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Activative Fathering Predicts Later Children's Behaviour Dysregulation and Sociability

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Abstract

This study examined activative fathering observed during father-child interactions in the family home, focusing on the relation between activative fathering at child age 4 and children's behaviour dysregulation and sociability at child age 5. One hundred twenty-seven families participated in the study. Activative fathering was associated with later lower child dysregulation during a problem solving task, higher dysregulation during a wait task, and higher sociability in the home. Contrary to expectations, paternal control did not moderate these relations. Results are discussed in relation to father-child activation relationship theory.

Keywords

activation relationship; attachment; fathering; self-regulation; dysregulation; sociability

Introduction

The past few decades have seen increased research devoted specifically to investigating fathers' influences on the family (Lamb, 2004; Lamb & Tamis-LeMonda, 2004). Although fathers still spend less time than mothers with their children, fathers have increased the amount of time spent in direct engagement with their children by some estimates up to 2/3 that of mothers (Pleck, 1997; Yeung, Sandberg, Davis-Klean, & Hofferth, 2001). In addition, fathers now provide more daily physical and emotional care to their children (Goldscheider & Waite, 1991; Pleck & Pleck, 1997). These changes in the father's role have occurred in the context of U.S. societal role expectations that are less strict than that of mothers, which some argue, make the father's role in the family more varied, culturally sensitive, and multiply determined (Lupton & Barclay, 1997; Marsiglio, Day, & Lamb, 2000). In general, research indicates that fathers make a unique contribution to children's well-being above and beyond the contributions of mothers (Lamb & Lewis, 2010; Palkovitz, 2002).

Although research on fatherhood has made great advances in recent years, there exists no accepted unified theoretical perspective that identifies the qualities that make a "good" father and enumerates paternal mechanisms of influence on children's development. A review of research on father involvement with young children (ages 0-6), covering research published from 1990-2005, identified a total of 90 empirical, peer-reviewed articles of which about half failed to include some guiding theoretical framework (Downer, Campos, McWayne, & Gartner, 2008). The authors criticized the field's lack of a theoretical underpinning with which to guide research on fathering. Although the construct of father involvement has seen a great deal of theoretical work (Pleck, 2010; Palkovitz, 2002), the

larger literature lacks theory specific to the nature of father-child relationships, especially with regard to critical attachment processes.

According to attachment theory (Bowlby, 1969; Ainsworth, 1972), children benefit most when they have a strong attachment to their primary caregivers. These close attachment relationships provide children with a secure base that enables them to explore the world and, over time, this parent-child bond forms the basis for internal working models of the self in relation to others. The attachment system is considered to have two important components that influence a child's later social abilities: 1) the extent to which parents provide a secure base, and 2) the extent to which parents encourage the child to explore (Bowlby, 1979). However, current conceptualizations of attachment theory have been criticized for being too narrow in scope to fully encompass fathers' influences on children as they grow older and incorporate the unique ways in which fathers interact with their children (Pleck, 2007).

There is no current consensus in the literature, yet many scholars are beginning to view the father's role as more central to the exploration system, which is thought to complement the mother's role as more central to providing a secure base (Grossmann, Grossmann, Fremmer-Bombik, Kindler, Scheurer-Englisch, & Zimmerman, 2002; Pleck, 2007). Indeed, recent research has suggested that there may be important differences between mothers and fathers in the style of attachment relationships they provide (Paquette, 2004; Grossmann et al., 2002). For example, mothers tend to provide security in times of distress whereas fathers tend to provide challenging support as a play companion (Grossmann et al., 2002). Fathers are also more physical, stimulating, and unpredictable, using fewer objects in interactions with infants, whereas mothers are more verbal, didactic, and use more visual play with objects when interacting with their infants (Power & Parke, 1983; Yogman, 1981). In an attempt to address the unique characteristics of father-child relationships, a theoretical formulation by Paquette (2004) builds on the foundational work of attachment theory and empirical work with humans and primates to propose that father-child attachment should be differentiated from mother-child attachment. Paquette argues that the father-child attachment relationships should be re-conceptualized as an 'activation' relationship, whereby fathers provide more excitatory, destabilizing, and challenging environments, facilitating the process of exploration and opening children to the world in contrast to the safety provided by the mother-child attachment. The fathering behaviour associated with this relationship, referred to here as "activative fathering", uniquely engages children's self-regulatory systems, encourages risk taking, and increases self-confidence particularly in unfamiliar situations through the use of a combination of stimulation, destabilization, and limit setting. Fathers are thought to accomplish this through the use of specific behaviours such as encouraging risk-taking (Kromelow, Harding & Touris, 1990), using objects in unusual ways, and teasing to challenge children emotionally and cognitively in play (Labrell, 1996; 1997). In addition, fathers stimulate children verbally by using words beyond the scope of the child's vocabulary (Ratner, 1988), more complex sentences, imperatives, and attention-getting phrases (Rondal, 1980). Lastly, fathers spend a greater proportion of time with their children in physical play than do mothers (Power & Parke, 1983), and engage in more vigorous physical play with their children during playtime (MacDonald & Parke, 1986). These behaviours are proposed to give the child practice in dealing with a less predictable play partner and improve self-regulatory abilities during highly arousing contexts (Paquette, 2004).

Father-child activation relationship theory places specific emphasis on the most common form of father-child physical play after the first year, rough-and-tumble play (RTP), which includes behaviours such as kicking, wrestling, grappling, and tumbling (Pellegrini & Smith, 1998). Paquette (2004) highlights the importance of RTP between fathers and their offspring as a crucial context for the father-child activation relationship, especially the non-punitive

establishment of dominance on the part of the father during play, protection against injury due to imposed rules, encoding own and decoding other's emotional signals, improving the regulation of anger and the expression of anger to prevent aggression, and the promotion of healthy competition. However, in addition to physically stimulating the child during play, fathers also play an important role in their children's cognitive development (Cabrera, Shannon, & Tamis-LeMonda, 2007; Labrell, 1996) and self-reliance (NICHD Early Child Care Research Network, 2008). Thus, fathers' activative interactions with their children may serve less to provide a secure base and more to encourage children to explore their environments, broaden and build cognitive abilities, while providing children with an opportunity to practice regulating and responding appropriately in arousing situations with effective limit-setting.

One of the most important constructs thought to underlie the development of psychopathology is children's ability to regulate their emotions and behaviours during times of arousal in a manner appropriate to the context. Although the measures, methods and definitions vary widely, a vast body of work has explored the construct of self-regulation (Thompson, 1994). Dysregulation may indicate the absence of regulation but importantly children who are highly dysregulated typically have developed maladaptive patterns of emotion and behaviour regulation that impair functioning and become symptoms of psychopathology (Cole, Michel, & Teti, 1994). Research has suggested that young children's successful emotion and behaviour regulation relies heavily on the external influences of parents, however as children mature they begin to rely less on parents and external sources for emotion regulation (Thompson, 1994). Indeed, a broad range of parental influences have been shown to affect young children's self regulation, including social referencing and modelling (Parke, 1994; Silk, Shaw, Skuban, Oland, & Kovacs, 2006), emotion-coaching (Gottman, Katz, & Hooven, 1996, 1997), reactions to emotions (Eisenberg, Gershoff, Fabes, Shepard, Cumberland et al., 2001), parent emotional expressivity (Michalik, Eisenberg, Spinrad, Ladd, Thompson, & Valiente, 2007), use of discipline that promotes learning (Hoffman, 2000; Krevans & Gibbs, 1996), parental teaching of emotion regulation strategies (Morris, Silk, Steinberg, Myers, & Robinson, 2007), emotional climate of the family (Cummings & Davies, 1996;), attachment (Gilliom, Shaw, Beck, Schonber, & Lukon, 2002), parenting style (Parke & Buriel, 1998; Kliwer, Fearnow, & Miller, 1996) and non-punitive dominance on the part of fathers (Flanders, Leo, Paquette, Pihl, & Séguin, 2009). It is crucially important to consider fathers' influences on the development of children's self-regulatory abilities, given the strong link between parenting and children's emotion and behaviour regulation. In addition, identifying a relation between activative fathering and children's emotion and behaviour regulation would provide greater empirical support for the theorized father-child activation relationship.

The increase in research on fatherhood has led to one enduring finding: fathers appear to be particularly important to children's social development (Leidy, Schofield, & Parke, in press; Parke & Buriel, 2006). Fathers influence their children's social abilities through three major mechanisms: 1. the quality of the father-child relationship, 2. controlling access to peers and activities, and 3. direct advice about peer relationships (McDowell & Parke, 2009). Parke and colleagues (2004) have argued that fathers and mothers influence children's development of peer relationships in unique ways. Specifically, playful, physical, affectionate, and engaging father-child interactions tend to be associated with later popularity, whereas for mothers it is mother-child verbal interactions that are related to later popularity (McDowell & Parke, 2009; Macdonald & Parke, 1984; Parke & O'Neil, 2000; Barth & Parke, 1993; Mize & Pettit, 1997). In addition father-child attachment relations have been related to children's anxious/withdrawn behaviour problems in preschool (Verchueren & Marcoen, 1999), peer acceptance, sociometric status, and shyness in later childhood (Verchueren & Marcoen, 2002, 2005).

Finally, father-child activation relationship theory (Paquette, 2004) holds that fathers who are stimulating, destabilizing, and physically arousing with their children must also use non-punitive control to establish limits for children to receive optimal benefit. Paquette and Bigras (2010) identified three types of activation categories: children who are “under-activated”, “activated” and “over-activated”. Under-activation is thought to be associated with parental overprotectiveness and results in children who engage in limited exploration. Activation is associated with optimal activative fathering and results in children who explore their environment with confidence and prudence, but follow parental limits. Over-activation is thought to be closely related to parental difficulty in gaining child obedience and results in children who explore without caution and do not follow parental limits. Although this study cannot classify the types of activation relationships characterized above, it explores whether paternal control moderates the relations between activative fathering and children’s behaviour dysregulation and sociability such that fathers who engage in excitatory behaviour also need to display higher levels of control in order to promote social skills and decrease dysregulation in children. Paternal dominance has previously been found to moderate the relation between father-child rough-and-tumble play and child aggression such that higher levels of paternal dominance were required for children to display less aggression (Flanders et al., 2009). In line with this notion, research has consistently found authoritative paternal parenting to be associated with decreased internalizing and externalizing problems in children (Marsiglio, Amato, Day, & Lamb, 2000). As such, the optimal “activation relationship” involves fathers who spend time with children in stimulating and challenging interactions, while appropriately setting limits.

Current Study

Few studies exist that have examined father-child activation relationship theory and its relation to critical child competencies. In addition, none have assessed fathering in a naturalistic home setting without activity restrictions imposed by a laboratory setting. The following hypotheses are proposed: 1. Activative fathering will be associated with later lower children’s dysregulation during a problem solving task. 2. Activative fathering will be associated with later lower children’s dysregulation during a wait task. 3. Activative fathering will be associated with later higher child sociability. 4. Paternal control will moderate the relation between activative fathering and child behaviour dysregulation and sociability, such that the relation will be stronger when fathers utilize high control.

Methods

Participants

Participants were drawn from a larger multi-site, longitudinal (ages 3 to 9 years) investigation of family processes, emergent regulatory functioning, and the development of psychopathology in children. Families resided in rural Pennsylvania or Southern California, and were excluded from the study if a child had a history of abuse, severe neurological impairment, or was non-ambulatory. Families were chosen from the two sites in order to have both rural and urban populations included in the sample. Participants for the present study included 127 fathers and children. Ethnicity was as follows: 62% Caucasian, 9% Hispanic, 9% African American, 4% Asian, and 16% multi-racial. Fathers ranged in age from 24 to 58 (mean = 37.54), 87.5% were married, 57.4% had a college degree, and the median family income was 50,000 to 70,000. No families dropped out of the study during the 2 year period of the study (48 month lab visit through 60 month lab and home visits).

Procedure

Naturalistic Home Observations—Home observations took place at a time when the entire family was in the home, usually around dinnertime. At child age 4 and 5, fathers and

children were observed for 60 minutes by two graduate students. Families were instructed to “act as you normally do” during observation. The two observers avoided eye contact and verbal interaction and stood in an unobtrusive area that gave them a clear view of the father’s and target child’s faces. The child and father were observed for 6, 10 minute epochs at age 4, and for 4, 10 minute epochs at age 5, after each of which the observer would take 5 minutes to rate behaviours. Observers were trained through watching videotaped home observations and attending live home observations with an experienced coder. Reliability was defined as 70% exact agreement and 95% agreement within one point on the coding scale with the master coder. To maintain cross-site reliability (Los Angeles and Central Pennsylvania), a master coder was designated at each site. Inter-site reliability was based on videotaped home observations, and within-site reliability was assessed using videotapes and live home observations. Kappas for within and inter-site reliability were .6 or higher each year.

Laboratory visits—During each annual lab visit, mother-child interactions and child behaviours were videotaped during standardized lab tasks designed to assess child regulatory behaviour. The present study used observational data from the problem solving #1 task and the wait task at child age five. The problem solving #1 task (2 min) was a block design task where the child had to match red and white coloured blocks to a picture on a card, designed to be finished with minimal aid from mothers. Mothers were instructed to first let the child try the task on his or her own, and subsequently provide whatever help they thought was needed for successful completion. Although mothers were able to help their child complete the task, the behaviour dysregulation coding system assesses the child independently of the mother. Thus, if the child has difficulty with the task, becomes upset, and requires aid from the mother, the dysregulation coding system would score that child higher on behaviour dysregulation because the child was unable to regulate their arousal without external help. Although the child’s behaviour is never fully independent of maternal influence in these contexts, the express focus of the coding reflects the child’s behaviour regardless of the mother. During the wait task (3 min) the child was presented with an attractive toy and instructed not to touch it until the experimenter returned to the room. The child was left alone for 3 minutes with the toy and scored higher on behaviour dysregulation if he/she touched the toy with a lower latency to first touch, more frequent touches, or engaged in play with the toy.

Measures

Fathering—Naturalistic observations of fathers and children were collected at child ages 4 and 5, using the *Parent-Child Interaction Rating System* (PCIRS; Belsky, Crnic & Gable, 1995). As described above, home ratings of father’s and children’s behaviour were made after each of six 10-min observation periods at age 4 and six 10-min observation periods at age 5. The average rating across all observations was used in analyses. Four ratings of father’s child-directed behaviour at age 4 were used from this coding system: opportunity for interaction, intrusiveness, detachedness, and cognitive stimulation, which were coded on a five point scale ranging from 1 (low) to 5 (high) noticeable presence of the quality. In addition, child scores on sociability at age 5 were used as an outcome. *Opportunity for interaction* was defined as the father remaining within proximity to the child that allowed for visual and/or verbal interaction. *Intrusiveness* was defined as the father imposing his agenda on the child despite signals from the child that a different activity, level, or pace of interaction was needed. Examples of intrusive behaviours included failing to moderate behaviour that the child turns away from, defends against, or expresses negative affect to; offering a continuous barrage of stimulation or toys; not allowing the child to influence the pace or focus of play. *Detachedness* was defined as the father being unaware of the child’s needs for appropriate interaction, disengaging from the child, not reacting contingently to

the child's vocalizations or interactions. *Cognitive stimulation* included behaviours that fostered the child's cognitive development, such as demonstrating a toy/object, describing or labelling a toy/object, focusing child's attention on perceptual qualities of toy/object, verbal responsiveness to child and expanding child's vocalizations, presenting activities in an organized sequence of events, and encouraging the child to actively participate in exploration. *Child sociability* was represented by the degree to which the child initiates social interactions with the parent or any other person and responds to their social initiations; including frequency, intensity, variety of initiations, and responses. The averages of all observation variables across all periods exceeded acceptable levels of reliability using Cronbach's Alpha (opportunity for interaction, $\alpha = .75$; detachedness, $\alpha = .79$, cognitive stimulation $\alpha = .79$, father-child dyadic pleasure, $\alpha = .64$; child sociability $\alpha = .84$) with the exception of intrusiveness ($\alpha = .55$). Parents tend to display fewer instances of intrusive and negative behaviours when they are observed, which would be reflected in a fewer individual 10 minute epoch scores of high intrusiveness, possibly contributing to its lower internal consistency. Given the relative closeness to acceptable levels of reliability ($\alpha = .6$) and the importance of intrusiveness to the creation of the latent variable representing active fathering, the average score of intrusiveness was retained for use.

Child Behaviour Dysregulation—The Dysregulation Coding System was used to assess children's level of emotion and behaviour dysregulation during the laboratory easy puzzle task and wait task at child age 5 and was scored by trained graduate and undergraduate students. This system was designed to capture children's failure to regulate their emotions and behaviours in response to mildly challenging demands. Research and theory has conceptualized emotion regulation in terms of duration, intensity, frequency, and lability of the behaviour or emotion in relation to ongoing contextual demands (Cole, Michel, & Teti, 1994). The dysregulation coding system captures children's emotional and behavioural reactions that are inappropriate to the context through duration, intensity, frequency, and lability. Scores ranged from 0 (no presence of dysregulation) to 4 (high amount of dysregulation present), with each task receiving one global score of emotion dysregulation and one global score of behaviour dysregulation. A child receiving a 0 is typically able to remain on task, following the rules, for the duration of the task regardless of correct completion of the task, whereas a child receiving a 4 is typically a child who shows pervasive outbursts of emotion or behaviour throughout the task, such that the behaviours or emotions are extreme, highly inappropriate, require constant intervention from a parent, and/or occur with enough frequency that the child is virtually unable to regroup or recover from the disruptions. Although the mother was present and able to provide the child with assistance during the easy problem solving task, this system coded only the child's behaviours and expressions, without taking into account the mother's actions. To maintain reliability coding teams needed to meet criteria of 70% exact and 95% within 1 point match of a graduate student master coder. Reliability of the measure at 60 months was good; intraclass correlation coefficients ranged from .88 to .95. Detailed discussion of the dysregulation coding system (with appendix that includes anchor descriptions) can be found in a previous study (Hoffman et al. 2006). The present study uses only scores from behaviour dysregulation during the problem solving task #1 and wait task.

Paternal Control—Fathers' control was assessed using self-reports on the *Control* subscale of the Parental Protectiveness Scale (Thomasgard, Metz, Edelbrock & Shonkoff, 1995) at 48 months of child's age. The Parental Protectiveness Scale is a 25 item self-report scale completed by parents where parents rate each statement on the degree that that statement is descriptive of their behaviour with their child. It is comprised of 4 subscales (Supervision, Control, Dependence, Separation Problems) and a total sum score. The Control subscale has 9 items with content such as, "I determine who my child plays with"

and “I make my child go to sleep at a set time”. Items are rated on a 4 point scale (*Never, Sometimes, Most of the time, Always*). The overall scale has demonstrated adequate internal reliability (Cronback’s $\alpha = .73$) and high test-retest reliability (3-5 weeks; $r = .86, p = .001$; Thomasgard et al., 1995). Fathers’ self-reports on the Control subscale were used in the current study.

Results

Preliminary Analyses

All variables were normally distributed, with the exception of 60-month child behaviour dysregulation during the problem solving task (skew = 3.14, kurtosis = 15.52). In general, children displayed low levels of dysregulation on this task. In order to address the non-normality of this variable, its models were estimated using Maximum Likelihood Robust (MLR), which is robust to non-normal data distributions. Correlations, means and standard deviations are reported in Table 1.

Hypotheses 1, 2, and 3: Activative fathering effects on child dysregulation and sociability

Home observation variables from 48 months were first entered into a confirmatory factor analyses and all loaded well on a single latent factor representing activative fathering (Opportunity for Interaction $\beta = .54, p < .001$; Detachedness $\beta = -.70, p < .001$; Cognitive Stimulation $\beta = .74, p < .001$; Intrusiveness $\beta = .30, p < .01$). The activative fathering latent variable was retained as a predictor in subsequent analyses. Next, the prospective relations between 48-month activative fathering and 60-month child outcomes were examined using Structural equation modelling (SEM) in Mplus, version 5.21 (Muthen & Muthen, 2006). Model fit was assessed using χ^2 , root mean square error of approximation (RMSEA), comparative fit index (CFI) and the standardized root mean squared residual (SRMR). Good model fit is indicated by a non-significant chi-square test, along with cut-off values close to .95 for CFI, .06 for RMSEA, and .08 for SRMR (Hu & Bentler, 1999). First, we examined 48-month activative fathering and 60-month behaviour dysregulation during the problem solving task #1 where the child was asked to complete a block design puzzle (Figure 1). All analyses controlled for SES through the use of a variable that asked fathers their level of education (1=none to 7=Ph.D./M.D./J.D.). Fit indices showed good model fit, and the path from 48-month activative fathering to 60-month child behaviour dysregulation was negative and significant ($\beta = -.29, p < .01$), providing support for hypothesis 1 that activative fathering would be related to lower behaviour dysregulation during the problem solving task. In addition, activative fathering and paternal education were correlated ($r = .49, p < .001$) such that higher educated fathers displayed higher levels of activative fathering.

The second hypothesis that activative fathering would be associated with later lower behaviour dysregulation during a wait task was examined in the same manner (Figure 2). Contrary to our prediction, 48 month activative fathering was associated with later *higher* behaviour dysregulation during the wait task at 60 months ($\beta = .29, p < .05$). Hypothesis 2 was not supported. Model fit was good and the correlation between paternal education and activative fathering remained the same. In addition, for this model higher levels of paternal education was associated with lower behaviour dysregulation during the wait task ($\beta = -.31, p < .01$).

Support was found for the third hypothesis that activative fathering would be associated with higher child sociability (Figure 3). Model fit was good and the path from 48-month activative fathering to 60-month child sociability was positive ($\beta = .29, p < .01$), such that lower activative fathering behaviour was associated with children who displayed higher levels of sociability in the home.

Hypothesis 4: Paternal control as a moderator between activative fathering and child behaviour dysregulation and sociability

We tested our moderation hypothesis that higher levels of paternal control would increase the strength of the relation between activative fathering and child dysregulation during the problem-solving task and wait task, and child sociability. First we split the paternal reports of control on the *Parental Protectiveness Scale* at the median to form two groups of fathers with high and low control. We then ran multiple-group models to test moderation of the path between activative fathering and each outcome. Chi-square difference tests were conducted between a model where all paths were constrained to be equal across high and low control groups and a model where the path from activative fathering to the outcome was free to vary across groups. The resulting chi-square difference test gives a value with 1 degree of freedom, and if significant (values of $\chi^2 > 3.84$ for levels of .05), indicates that the paths significantly differ across groups. Contrary to our expectations, moderation was not apparent for behaviour dysregulation during the wait task ($\chi^2_{\text{diff}} = .09$, $df_{\text{diff}} = 1$, $p = 0.76$) or child sociability ($\chi^2_{\text{diff}} = 2.61$, $df_{\text{diff}} = 1$, $p = 0.11$). The problem solving task model used MLR as an estimator to deal with the non-normal distribution of behaviour dysregulation, consequently a Satorra-Bentler strictly positive scaled chi-square difference test was used to compare constrained and unconstrained models. We followed recommended procedures in Mplus (Bryant & Satorra, in press; Satorra & Bentler, 2010) to compute this test statistic. The resulting chi-square difference test was not significant ($\chi^2_{\text{diff}} = 0.14$, $df_{\text{diff}} = 1$, $p = 0.71$) indicated non-significant moderation for behaviour dysregulation during the problem solving task as well.

Discussion

Results of the present study offer some initial support for father-child activation relationship theory, using home observation assessments rather than the scripted laboratory Risky Situation used by Paquette and Bigras (2010). We attempted to evaluate whether fathering behaviours in the home thought to be associated with father-child activation relationship theory would be related to children's behaviour dysregulation in the laboratory, and children's sociability at home. Father-child activation relationships have been hypothesized to be particularly important for children to develop the ability to regulation their behaviours in arousing and challenging contexts, and thought to improve children's social abilities (Paquette, 2004). Results showed that activative fathering was related to later lower levels of behaviour dysregulation during a problem solving task as well as higher levels of child sociability, confirming theoretical expectations. However, activative fathering was associated with later higher levels of behaviour dysregulation during a wait task, which was opposite than expected. This finding suggests that fathers who engaged in more stimulating interaction had children who were less able to inhibit themselves from touching an attractive toy when verbally prohibited from doing so. We expected that a degree of non-punitive control was necessary on the part of fathers in order for activative fathering to have a positive impact on children's dysregulation and sociability, such that the most optimal outcome for children would be stimulation with limits in place. However, results did not differ for fathers who engaged in high or low levels of control, perhaps suggesting a more complex interplay of father-child characteristics associated with paternal control and child dysregulation than previously thought.

Our findings suggest that activative behaviours on the part of the father appear to be observable during routine father-child interactions in the home. This is noteworthy considering others have used a laboratory paradigm specifically designed to engage the activation system (Paquette & Bigras, 2010), which is likely to be more powerful in detecting effects than general behaviour observations. Possible ecological validity was gained by conducting assessments in family homes, in which more typical father-child

interactions may be likely to occur. A conceptually similar study scored father-child and mother-child interactions and found early challenging and sensitive interactions to be related to attachment in early adolescence for fathers, but not for mothers (Grossmann, et al., 2002). Together, this suggests that the phenomena of father-child activation, at least in terms of parental behaviour, may be more broadly observable rather than limited to the context of RTP. In particular, our findings suggest that activative fathering at home appears to promote children's ability to remain focused when problem solving and increase their social bids and responsiveness to others, which matches theoretical conceptualizations of father-child activation as important to self-regulation and social ability (Paquette, 2004).

In addition, there was a strong association between activative fathering and paternal education across all models, such that fathers with higher levels of education engaged in higher levels of activative behaviour. To the best of our knowledge this has yet to be explored in the literature. That said, father-child activation relationship theory (Paquette, 2004) holds that greater paternal investment in terms of *quality* of parenting can be thought to promote reproductive fitness from an evolutionary biology standpoint. If this is indeed the case, humans are often judged as being successful when they pursue individual competitive achievement in individualistic societies such as the United States. Thus, higher education may be a marker for fathers who have themselves effectively negotiated competition and achieved higher education and social status. It is possible that fathers who had quality activation relationships as children became more adept at competition, self-regulation and achieved higher levels of education, then act in a similar manner with their children to transmit a style of activation relationship across generations that promotes greater survival. Accordingly, this style of activative fathering is likely to differ among individualistic and collectivistic cultures, although this has yet to be explored. However, the present data is *far* from being able to support such conclusions, thus any notion of intergenerational transmission or evolutionary adaptiveness remains speculative.

It is puzzling that activative fathering was associated with higher levels of behaviour dysregulation during a laboratory wait task. In our problem solving task children received higher scores of dysregulation when they were unable to remain focused on the task or evidenced disruptive behaviours, as these were viewed as inappropriate to the context. However, in the wait task, children received higher scores when they touched the prohibited attractive toy sooner, more frequently, or engaged in intense play with the toy as this broke the rules. Thus, we may have captured impulsivity in the wait task. Paquette and Bigras (2010) found no difference between over-activated and activated children on impulsivity (although under-activated and over-activated children did differ), which may mean that we did not capture enough detail in home observations to properly differentiate styles of activative fathering in our sample. Alternatively, finding activative fathering to be associated with children who touch a prohibited toy when not being observed could be interpreted as children engaging in more confident risk taking in an unfamiliar setting. More work is needed to identify the difference between risk taking and impulsivity with respect to father-child activation relationship theory. Given that the rules "not to touch" the toy were delivered to the child via the experimenter in a laboratory context, it would be interesting to see whether children are more obedient during a wait task when the rules are vocalized by a parent.

Finally, we expected that activative fathering would be associated with higher child sociability and lower child dysregulation, particularly when fathers engaged in a higher degree of control. Results, however, suggested that paternal control did not differentiate the impact of activative fathering on behaviour dysregulation or sociability. Optimal father-child activation, according to theory, requires a father to be stimulating and challenging during interactions while also setting limits to ensure safety for the child (Paquette, 2004). A large

body of literature suggests authoritative fathering (conceptually similar to activative fathers who engage in stimulating, fun, playful interactions while setting non-punitive limits) is associated with decreased internalizing and externalizing behaviours in children (Marsiglio, Amato, Day, & Lamb, 2000). Given strong theoretical and empirical backing of moderate control as important for the promotion of child development, we believe that our measure of control may not have captured the appropriate control behaviour by fathers. We asked fathers to report their general level of control with respect to activities such as friends and bedtime routines. Future work that examines paternal control, scored as it is observed during father-child interaction and during specific tasks related to risk taking may better capture the theoretical activation relationship. Additionally, temperament has been implicated as a within-child factor that is associated with activation type (Paquette & Bigras, 2010). It is possible that paternal activative behaviour interacts with child temperament to produce adaptive or maladaptive outcomes for children, such that children with different styles of temperament are better matched with styles of activative fathering. Again, such conclusions are purely cursory given present knowledge.

Limitations

Although our naturalistic observations in the home add to the ecological validity of the findings, there are drawbacks to measuring father-child interaction in this manner. First, father-child activation relationship theory holds rough and tumble play (RTP) as a crucially important domain in which fathers stimulate children while providing appropriate limits. RTP allows children to practice self-regulation while highly aroused, often during physical roughhousing, as well as negotiate transitions between dominant and non-dominant play. Though our home observations may have included RTP, RTP was not specifically targeted for father-child interaction observations. Doing so may provide a stronger test of father-child activation relationship theory, and is an important next step. Also, the kappas for reliability of our home observation coding system were acceptable, but close to .6 so some caution is warranted in interpretation and conclusions would be strengthened if the system was more highly reliable. In addition, this study measured paternal characteristics thought to be associated with the father-child activation relationship, but cannot characterize the type of activation relationship as in Paquette and Bigras (2010). Lastly, mothers were present during the laboratory puzzle solving task. Although our coding system was specifically designed to capture child behaviours independently of maternal influence, children's behaviour for this task was not observed in isolation.

Conclusion and Future Directions—Results from the present study suggest that father-child activation relationship theory holds promise as a conceptual basis for understanding father-child relationships in the context of parent-child attachment relations. Activative fathering behaviour appears to be associated with higher social bids and social responding in children, and children's ability to remain on task when problem solving. However, some inconsistencies emerged in the present study: activative fathering was associated with children who violated rules not to touch an attractive toy, and paternal control was not necessary for activative fathering to positively impact child dysregulation and sociability. It is possible that father's reports on themselves may have been biased by social desirability. At present, work on father-child activation is in its infancy. Future work on father child activation relationship theory would benefit from observations of father-child interaction and paternal control during RTP and risk-taking contexts, improved differentiation of risk-taking from impulsivity, additional validation of the Risky Situation, exploration of intergenerational transmission of activation, and attention to cross-cultural similarities and differences of father-child activation relationships.

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Figure 1. Problem solving task model. $\chi^2(8, N=127) = 12.37, p=.14, CFI=.96, RMSEA=.07, SRMR=.05$. PS = Problem Solving. * = $p<.05$. ** = $p<.01$. *** = $p<.001$.

Figure 2.

Wait task model. $\chi^2(8, N=127) = 10.30, p=.24$, CFI=.97, RMSEA=.05, SRMR=.05. WT = Wait Task. * = $p<.05$. ** = $p<.01$ ***= $p<.001$.

Figure 3. Child sociability model. $\chi^2(8, N=127) = 11.06, p=.19, CFI=.97, RMSEA=.06, SRMR=.05$. * = $p<.05$. ** = $p<.01$ ***= $p<.001$.

Table 1

Means, Standard Deviations, and Intercorrelations for Father and Child Variables.

	1	2	3	4	5	6	7	8	9	10
1 Father Education	--									
2 Opp. For Interaction	.13	--								
3 Detachedness	-.33 ^{***}	-.32 ^{***}	--							
4 Intrusiveness	-.01	.24 ^{**}	-.23 [*]	--						
5 Cog. Stimulation	.44 ^{**}	.38 ^{**}	-.52 ^{***}	.16	--					
6 PS Beh Dysreg	.04	-.17 [†]	.10	-.07	-.14	--				
7 WT Beh Dysreg	-.16 [†]	.03	-.09	.09	.13	.00	--			
8 Child Sociability	.22 [*]	.11	-.25 ^{***}	.03	.23 [*]	-.17 [†]	.02	--		
9 F-C Pleasure	.30 ^{**}	.24 [*]	-.27 ^{***}	-.11	.34 ^{**}	-.24 [*]	-.11	.31 ^{**}	--	
10 Father Control	.13	.09	-.07	-.05	.14	-.03	.13	.03	.11	--
<i>M</i>	4.47	3.48	2.87	1.33	1.47	0.64	0.56	3.26	1.57	1.43
<i>SD</i>	1.79	1.00	1.03	0.34	0.59	1.12	1.13	0.87	0.64	0.50

Note: Ns range from 103 to 122 due to missing data. Opp = Opportunity. Cog = Cognitive. PS = Problem Solving. WT = Wait Task. C = Child. F-C = Father-Child. *M* = Mean. *SD* = Standard Deviation.

* $p < .05$.

** $p < .01$.

† $p < .10$.