.92$, $p < .001$, $d = 1.19$; warm-hearted, $t(53) = 7.69$, $p < .001$, $d = 1.26$; joyful, $t(53) = 7.86$, $p < .001$, $d = 1.28$; anxious, $t(53) = 3.94$, $p < .001$, $d = .84$; disgusted, $t(53) = 5.46$, $p < .001$, $d = 1.11$; fearful, $t(53) = 4.83$, $p < .001$, $d = 1.03$;

or sad, $t(53) = 5.16$, $p < .001$, $d = 1.03$. These analyses indicate that the clips from *The Champ* and *The Lover* reliably elicited sad and neutral states, respectively.

Finally, the potential effect of participants' prior viewing of the films from which the clips were drawn was examined. Data on prior viewing were missing from one participant. Of the remaining 53 participants, 18 reported having seen *Crash* (anger), 11 reported having seen *The Champ* (sadness), and 14 reported having seen *The Lover* (neutral). Independent samples *t*-tests were conducted to evaluate whether differences existed in the emotions elicited by the clips between participants who had previously seen the films and those who had not. Compared against a liberal alpha level of .05, mean ratings of anger, sadness, anxiety, fear, warm-heartedness, and joy after *Crash*, *The Champ*, and *The Lover* did not differ significantly depending on prior viewing (*p*s ranging from .21 to .96). Mean ratings of disgust did not differ between participants who had and hadn't seen *Crash* and *The Lover* (*p*s = .65 and .49). However, participants who had not previously seen *The Champ* reported higher levels of disgust after viewing the clip from *The Champ* used in this study, $t(39.62) = 2.51$, $p = .016$, compared to those who had previously seen the film. The inclusion of prior viewing of *The Champ* as a covariate did not change the pattern of results, thus the original between-within ANOVA is reported below.

3.4 ANOVA assumptions

The assumptions of ANOVA were assessed in this data set as they also apply to alternative procedures such as the planned contrasts that were used as primary analyses. Box's test was not significant, $F(12, 12\ 604.85) = 1.58$, $p = .090$, indicating that the assumption of the equality of covariance matrices was upheld. Furthermore, Mauchly's test also was not significant, $\chi^2(2) = 4.19$, $p = .12$, indicating that the assumption of sphericity was upheld. Levene's test for the

equality of variances was run across the three groups for each level of the within-subjects factor (MI). The test was not significant for the anger, $F(2, 51) = .88$, $p = .42$; neutral, $F(2, 51) = 1.82$, $p = .17$; or sadness, $F(2, 51) = 2.85$, $p = .067$, inductions, indicating the assumption was upheld.

3.5 Main study hypotheses

The current study's hypotheses are restated the sections below and were based on previous research suggesting that emotions high in MI (e.g., anger) will restrict cognitive categories relative to a neutral emotion state, and emotions low in MI (e.g., sadness) will broaden them (e.g., Gable & Harmon-Jones, 2010a). Six planned Dunn-Bonferroni contrasts were used to test each hypothesis regarding the effect of emotional MI on category breadth. *P*-values were compared to a corrected alpha level of .008. Means and standard deviations of the mothers' ratings of weak exemplars for each type of child behavior category after the induction of anger, sadness, and a neutral state are presented in Table 3.2.

Table 3.2   Mean ratings of weak exemplars

	Emotion		
	Anger (high MI) *M* (*SD*)	Neutral *M* (*SD*)	Sadness (low MI) *M* (*SD*)
Category rated			
Child misbehavior	3.24 (1.17)	2.65 (.99)	2.78 (1.02)
Child good behavior	5.00 (1.50)	4.96 (1.53)	4.78 (1.63)
Neutral categories	3.54 (1.19)	4.19 (1.17)	4.11 (1.22)

3.5.1   Object exemplars (Hypotheses 1a and 1b)

To replicate previous research, I predicted that in the anger condition, mothers' ratings of weak exemplars of objects would be lower than their ratings in the neutral emotion condition. This

hypothesis was supported, $F(1, 102) = 14.01$, $p < .001$, $d = .55$. Furthermore, I predicted that in the sadness condition, mothers' ratings of weak exemplars would be higher than their ratings in the neutral emotion condition. This hypothesis was not supported and no significant difference was observed between these conditions, $F(1, 102) = .18$, $p = .69$, $d = .06$. Thus, when angry, mothers formed narrower categories for neutral stimuli, but they failed to form broader categories when sad, compared to a neutral emotion state.

3.5.2 Child misbehavior exemplars (Hypotheses 2a and 2b)

Consistent with the above predictions, I predicted that in the anger condition, mothers' ratings of weak exemplars of child misbehavior would be lower than their ratings in the neutral emotion condition. This hypothesis was not supported; rather, a significant difference in the opposite direction was observed between conditions, such that mothers feeling angry rated weak exemplars of child misbehavior higher (more typical of the category) than when they felt neutral, $F(1, 102) = 11.70$, $p < .001$, $d = .55$. Furthermore, I predicted that in the sadness condition, mothers' ratings of weak exemplars would be higher than their ratings in the neutral emotion condition. This hypothesis was not supported and no significant difference was observed between ratings in these conditions, $F(1, 102) = .56$, $p = .46$, $d = .13$. Thus, when angry, mothers rated ambiguous examples of child misbehavior higher and seemed to form broader categories than when in a neutral state. On the other hand, mothers made similar ratings for weak exemplars of child misbehavior when they felt sad and neutral.

3.5.3 Child good behavior exemplars (Hypotheses 3a and 3b)

 Again, I predicted that in the anger condition, mothers' ratings of weak exemplars of child good behavior would be lower than their ratings in the neutral emotion condition. Furthermore, I predicted that in the sadness condition, mothers' ratings of weak exemplars would be higher than

their ratings in the neutral emotion condition. Neither of these hypotheses were supported, and no differences in child good behavior ratings were observed between mothers feeling angry compared to neutral, $F(1, 102) = .05$, $p = .83$, $d = .02$, or between mothers feeling sad compared to neutral, $F(1, 102) = 1.13$, $p = .29$, $d = .12$.

3.6   Exploratory analyses

To evaluate potential main effects of the type of stimulus rated and emotional MI, as well as a potential interaction between these two variables, a between-within ANOVA with fixed factors of category rated (objects, child misbehavior, child good behavior) and emotional motivational intensity (anger – high MI, neutral, sadness – low MI) was conducted on the weak exemplar ratings. The main effect of MI was not significant, $F(2, 10\ 2) = .04$, $p = .97$, partial $\eta^2 = .00$. There was a significant main effect of category rated, $F(1, 51) = 16.54$, $p < .001$, partial $\eta^2 = .39$. However, this main effect was qualified by a significant interaction between MI and category rated, $F(4, 102) = 2.62$, $p = .04$, partial $\eta^2 = .09$ (see Figure 3.1).

3.6.1   Type of category by emotional MI

The two-way interaction between type of category rated and emotional MI was decomposed to examine the simple effect of type of category (objects, child misbehavior, child good behavior) at each level of emotion (anger, neutral, sadness). Significant differences in weak exemplar ratings among the three categories were observed in all conditions: anger, $F(2, 153) = 9.65$, $p < .001$; neutral, $F(2, 153) = 15.08$, $p < .001$; and sadness, $F(2, 153) = 11.28$, $p < .001$. These effects were followed-up with Tukey's method for pairwise comparisons. Within the anger condition, mean ratings for child good behavior exemplars were significantly higher than child misbehavior exemplars, $p < .001$, $d = 1.31$, and ratings for object exemplars, $p = .004$, $d = 1.08$. Mean ratings for misbehavior exemplars did not differ from object exemplars, $p = .77$, $d = .25$, in the anger

condition. Within the neutral emotion condition, mean ratings for child good behavior exemplars were significantly higher than child misbehavior exemplars, $p < .001$, $d = 1.79$, but did not significantly differ from object exemplars, $p = .16$, $d = .57$. Mean ratings for object exemplars were significantly higher than misbehavior exemplars, $p = .004$, $d = 1.42$, in the neutral emotion condition. Within the sadness condition, mean ratings for child good behavior exemplars were significantly higher than child misbehavior exemplars, $p < .001$, $d = 1.47$, but were not significantly different from object exemplars, $p = .29$, $d = .47$. Mean ratings for object exemplars were significantly higher than misbehavior exemplars, $p = .010$, $d = 1.18$, in the sadness condition. Overall, in the anger condition, category breadth was largest for child good behaviors, and was similar for objects and child misbehaviors. In the neutral and sadness conditions, category breadth for child good behaviors was similar to the category breadth for objects, and both were larger than for child misbehaviors.

3.6.2   Type of category rated

Although main effects must be interpreted within the context of the significant interaction, the results of the planned contrasts and visual inspection of the graph (Figure 3.1) suggest that the interaction is driven by a difference between ratings of exemplars from the object categories and the child misbehavior category in terms of the effect of high versus neutral emotional MI on category breadth. It is worth noting that, overall, via Tukey's method, ratings for weak exemplars of child good behavior were significantly higher than ratings for weak exemplars of child misbehavior, $p < .001$, and neutral categories, $p = .022$. That is, mothers overall more readily rated weak exemplars of child positive behaviors as belonging to the category and were more stringent in their willingness to see weak exemplars of misbehaviors as belonging to that category.

Figure 3.1 Estimated marginal means of weak exemplars of objects, child misbehavior, and child good behavior, across anger (high MI), neutral, and sadness (low MI) conditions

Error bars represent standard error.

4 Discussion

This study tested a causal pathway from maternal emotions to cognitions within a motivational intensity framework. Although previous research in the parenting literature has clearly identified maternal emotions as being crucial to understanding parenting (e.g., Dix, 1991; Teti & Cole, 2011), these studies have been correlational, precluding specific conclusions about the directionality of effects. The current study extends previous research by being the first to experimentally induce emotions in mothers, and observe the cognitive consequences of this manipulation. Specifically, mothers experienced anger, sadness, and a neutral state, and subsequently rated the category belongingness of object exemplars to replicate previous research on emotional MI. Mothers also rated child misbehavior and good behavior exemplars to test the MI model in a parenting context.

4.1 Object exemplars

4.1.1 Anger

As predicted, in this study, mothers feeling angry (high MI) rated the category belongingness of weak exemplars of various objects lower than mothers feeling neutral. In other words, they were more selective with what they chose to include in their mental representation of the categories "vehicle", "carpenter's tool", and "clothing" when angry compared to neutral. This is in line with previous research showing that the experience of emotions high in MI tends to narrow the cognitive scope. For example, Gable and Harmon-Jones in 2010 showed that the experience of disgust (high MI) caused participants to focus their attention on the local elements of figures more so than the experience of a neutral emotion. Given the result of the current study, the effect of high-MI negative affect can now be extended from attentional narrowing to conceptual narrowing of cognition. The narrower categories formed by mothers experiencing a high-MI

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emotional state is consistent with the theory that such a state leads to an elimination of peripheral information (in this case, weak category exemplars) to facilitate the motivation or urge to engage in action that is created by the emotion. Furthermore, the replication of previous research showing that high emotional MI causes a narrowing of the cognitive scope for neutral stimuli supports the validity of the methods used in this study.

4.1.2 Sadness

On the other hand, mothers feeling sad (low MI) did not rate the category belongingness of weak object exemplars differently than mothers feeling neutral. This contradicts previous research on MI, which has shown that the experience of sadness caused participants to focus on the global elements of a figure in a perceptual task more so than the experience of a neutral emotion (Gable & Harmon-Jones, 2010a). One possible reason for this discrepancy is that negative emotions low in MI do not in fact broaden cognitive scope. Indeed, earlier evidence exists to question this aspect of MI theory. Contrary to the results of Gable and Harmon-Jones (2010a), Gasper and Clore (2002) found that, in a perceptual task, participants feeling sad were more likely to focus their attention on the local (rather than the global, as MI theory would predict) components of figures, compared to participants feeling neutral or happy. However, a closer look reveals important methodological differences between these two studies: Gasper and Clore (2002) asked participants to recall a past event that made them feel "sad and negative", whereas the Gable and Harmon-Jones (2010a) presented stimuli selected specifically to induce a sad emotion state. Therefore, as with many earlier studies examining the effects of emotion on cognition, Gasper and Clore (2002) may have confounded emotion valence with emotional MI.

Given the ambiguities that arise with this first interpretation suggesting that low emotional MI does not broaden cognitive scope, two other plausible explanations for the current

study's failure to find a difference between the neutral and sadness conditions are considered. Firstly, it is possible that MI has different effects on conceptual versus perceptual breadth. Specifically, sadness may not broaden conceptual scope relative to a neutral state in the same way it has been shown to broaden perceptual (i.e., attentional) scope. The current study is the first to compare the effects of negative emotions high and low in MI on conceptual categorization; therefore, it is difficult to find much support for this interpretation in the existing body of literature. Although Isen and Daubman (1984) did not consider differences in emotional MI, in their seminal study assessing cognitive categorization, there was no significant difference in ratings for weak exemplars of objects between participants who experienced a neutral state versus those who experienced what was labelled general negative affect. Nevertheless, the type of negative affect experienced by participants in their study is ambiguous (i.e., they may have experienced sadness, anger, disgust, or any combination of these, etc.), and therefore parallels between this study and the current research are difficult to draw. It is clear that more research on the potentially differential effects of emotions high and low in MI on perceptual versus conceptual scope is needed to draw conclusions with confidence.

A final possibility is that a neutral emotion state and a low MI emotion may not be very different in terms of their influence on cognitive breadth. MI theory contends that the relative broadening of the cognitive scope associated with low-MI emotions serves to "open the organism to new opportunities" (pp. 314; Harmon-Jones, et al., 2012), and perhaps the same is true for neutral emotions. Indeed, neutral emotions and emotions low in MI are similar in that they both do not generate a particularly strong urge to move toward or away from a stimulus. Thus, it is not unreasonable to suspect that an individual's cognitive breadth in a neutral state might serve to make new experiences available. This interpretation is supported by the often-

observed global bias evidenced by participants completing global-local processing tasks in a neutral state (Navon, 1977). In fact, Gable and Harmon-Jones (2010a) reported that both participants feeling sad as well as those feeling neutral responded quicker to global versus local targets in a perceptual task. This is preliminary evidence that, in terms of cognitive breadth, neutral states and negative emotions low in MI may have similar consequences. Further research must be done to confirm this interpretation, and whether or not it can be extended to neutral states versus positive emotions low in MI. Previous research comparing these two states has found a distinction between the two in the expected direction – low MI positive emotions broadened cognition relative to a neutral state (e.g., Gable and Harmon-Jones, 2008; Gable & Harmon-Jones, 2010c). Therefore, forthcoming studies should include both positive and negative emotion valences crossed with high and low emotional MI.

4.2 Misbehavior exemplars

4.2.1 Anger

Contrary to predictions made in line with the MI model, in this study, mothers feeling angry (high MI) rated the category belongingness of weak exemplars of child misbehavior higher than mothers feeling neutral. In other words, they were more inclusive with what they chose to incorporate in their mental representation of the category "child misbehavior" when angry compared to neutral. Thus, it seems that when applied to parenting-related cognitions, the MI model does not operate in the same way as when applied to neutral object-related cognitions. Despite this, the results of the current findings are not inconsistent with previous results stemming from the parenting literature. For example, Dix et al. (1990) showed that angry mothers had more negative expectations for child behavior, viewed their children's current behavior problems as worse, and made more negative attributions for child non-compliance

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compared to emotionally neutral mothers. Furthermore, Weis and Lovejoy (2002) reported that mothers' negative emotions predicted overestimations in their judgments of negative child behaviors, although it is unclear which specific emotions were evaluated.

The reasons why the MI model may not hold for judgments of child misbehavior may lie in the nature of the stimuli being evaluated. Mothers in the child misbehavior group were asked to make judgments about misbehaviors performed by children in the same age range as their own children. Child misbehaviors are distinct from object exemplars in several important ways; notably, the former stimuli involve a social evaluative component, and are personally relevant to mothers. From research in social and cognitive psychology on the effects of emotions on evaluative judgments, two major models have been proposed that could be used to explain the current study's findings regarding child misbehavior: the affect-as-information model (e.g., Clore & Parrot, 1991; 1994), and the affective-priming model (e.g., Bower, 1981). The affect-as-information model contends that, when required to make a judgment, individuals ask themselves how they feel about the target of their judgment. In this way, individuals may misattribute the particular feeling they are experiencing at the moment of judgment to the target of their judgment, rather than the true source of the feeling (Schwarz, 2001). In the current study, mothers feeling angry after viewing the film from *Crash* rated weak exemplars of misbehavior as better members of the category, compared to mothers in a calm, neutral state. An affect-as-information interpretation would state that, upon reading the target (the child misbehavior exemplars), mothers would ask themselves, "how do I feel about this?" In the anger condition, the answer to that question would have been, "upset". Further, mothers may have misattributed the source of the angry feeling to the target, rather than the preceding film, and thus their evaluations of the target were particularly negative. Alternatively, in the neutral condition, the

answer to the question would have been, "calm", and thus their judgments of the target were not negatively biased. Such an interpretation highlights the potentially negative consequences of outside sources of anger (e.g., marital conflicts) on parent-child interactions. Indeed, there is a robust association between inter-parental conflict and parenting behaviors, such that effective parenting is disrupted in situations of high inter-parental discord (Fincham & Hall, 2005). It is possible that mothers may feel angry due to conflicts with their spouse, and then misattribute this anger to ambiguous child behaviors, compromising their parenting.

On the other hand, the affective-priming model contends that an individual's pre-existing ideas and memories are major determinants of their interpretations of complex social stimuli (Forgas, 1995). In this model, emotions function as memory units, which are associated with simultaneously-encoded concurrent events. The activation of a particular emotion facilitates the retrieval of the events associated with it, and also primes emotion-congruent themes in subsequent thinking and judgments (Bower, 1981). As Dix and colleagues (1990) have suggested, child misbehaviors may activate anger-related cognitions in mothers such as memories of previous difficult interactions with their child, which may then influence subsequent judgments of child misbehavior (Pasupathi, 2001). Extending this line of thought to the current study, the feelings of anger induced, coupled with the presentation of negative child behavior stimuli, may have activated pre-existing maternal cognitions regarding child misbehavior and potential frustration associated with these behaviors. In turn, an increased sensitivity to similar information is facilitated, observed in this study as higher ratings for ambiguous examples of child misbehavior. There is not much evidence to favor either the affect-as-information model or the affective-priming model to explain the differences between the anger and neutral conditions in this study, and it is possible that both are true to some degree:

mothers may have used the both anger they experienced as well as the cognitive schema activated by their emotion to inform their decision-making regarding the child misbehaviors.

Although the findings from the current study seem to suggest that the MI model dissolves when applied to mothers' interpretations of child-related stimuli, deeper thought reveals that this in fact might not be the case. Dix (1991) conceives of anger as "prepar[ing] people to perceive and remove obstruction" (p. 5). For example, the anger experienced by parents as a result of child non-compliance promotes parenting behaviors aimed at reducing the non-compliance. Furthermore, MI theory states that motivationally intense emotions such as anger alter cognitive processes to assist in goal-directedness (Harmon-Jones et al., 2012). Proponents of MI theory have previously proposed that a narrowed cognitive scope facilitates the goal at hand. As reviewed above, this has been shown to be true for attentional focus because peripheral visual stimuli that may act as distractors are ignored. However, if an angry parent's goal were to notice and deal with hindrances due to child misbehavior, then indeed a broadening of the cognitive scope at a conceptual level would be more conducive to this goal.

In sum, with respect to maternal cognitions about child misbehavior, the results of the current study suggest that the experience of anger leads to a broadening of the conceptual scope relative to a neutral state. The use of anger as information to guide decision-making, as well as the activation of anger-related schema in mothers are potential mechanisms for this effect, which may then facilitate mothers' mitigation of the aversive situation (in this case, child non-compliance or misbehavior), through parenting behaviors motivated by the goal of reducing the non-compliance or misbehavior.

4.2.2 Sadness

Contrary to predictions made in line with the MI model, in this study, mothers feeling sad (low MI) did not rate the category belongingness of weak exemplars of child misbehavior differently than mothers feeling neutral. In other words, the breadth of mothers' mental representation of the category "child misbehavior" when they felt sad was similar to when they felt neutral. One potential reason for this is a methodological limitation of the current study. The film clip used to induce sadness, drawn from *The Champ*, featured a young boy experiencing significant distress over the loss of his father figure. This child was in the same age range as the children of the mothers in this study, and therefore viewing the clip may have had the indirect effect of making mothers particularly sympathetic towards children and perhaps more forgiving of child misbehavior, and so their ratings of weak exemplars of child misbehavior were lower than expected. Thus, had another clip been used, different effects may have been observed. In addition, there are also several theoretical explanations for the current study's findings regarding the effects of sadness on mothers' categorizations of child misbehaviors, discussed below.

Research examining the effect mothers' short-term emotional experiences of sadness on their perceptions of child behavior is sparse. Rather, many studies in the parenting literature have examined the effect of symptoms of depression, a psychological disorder often characterised by a sad mood. These investigations have tested the depression-distortion hypothesis, which states that mothers with depressive symptoms are biased raters of their children's behavior and tend to over-report child behavior problems. However, a very plausible alternative to depressive distortion is that mothers with depressive symptoms are simply more sensitive to actual elevated levels of problems in their children (Richters & Pellegrini, 1989). Research in this area has been mixed, with some studies finding support for a slight depressive distortion (e.g., Gartstein,

Bridgett, Dishion, & Kaufman, 2009; Mowbray, Lewandowski, Bybee, & Oyserman, 2005), and others finding support for mothers' accuracy (e.g., Conrad & Hammen, 1989; Richters & Pellegrini, 1989). Thus, it is unclear whether depressive symptoms produce negative distortions in maternal perceptions, and when they have been found to do so, the effects have been modest (e.g. Gartstein et al., 2009). The results of the current study offer new information suggesting that feelings of sadness do not lead to distortions in mothers' judgments of child behavior compared to neutral feelings. Nevertheless, given that previous studies have examined depressed mood rather than sad feelings, and mothers' perceptions of their own rather than hypothetical children, further research in this area is necessary.

The social and cognitive psychology literatures may also elucidate the findings of the current study regarding mothers' judgments of child misbehavior in the anger and sadness conditions. A series of studies in this area showed that the experience of anger led to a greater use of heuristic cues in social judgment relative to a neutral state and sadness, which did not differ from each other (Bodenhausen, Sheppard, & Kramer, 1994). The authors argued that sad individuals engage in more thoughtful, systematic social judgment processes, relative to angry individuals. This interpretation is consistent with the results of the current study; it is possible that mothers feeling sad viewed the weak misbehavior exemplars and engaged in a thoughtful cognitive process, perhaps involving a consideration of different explanations for the child's ambiguous behavior, and ultimately arrived at a decision similar to mothers feeling neutral. On the other hand, mothers in the angry conditions may have automatically interpreted and classified ambiguous misbehavior as better examples of child misbehavior, without engaging in a more thoughtful judgment process. Indeed, research has shown that angry individuals make more other-person-specific causal attributions for ambiguous scenarios compared to sad individuals,

who make more situation-specific, arguably more considered, causal attributions (Keltner, Ellsworth, & Edwards, 1993). Unfortunately, much research in this area compares feelings of anger and sadness, but does not include a neutral comparison group; therefore, direct parallels with the current study are difficult to draw. A post-hoc analysis of the present data comparing the anger and sadness conditions reveals that participants in the former condition rated weak misbehavior exemplars significantly higher than participants in the latter, $F(1, 102) = 11.00$, $p = .001$, $d = .47$. These results are consistent with previous research showing differential effects of anger and sadness, and suggest that, for cognitive categorization, sadness may more closely resemble a neutral state, rather than produce a distinct effect of its own.

Finally, as Isen and Daubman (1984) suggested, it is also possible that participants who underwent a sadness manipulation engaged in a process of mood repair, whereby they focused their attention on positive material in order to feel better (Josephson, 1996). After a few moments of engaging in mood repair, mothers in the sadness condition may have felt less sad and perhaps more neutral, thus rating weak exemplars of misbehavior similarly to mothers in the neutral condition. Mood repair may not have occurred to the same degree for participants in the anger condition because of the high MI of anger; as stated previously, mothers may have already been motivated to reduce hindrances associated with child misbehavior, and thus less motivated to repair their negative emotion state.

In sum, with respect to maternal cognitions about child misbehavior, the results of the current study suggest that mothers feeling sad make similar judgments to, and angry mothers make more inclusive judgments than, mothers feeling neutral. Although these findings are not completely in line with MI theory at first glance, further reasoning enables the dovetailing of the parenting, social cognitive, and MI theories to explain the present findings. In an interesting

study, Smith and Ellsworth (1985) used dimensions of cognitive appraisal to differentiate the emotional experience of 15 states including sadness and anger. Sadness was characterised by strong situation-specific attributions and beliefs that the unpleasant situation is caused by external factors beyond one's control, and nothing can be done to rectify it. On the other hand, anger was characterized by other-responsibility attributions, but also a strong sense of human agency. Applied to the current study, mothers' experiences of anger may have facilitated goal-directed behavior (to reduce misbehavior and correct the situation) by broadening cognition and increasing sensitivity to goal-relevant information. Furthermore, the motivation to work towards the goal may stem from an underlying sense of human agency created by the experience of the anger. Alternatively, mothers' experiences of sadness may not have generated the motivation to work towards a goal, perhaps because of an underlying sense that the situation not in their control. Therefore, they responded similarly to neutral mothers. Future research evaluating mothers' attributions for child misbehavior, as well as their sense of personal agency and control over the negative situation following the induction of anger and sadness, could provide further support for this interpretation.

4.3 Good behavior exemplars

Again, contrary to predictions made by the MI model, in this study, no differences in ratings for weak exemplars of child good behavior were observed between the anger and neutral conditions, or between the sadness and neutral conditions. In other words, the experience of emotions high and low in MI did not seem to alter mothers' cognitive breadth with respect to their mental representation of the category "child good behavior". No studies in the parenting literature have examined the effects of negative emotions on maternal perceptions of positive child behaviors. The results of the current study offer preliminary evidence that maternal judgments of good

behavior in children are unaffected by anger and sadness, suggesting that despite the experience of negative emotions, mothers are capable of perceiving and judging positive aspects of child behavior in the same way as mothers feeling neutral. Furthermore, the results of the current study are consistent with previous research on social categorization by Isen et al. (2002), which showed that the effect of emotion on categorization disappeared when the valence of the emotion (negative) did not match the valence of the target category (positive). These authors argued that, in general, individuals think more flexibly and broadly about positive material than negative material. This interpretation is supported by the current data, which showed that ratings for child good behaviors were the highest compared to neutral objects and child misbehaviors. With respect to MI, this study's failure to find a difference in ratings of ambiguous good behaviors between the three emotion conditions suggests that variations in MI may not be relevant to the cognitive categorization of stimuli the valence of which is incongruent with the valence of the experienced emotion. However, given that the effects of positive emotions on perceptions of negative stimuli were not assessed, it is uncertain whether the current results are due to solely to the positive nature of the stimuli being categorized, or the mismatch between emotion valence and stimuli valence, or a combination of the two. Clearly, future research examining the effects of emotion valence, emotional MI, as well as stimulus valence is warranted.

4.4   Strengths and limitations

This study added to the extant literature in several ways. Firstly, it is the only study to have examined the effects of negative emotions high and low in MI and a neutral state on conceptual categorization. One other study has compared negative emotions high and low in MI (disgust, sadness) with a neutral state, however that investigation evaluated perceptual breadth only (Gable & Harmon-Jones, 2010a). Results from the current study offer preliminary evidence to

suggest that emotions low in MI may have slightly different effects on cognitive categorization than on attentional focus. Furthermore, this study was the first to experimentally induce emotions in mothers and subsequently evaluate their child-related cognitions. These results suggest that mothers feeling angry do in fact have a lower threshold for what they determine to be misbehavior. Furthermore, the findings offer preliminary evidence that different negative emotions may have distinctive influences on maternal judgments of child misbehavior. The high internal validity of this study design compliments they myriad of correlational studies with high external validity that have been conducted to date in parenting research. Finally, this study also evaluated mothers' judgments of good child behaviors, a topic that has been understudied in the parenting literature. Results from this investigation suggest that maternal perceptions of good behavior may not be as susceptible to the effects of negative emotions as are their perceptions of misbehavior.

Despite these strengths, several limitations of the current research must be acknowledged. Firstly, the study was slightly underpowered to detect an interaction between MI and type of category rated. It is likely that a larger sample size will have enough power to elucidate this interaction. Secondly, discrete anger was difficult to elicit in this study. Rather, the results from the manipulation check indicate that mothers were likely experiencing a mixture of anger, anxiety, disgust, and fear. As described above, eliciting pure anger is a common difficulty in emotion research. From an MI standpoint, this limitation does not pose serious consequences, as anger, anxiety, fear, and disgust are all negative emotions conceptualized as high in MI; nevertheless, results should be interpreted with this caveat in mind. Finally, although the sadness induction did seem to be successful, the clip used in this study may have inadvertently caused

mothers to feel more sympathetic towards children, as discussed above. Therefore, the effects of sadness on ratings of child behaviors may have been confounded with compassion.

4.5 Future directions

The potential for future research in this area is vast. The overwhelming majority of existing studies on the relationship between parental emotions and cognitions have been conducted using samples of mothers. Given previously documented gender differences in the expression of emotions (e.g., Shields, Garner, Di Leone, & Hadley, 2006) as well as mother-father differences in perceptions of child behavior (e.g., De Los Reyes & Kazdin, 2005), a future step in this line of research is to test the effects of anger and sadness in a sample of fathers. Furthermore, future studies should examine the effects of positive emotions high (e.g., love, affection) and low (e.g., amusement) in MI on parental perceptions of child behaviors. The inclusion of positively valenced emotions would also allow for a more complete analysis of the conditions under which particular emotions influence judgments about particular targets. For example, are effects only observed when emotion valence and target valence are congruent? What are the contributions of MI and goal-directedness to these relationships?

Finally, future research should examine these relationships in a clinical sample. As noted above, judgments of the wrongness of child behaviors moderate parenting behaviors and are particularly important to understanding harsh parenting, especially in parents at risk of abuse (Milner, 2003). The current findings suggest that the experience of motivationally intense emotions such as anger cause mothers to overestimate the wrongness of child misbehaviors. This could lead mothers to engage in overreactive discipline, and at an extreme, abusive behavior. Provided these results are replicated in future studies, treatments targeting parents at risk of

abuse might place a primary focus on learning strategies for regulating motivationally intense

emotions, to preclude these from biasing parental judgments in a detrimental way.

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Appendices

Appendix A: Recruitment Flyer

Hi Moms!

If you are the **mother of a 7-10 year old boy or girl**, we need you to help with a study at UBC!

We are studying emotions and how they influence the ways that individuals make judgments about other people and objects in the environment. Participating mothers will visit the Parenting Lab at the University of British Columbia to answer questionnaires, view short film clips, and do a simple categorization task.

Compensation
Mothers will receive a **$15 honorarium** for their participation after their lab visit.

How to get involved
Appointments are scheduled for mothers to come to the UBC Parenting Lab at a time convenient for them (e.g., evenings, weekends).
This study takes about **1 hour** to complete.

Participation in this research project is entirely voluntary.

Contact us for more details

Appendix B: Exemplars of Object Categories

Vehicle:

Strong:
Automobile
Truck
Bus
Taxi

Weak:
Raft
Horse
Rocket

Carpenter's tool:

Strong:
Saw
Hammer
Screwdriver
Drill

Weak:
Blueprints
Knife
Glue

Clothing:

Strong:
Pants
Shirt
Dress
Blouse

Weak:
Cape
Belt
Purse

Appendix C: Exemplars of Child Misbehavior

Strong:

A child made fun of another student at school
A child cheated on a test at school
A child threw another child's lunch in the trash
A child insulted his/her parents
A child tore up his/her friend's art project
A child scratched the paint on a car with a pen
A child hit his/her younger sibling
A child lost his/her temper at the store
A child stole the 20$ bill his/her parent left on the counter
A child took a bracelet from a store
A child laughed at a person in a wheelchair
A child repeatedly phoned an elderly neighbor and hung up

Weak:

A child teased the pet cat
A child didn't clean up after he/she was finished playing
A child tattled on his/her sibling
A child interrupted the teacher during class
A child did not want to try a new food at dinner
A child wanted to be the center of attention at a friend's birthday party
A child got impatient waiting in line at a grocery store
A child called his/her teacher by his/her first name
A child arrived late to class after break

Appendix D: Exemplars of Child Good Behavior

Strong:

A child stayed behind to walk home with his/her younger sibling
A child offered to help his/her cousin at the soup kitchen
A child stayed home to keep his/her mom company when she felt sick
A child gave up his/her seat on the bus to a boy on crutches
A child helped set the table for dinner
A child finished his/her homework before going out to play
A child would like to help at a fundraiser
A child put away his/her toy without being told
A child was nice to the new student in his/her class
A child donated three of his/her toys to charity
A child asked permission before taking a toy
A child asked his/her mom to take some of his/her clothes to the Salvation Army

Weak:

A child got an A on the spelling test
A child saved his/her allowance money
A child didn't waste any of his/her lunch
A child won a medal for a school project
A child took good notes in class
A child listened to the instructions before beginning the game
A child didn't talk during the movie
A child wore a hat when the temperature outside was cold
A child scored three goals for his/her team

Appendix E: Family Information Questionnaire

Part I: General Family Information

First name of child: _____

1. What is your child's date of birth? _____ (dd/mm/yyyy)

2. Gender? M / F

3. What grade is your child in? _____

4. Was your child adopted?

    ☐ Yes. Age at adoption: _____
    ☐ No, my child is not adopted.

5. Do you have any other children?

    ☐ Yes. Please write their age(s) and gender(s) below.

        _____ _____

        _____ _____

        _____ _____

        _____ _____

    ☐ No, I do not have any other children.

6a. Has your child been diagnosed with any disorders, behaviour problems, or learning, developmental, or neurological problems?

    ☐ Yes. Please describe: _____

    ☐ No.

For questions 7-9, please do not count the time your child is asleep or at school.

7. On average, how many hours per week do you work outside the home? (If applicable)

                      _____ hours/week

8. On days when you work outside the home, how much time do you spend taking care and doing things with your child? (If applicable)

                      _____ hours/day

9. On days when you do not work outside the home, how much time do you spend taking care and doing things with your child? (If applicable)

_____ hours/day

Part II: Mother Information

10. What is your relationship to _____?

☐ Biological mother

☐ Step-mother

☐ Adoptive mother

☐ Other, please explain: _____

11. How old are you? _____ (years)

12. How would you describe your ethnicity? _____

13. On a scale of 1 to 10, where 1 is not at all, and 10 is completely, how much do you identify yourself as Canadian? (circle one)

1 ------- 2 ------- 3 ------- 4 ------- 5 ------- 6 ------- 7 ------- 8 ------- 9 ------- 10
Not at all   Completely

14. What is your level of education?

☐ Less than grade 7

☐ Junior high school

☐ Partial high school (grade 10 or 11)

☐ High school graduate

☐ Partial college/university (min. 1 year) or special training

☐ Standard college or university graduate (i.e.: B.A., B.Ed.)

☐ Graduate or professional training (i.e.: M.A., PhD)

15. Are you currently employed?

☐ Yes. Please briefly describe your occupation:

_____

☐ No, I am not currently employed.

16. Please check your household income category (before taxes) for this past year:

☐ Less than $5000 q $75 000 - $99 999

☐ $5000 - $19 999 q $100 000 - $149 999

☐ $20 000 - $34 999 q $150 000 - $199 999

☐ $35 000 - $49 999 q $200 000 and higher

☐ $50 000 - $74 999

17. What is your marital status?

☐ Married or common law. How many years? _____

☐ Divorced or separated

☐ Widowed

☐ Single

Appendix F: Brief Symptom Inventory

The following is a list of problems people sometimes have. Please read each one carefully, and blacken the circle that best describes how much that problem has distressed or bothered you during the last 7 days including today. Blacken the circle for only one number for each problem and do not skip any items. If you have any questions, please ask them now.

0 = not at all
1 = a little bit
2 = moderately
3 = quite a bit
4 = extremely

		0	1	2	3	4
1.	Nervousness or shakiness inside	☐	☐	☐	☐	☐
2.	Faintness or dizziness	☐	☐	☐	☐	☐
3.	The idea that someone else can control your thoughts	☐	☐	☐	☐	☐
4.	Feeling others are to blame for most of your problems	☐	☐	☐	☐	☐
5.	Trouble remembering things	☐	☐	☐	☐	☐
6.	Feeling easily annoyed or irritated	☐	☐	☐	☐	☐
7.	Pains in heart or chest	☐	☐	☐	☐	☐
8.	Feeling afraid in open spaces or on the streets	☐	☐	☐	☐	☐
9.	Thoughts of ending your life	☐	☐	☐	☐	☐
10.	Feeing that most people cannot be trusted	☐	☐	☐	☐	☐
11.	Poor appetite	☐	☐	☐	☐	☐
12.	Suddenly scared for no reason	☐	☐	☐	☐	☐
13.	Temper outbursts that you could not control	☐	☐	☐	☐	☐
14.	Feeling lonely even when you are with people	☐	☐	☐	☐	☐
15.	Feeling blocked in getting things done	☐	☐	☐	☐	☐
16.	Feeling lonely	☐	☐	☐	☐	☐
17.	Feeling blue	☐	☐	☐	☐	☐
18.	Feeling no interest in things	☐	☐	☐	☐	☐
19.	Feeling fearful	☐	☐	☐	☐	☐
20.	Your feelings being easily hurt	☐	☐	☐	☐	☐
21.	Feeling that people are unfriendly or dislike you	☐	☐	☐	☐	☐
22.	Feeling inferior to others	☐	☐	☐	☐	☐
23.	Nausea or upset stomach	☐	☐	☐	☐	☐

24. Feeling that your are watched or talked about by others ☐ ☐ ☐ ☐ ☐

25. Trouble falling asleep ☐ ☐ ☐ ☐ ☐

26. Having to check and double-check what you do ☐ ☐ ☐ ☐ ☐

27. Difficulty making decisions ☐ ☐ ☐ ☐ ☐

28. Feeling afraid to travel on buses, subways, or trains ☐ ☐ ☐ ☐ ☐

29. Trouble getting your breath ☐ ☐ ☐ ☐ ☐

30. Hot or cold spells ☐ ☐ ☐ ☐ ☐

31. Having to avoid certain things, places, or activities ☐ ☐ ☐ ☐ ☐
    because they frighten you

32. Your mind going blank ☐ ☐ ☐ ☐ ☐

33. Numbness or tingling in parts of your body ☐ ☐ ☐ ☐ ☐

34. The idea that you should be punished for your sins ☐ ☐ ☐ ☐ ☐

35. Feeling hopeless about the future ☐ ☐ ☐ ☐ ☐

36. Trouble concentrating ☐ ☐ ☐ ☐ ☐

37. Feeling weak in parts of your body ☐ ☐ ☐ ☐ ☐

38. Feeling tense or keyed up ☐ ☐ ☐ ☐ ☐

39. Thoughts of death or dying ☐ ☐ ☐ ☐ ☐

40. Having urges to beat, injure, or harm someone ☐ ☐ ☐ ☐ ☐

41. Having urges to break or smash things ☐ ☐ ☐ ☐ ☐

42. Feeling very self-conscious with others ☐ ☐ ☐ ☐ ☐

43. Feeling uneasy in crowds, such as shopping or at a movie ☐ ☐ ☐ ☐ ☐

44. Never feeling close to another person ☐ ☐ ☐ ☐ ☐

45. Spells or terror or panic ☐ ☐ ☐ ☐ ☐

46. Getting into frequent arguments ☐ ☐ ☐ ☐ ☐

47. Feeling nervous when you are left alone ☐ ☐ ☐ ☐ ☐

48. Others not giving you proper credit for your emotions ☐ ☐ ☐ ☐ ☐

49. Feeling so restless you couldn't sit still ☐ ☐ ☐ ☐ ☐

50. Feelings of worthlessness ☐ ☐ ☐ ☐ ☐

51. Feeling that people will take advantage of you if you let them ☐ ☐ ☐ ☐ ☐

52. Feelings of guilt ☐ ☐ ☐ ☐ ☐

53. The idea that something is wrong with your mind ☐ ☐ ☐ ☐ ☐

Appendix G: Strengths and Difficulties Questionnaire

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of the child's behavior over the last six months or this school year.

	Not True	Somewhat True	Often True
Considerate of other people's feelings	☐	☐	☐
Restless, overactive, cannot stay still for long	☐	☐	☐
Often complains of headaches, stomach-aches or sickness	☐	☐	☐
Shares readily with other children, for example toys, treats, pencils	☐	☐	☐
Often loses temper	☐	☐	☐
Rather solitary, prefers to play alone	☐	☐	☐
Generally well behaved, usually does what adults request	☐	☐	☐
Many worries or often seems worried	☐	☐	☐
Helpful if someone is hurt, upset or feeling ill	☐	☐	☐
Constantly fidgeting or squirming	☐	☐	☐
Has at least one good friend	☐	☐	☐
Often fights with other children or bullies them	☐	☐	☐
Often unhappy, depressed or tearful	☐	☐	☐
Generally liked by other children	☐	☐	☐
Easily distracted, concentration wanders	☐	☐	☐
Nervous or clingy in new situations, easily loses confidence	☐	☐	☐

Kind to younger children	☐	☐	☐
Often lies or cheats	☐	☐	☐
Picked on or bullied by other children	☐	☐	☐
Often offers to help others (parents, teachers, other children)	☐	☐	☐
Thinks things out before acting	☐	☐	☐
Steals from home, school or elsewhere	☐	☐	☐
Gets along better with adults than with other children	☐	☐	☐
Many fears, easily scared	☐	☐	☐
Good attention span, sees work through to the end	☐	☐	☐

Thank you very much for your help

Appendix H: Differential Emotions Scale

Please indicate, on a scale of 1-7, the extent to which you felt each of the following states while watching the film clip (1 = *not at all*, 7 = *very intense*).

Interested, concentrated, alert	_____
Fearful, scared, afraid	_____
Anxious, tense, nervous	_____
Moved	_____
Angry, irritated, mad	_____
Ashamed, embarrassed	_____
Warm hearted, gleeful, elated	_____
Joyful, amused, happy	_____
Sad, downhearted, blue	_____
Satisfied, pleased	_____
Surprised, amazed, astonished	_____
Loving, affectionate, friendly	_____
Guilty, remorseful	_____
Disgusted, turned off, repulsed	_____
Disdainful, scornful, contemptuous	_____
Calm, serene, relaxed	_____