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Rough and Tumble Play Quality [RTP-Q]:
Theoretical foundations for a new measure of father-child interaction

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Rough and Tumble Play Quality [RTP-Q]: Theoretical foundations for a new measure of father-child interaction

Abstract

Energetic, competitive, body-contact play (Rough and Tumble Play [RTP]) is commonly observed among young children and is reported as an important feature of father-child relationships. Animal studies have demonstrated positive developmental effects of peer-peer play-wrestling, influencing cognitive and social outcomes. The purpose of this paper is to discuss the nature of rough and tumble play between father and child, its relationship to child development, and to describe a theoretically-informed measure of the quality of father-child rough and tumble play.

Introduction

Rough and tumble play (RTP) behaviours have been observed in many mammalian species (Blomqvist, Mello, & Amundin, 2005; Pellis & Pellis, 2007). While RTP is a complex activity making precise definitions difficult, there is general agreement that RTP, in both animals and humans, refers to ‘vigorous behaviours such as wrestling, grappling, kicking, and tumbling that would appear to be aggressive except for the playful context’ (Pellegrini & Smith, 1998, p. 579). Play behaviour in rats provides one of the clearest illustrations of these behaviours. When fighting, rats target the rump and belly of their opponent but when play-fighting they target only the nape of the neck, clearly signalling the lack of aggressive intent. Rats are also observed to wrestle by pinning one another to the ground and to voluntarily reverse roles so that the dominated opponent can become dominant (Pellis & Pellis, 2007).

Rodent studies have also demonstrated an important developmental role for play-fighting. When juvenile rats are reared so that they are able to touch (through a mesh), hear and smell other juveniles but are prevented from playing together (including play-fighting), they will be unable to recognize social partners, will be more behaviorally rigid, and will

exhibit impaired rule-learning compared to socially reared rats (Bell, McCaffrey, Forgie, Kolb, & Pellis, 2009; Van den Berg et al., 1999). Neurological studies of rats raised without physical play have identified deficiencies in the medial prefrontal cortex, an area of the brain associated with social interaction (Bell et al., 2009).

While comparable neurological studies on play-deprived humans are not currently available, the applicability of animal models to the understanding of human brain function is well accepted, and there is evidence that similar neurological pathways are activated in both animal and human bonding processes (Kentner, Abizaid, & Bielajew, 2010; Maestripieri, 1999; Panksepp, 1993). The purpose of this paper therefore, is to describe the rationale and development of a measure of the quality of RTP in human interactions, specifically between father and child. First, we describe the context of rough and tumble play in humans, and go on to explain two theories that form the foundation for the development of the empirical measure.

Rough and Tumble Play in Humans

Based on the distinguishing features observed in studies of animals, RTP involving children and their peers has been defined as play that involves running, jumping, wrestling, chasing and fleeing, with three important features: there are signs of positive affect; partners reciprocate the roles (e.g., chaser-chased); and social interaction is sustained (Pellegrini, 1989). Studies of US children show that RTP is characteristic of certain stages in children's development. During the preschool years the amount of playtime devoted to RTP is approximately 5%; the rate rises to reach 10% of recess time among 7 to 11 year olds, falling to 5% by 13 years of age (Pellegrini & Smith, 1998). Similar to animal studies of RTP, children's RTP is more typical of boys than girls (Pellegrini & Smith, 1998).

A major difference between human and non-human mammals, however, is the extended period of dependency in human children, and the social complexity of human societies. Sensitive and responsive parent-child play in humans is recognised as a precursor to social competence, cognitive development and secure attachment (Fonagy, Gergely & Target, 2007). Consequently, studies of RTP in humans have diverged from the focus on peer-peer play to include examinations of the nature and effects of young children's play-fighting with their parents. In contrast to the mother-child focus found in most studies of early child development, parent-child RTP has been investigated almost exclusively as part of a father's role (Flanders, Leo, Paquette, Pihl & Séguin, 2009; MacDonald & Parke, 1984; Paquette, Carbonneau, Dubeau, Bigras & Tremblay, 2003). A consistent finding in studies of mothers' and fathers' parenting behaviours is that play comprises a greater proportion of fathers' interaction with children than it does for mothers (Craig, 2006; Lindsey, Mize & Pettit 1997). When mothers' and fathers' play has been compared (in western industrialised countries), fathers' play has frequently been found to be more physical than that of mothers and to more often involve RTP (Carson, Burks & Parke, 1993; Labrell 1994; MacDonald & Parke 1986; Paquette et al., 2003).

The theoretical basis of human rough and tumble play

Two theoretical formulations have framed the investigation of peer-peer and father-child RTP in humans to date. One is based on the role of dominance in play, and its consequences for child development. The concept of dominance, 'an individual's ability to defeat a conspecific¹, often using aggression, in a contest for resources' (Pellegrini et al., 2007, p. 54) is central to ethological studies of animal play-fighting. Observational studies among mammals describe juvenile play-fighting as leading to the establishment of a

¹ Conspecific means an individual of the same species.

dominance hierarchy where subordinate individuals learn to recognize dominant individuals' behavioural cues and so avoid conflict (Pellis & Pellis, 2007). According to evolutionary theory, the establishment of a dominance hierarchy avoids unnecessary combat with attendant risk of injury and selects males with the highest likelihood of reproductive success, since dominant males gain preferential access to females and resources.

Establishing dominance among peers and between fathers and children has also been an important construct in formulations of RTP among humans (Flanders et al., 2009; Pellegrini, 1995). Observation studies of preschool and school-age children at play however have identified different functions for RTP according to the ages of the children involved. For preschoolers and young children, RTP among peers is marked by affiliative rather than aggressive characteristics and RTP does not seem to establish dominance. For example, engaging in RTP does not correlate with students' peer-rated 'toughness' (Humphreys & Smith, 1987; Pellegrini, 1995; Pellegrini & Smith, 1998). In these age groups, RTP among peers is recognised as contributing to children's social skill development and ability to work together in groups (Pellegrini, 2009). Dominance is considered important however, for adolescents' play-fighting (at least among boys) (Pellegrini, 1995). However, since the children most likely to play-wrestle with their fathers are in the younger age groups, concepts of dominance taken from evolutionary theory are unlikely to prove adequate to frame judgements of quality RTP in father-child relationships.

A second major formulation arising from investigations of father-child playful wrestling has been that father-child RTP influences young children's development of self-regulation by allowing children to practice managing affectively arousing stimulation and develop regulation of aggressive impulses (Parke et al., 1989; Peterson & Flanders, 2005). The period of children's engagement in RTP with fathers, commencing in toddlerhood and increasing

through the early years of schooling, is one of rapid development in children's ability to coordinate their bodily movements and to manage their emotions. The arousing, physically challenging, competitive play that occurs when young children play-wrestle with their fathers has been proposed as a valuable opportunity for children to practice interpreting others' emotions, managing their own strong impulses (e.g., biting), and coping with failure or frustration (Carson et al., 1993; Peterson & Flanders, 2005). The development of generic social skills such as the ability to decode others' emotional valence and expressing appropriate emotions have also been attributed to RTP between fathers and their young children (Carson et al., 1993). While at this stage empirical support for this formulation is meager, the conceptual linking of father-child physically challenging play and self-regulation aligns with the widely accepted attachment paradigm of human development that accords parent-child interaction a central place in the growth of cognitive and social competence. The recognition that father-child interactions may differ in important ways from typical mother-child interactions is also consistent with recent studies that seek to broaden the measure of attachment to include not only safety and nurturance but also challenge and exploration.

Grossman and colleagues (Grossman & Grossman, 2000; Grossman et al., 2002), for example, have argued that the prevailing emphasis on parent-infant attachment as a place of physical and emotional safety in the face of perceived threat ignores the importance of building the infant's confidence to explore their environment. The accepted measures of attachment security, these researchers point out, define the attachment relationship narrowly – as activated only in cases of perceived loss. In pursuit of a more balanced measure of secure attachment, they propose an additional measure of the parent-child relationship, one that is also based on the original tenets of attachment theory that emphasised sensitive and responsive parent-child interaction (Ainsworth & Bowlby, 1991). Emphasising support for

children's exploration, the Sensitive and Challenging Interactive Play Scale (SCIP Scale) (Grossman & Kassubek, 1999; Grossman et al., 2002) is proposed as a measure of parent-child play that assesses how parents can challenge as well as support children's developing competence through exploratory play. Higher ratings on the SCIP scale are awarded to parents who challenge the child to play in more mature ways, who motivate the child, and who make suggestions that are usually accepted by the toddler. In a 16-year longitudinal study of German families, fathers' sensitive and challenging play was the strongest predictor of children's attachment status as adolescents/teenagers: high scoring father-child play at two years predicted children who were more comfortable with uncertainties and complexities, were less likely to seek reassurance from others and less likely to withdraw in the face of frustration and adversity (Grossman, Grossman & Zimmerman, 1999).

Based on research with Canadian families, Paquette (2004) has also sought to extend the exploration side of the secure attachment concept. He proposes that infants develop their attachment bonds to fathers through play, especially the physical 'rough' play preferred by fathers. Linking the evidence from primate studies of the importance of assessing and maintaining dominance among males, he stresses the fathers' dominant role in physical play with his child. During 'quality RTP' a father is able to "communicate a double message to his child: 'I love you' (affective component) and 'I am stronger than you' (agonistic component)" (p. 208). Conveying both messages entails being sensitive to the child's emotional state while permitting "a reciprocal exchange of 'dominant' and 'subordinate' roles, (i.e. regularly allow the child the pleasure of being on top" while making it clear that "the father is still stronger than the child", p. 209). A study utilizing these concepts assessed the development of aggression and self-regulation in preschool children (Flanders et al., 2010). Father-child RTP was categorised by awarding fathers a dominance score reflecting

the degree to which the father was submissive, sharing, or in charge. Children's physical aggression and self-regulation was measured five years later by fathers' report. Higher levels of aggression and lower levels of self-regulation were found among those children who more frequently engaged in RTP with their fathers but only when their fathers were less dominant in the RTP (Flanders et al., 2010).

Both the measure of sensitive and challenging play in the SCIP scale and the proposed measure of 'I love you and I am stronger than you' (Paquette, 2004) have much to offer when assessing the quality of RTP. However, a wider scope is called for. The SCIP scale examines sedentary activities only, so that fathers' physical play is outside its remit. The measures of 'quality' RTP suggested by Flanders et al., (2009) and Paquette (2004) emphasise 'dominance' and use frequency counts of behaviours, and thus miss the important emotional valence and synchronicity of responsive and sensitive interaction. What is required is conceptual refinement and a robust measure of the energetic, playful, competitive aspects of RTP that take account of the emotional tone of the interaction and the level of synchrony between the father and child.

The Nature and Quality of Father-Child Rough and Tumble

To extend the definition of rough and tumble play given by Pellegrini and Smith (1998), we argue that assessments of father-child rough and tumble play should take account of several dimensions of father-child interaction, some of which have been addressed in previous research, others not yet considered. In high quality RTP, the father is attentive and playful, and he communicates enjoyment at the competition between the two of them. He is attuned to the child's abilities and interests and can motivate the child to re-engage. The father succeeds in keeping a good balance between actively challenging the child on the one hand and 'letting the child win' on the other. The interaction shows that they are used to playing with each

other in a way that lets the child know that he/she can trust the father to manage the aggression between them and to enjoy the child's attempts to win. In this formulation of rough and tumble play therefore, we propose that the nature and quality of RTP aligns conceptually with a number of fundamental constructs that characterise parent-child interactions, such as parenting warmth, sensitivity and control, as well as having other specific dimensions, such as reciprocity of dominance, challenge and playfulness.

Warmth, sensitivity, and control are key dimensions of parenting styles associated with children's positive socio-emotional and cognitive development (Baumrind, 1966; Roggman, 2004). Warmth in RTP has been assessed by the quality of laughter observed in the interaction and by self-report and by negative intensity (MacDonald, 1987). A lack of negative parenting behaviours, such as hostility, rejection or irritability (Grossman et al., 2002), or the absence of child's crying or anger (Paquette et al., 2003), would also be indicative of high quality interactions. Sensitivity or attunement to the child, where the parent accurately reads their children's needs and responds contingently to these cues, is also significant in positive parent-child interactions (Ainsworth & Bowlby, 1991). Parenting control is conceived of as firm discipline, where a parent sets developmentally appropriate limits and expectations for their children's behaviour (Baumrind 1966). Fathers' level of control in play has been coded in some previous observation studies of RTP. However, in line with the evolutionary perspective, the notion of control has been cast in terms of dominance, so that a father-child interaction where the father is clearly dominant is scored as high quality RTP. In Flanders et al. (2009), fathers' physical dominance of the child by pinning down or directing the flow of play received a high score while a child's suggestion, 'Daddy, it's my turn to tickle you'' received a low score if followed. More directive communications from the

father (e.g., ‘Johnny, run over here and tackle me!’) were also scored more highly than requests (e.g., ‘Do you want to play horsey?’).

In our formulation, the concept of dominance is expected to figure in the father-child interaction in relation to the winning and losing of the game. Opportunities to win or lose will be given by the father who by virtue of his size at least, can dominate the child in physical encounters. But for the child, part of the enjoyment of rough and tumble is winning and losing. Winning is important because for developing children, the chance to achieve mastery over a foe superior in age, strength and status, while being loved, is an exhilarating experience. Therefore, sustained dominance by the father of the child is not a marker of high quality RTP. We have taken as the high point of RTP the father’s acting to create a balance of winning and losing that is attuned to his child’s needs.

In a similar vein, parents’ responsibility when challenging children to explore their world is to scaffold their experiences such that stimulation is kept at an optimal range, neither too easy or safe, nor too difficult or risky (Parke et al., 1989; Paquette, 2004). In the father-child rough and tumble context, this risk is considered to be part of the challenge or stimulation that fathers offer their children (Parke, 1996). For children, risk-taking encompasses both a sense of exhilaration and of fear, and is a phenomenon that many children seek in their play activities (Sandseter, 2009). While parents’ and educators’ views on risk taking in children’s play are often ambivalent (Little & Wyver, 2008), children’s risk-taking, when carefully managed and scaffolded, has been shown to develop confidence, self-esteem and resilience (Play Safety Forum, 2002; Wyver et al., 2010).

Another essential component of rough and tumble is its playfulness; this may be measured as fun (Flanders et al., 2009), or animation and expressiveness (Chiarello, Huntington & Bundy, 2006; Mills-Koonce et al., 2010). The intensity of the physical

engagement between father and child in vigorous rough and tumble play would also be an indicator of how involved the father and child are with each other in the play (Flanders et al., 2009).

The Development of a Measure of RTPQ

Fathers and their young children typically engage in RTP in the privacy of their home, as part of a range of interactive activities. The informal nature of RTP means that each RTP occurrence may vary along a number of parameters, such as frequency, length, type or quality. Researchers generally choose to measure frequency. To establish the frequency of father-child RTP, fathers have been asked ‘How often do you play fight with your child?’ (e.g., Flanders et al., 2009). The frequency of various types of play is also measured, such as swinging the child, rolling on a soft surface, wrestling, tumbling, playing horsey or holding and cuddling (e.g., Macdonald & Parke, 1986). However, estimates of RTP frequency are widely divergent and rely on participants’ understanding of ‘play-fighting’ or ‘playing horsey’, as well as the usual difficulties of recall and possible social desirability bias in self-report measures. Self-report measures can vary in unpredictable ways (Prince et al., 2008), and while direct observation is costly and may itself attract problems of participant reactivity, it has been shown to deliver valid results with respect to parenting behaviours (Arney, 2004).

Our development of an observational measure of rough and tumble play quality (RTP-Q) took as a starting point the SCIP scale (Grossman et al., 2002), which assesses father-child interaction during a sedentary play task by observing the occurrence of appropriate, sensitive, reciprocal interaction (safe base behaviour) found in standard attachment measures, and fathers’ challenge to the child to sustain their effort in solving a task. The RTP-Q measure was further developed by constructing items related to the dimensions discussed above: warmth, control, sensitivity, winning and losing, physical engagement, and playfulness,

captured both as individual and dyadic behaviours. Five global narrative descriptions were developed to describe the quality of interactions and behaviour of father and child (from poor to excellent, see brief descriptions in Appendix 1).

The behaviours at each of the five levels of RTP quality were operationalised to form a 16-item scale, and the specific rating level within each item (using 5-point Likert scales). The items capture individual and dyadic affective states and behaviour of father and child, including verbal and non-verbal behaviours. These were assessed for frequency and/or intensity; ratings increased as a function of frequency and intensity (see Table 1 for an example). We used overall judgements about the presence of the behaviours, or ‘global ratings’ (e.g. Grossman et al., 2002; Roggman, Boyce, & Newland, 2000), because we were interested not so much in specific behaviours (micro-level analysis), but clusters of behaviours that together shaped the quality of the father-child interaction during the games. The theoretical concepts and empirical evidence discussed above, along with expert review and team discussion, were utilised to define the construct parameters, to operationalise these into rating anchor descriptors, and to detail coding decisions, exemplars and non-exemplars of the coding schema.

Table 1 about here

Initial development of the RTP-Q

The preliminary coding schema was pilot-tested/trialled using a set of games designed for father-child physical interaction, applied in a fathers’ weight-loss group setting (Morgan et al., 2010). The fathers and children (ages 5-12 years) were videotaped undertaking a number of rough and tumble games including Arm-Pull, Get-Up and Sock Wrestle. In Arm-Pull, children and fathers hold one another’s arms, and while hopping on one leg, attempt to pull the other towards them. In the Get-Up game, fathers are instructed to lie on their back and at

the word “go” from the group leader to try to stand up, while the children try to hold their father down. Sock Wrestle is played with father and child on their hands and knees. Each tries to get the other’s socks off without losing their own.

Two researchers coded the rough and tumble games of Arm-Pull, Get-Up and Sock Wrestle. In order to refine the scale and train the coders, the videos were viewed and discussions held on each item and each rating descriptor until consensus was achieved. These decisions took approximately 60 hours over 8 weeks. Since the semi-structured measurement context offered several play sessions for observation (between 1 and 3 games per dyad), the mean of the observations was taken as the most representative total score for the quality of each father’s RTP (Yoder & Symons, 2010). The analysis, using the average of the two coders’ total scores to obtain fathers’ final scores, demonstrated an acceptable range of scores (range of Means, 53.2 - 90.5) and high consistency between two raters (Intraclass correlation coefficient, 0.96).

Following this preliminary development, the items of the scale were reviewed to ensure that all items were applicable to children of preschool age (4 years) and a pilot study was undertaken to assess the correlation between RTP-Q score for father-child dyads and the child’s emotional and behavioural development as measured by the Strengths and Difficulties Questionnaire (SDQ; Goodman, 2001).

The Pilot Study

Participants, Measures and Procedure

A total of 26 two-parent families were recruited to participate in the pilot study. Fathers ranged in age from 32-46 years ($M=37.4$, $SD=3.7$) and the majority were in fulltime employment ($N=25$, 96%). Mothers ranged in age from 30-45 years ($M=36.5$, $SD=4.0$) and

most were employed on a casual or more frequent basis (N=21, 81%). Children ranged in age from 42-56 months (M=51, SD=3) and there were more boys (N=18, 69%) than girls in this sample.

Father Involvement

A measure of the father's involvement with the study child was obtained using the 6-item Parent Involvement Scale that has been used extensively in the *Longitudinal Study of Australian Children* (LSAC; see Sanson et al., 2002). Fathers self-rated the frequency with which they performed caregiving tasks for their child (e.g., bathing, putting them to bed) on a 5-point scale ranging from Daily to Not At All (Cronbach's $\alpha = 0.695$).

Rough and Tumble Play Quality

Two researchers visited the families at their home. Father and child were asked to play two rough and tumble games: Get-Up and Sock Wrestle. These were played within the confines of a largish square rug. A small camcorder was mounted on a tripod and situated approximately 3 meters from the rug. A researcher instructed the father and child in the procedure of the two games, and after turning on the camera, left the room.

Two independent coders rated the interactions using the RTP-Q scale. Interrater reliability scores were high ($ICC=.81$). Scores were then averaged for each dyad and across coders to give an overall level of RTP quality. Cronbach's alpha was calculated to determine the reliability of the RTP-Q scale and was found to be very high ($\alpha=.95$). Fathers were also asked whether the Get Up and Sock Wrestle play interaction was more or less similar to their usual interaction. Fathers indicated that there were no major differences between the videoed and regular play with this child.

Child Outcomes

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 2001) gives an indication of a child's emotional and behavioural functioning. The SDQ is a widely used and validated screening questionnaire with reasonable internal consistency (Cronbach's $\alpha = .73$), and retest stability (Intraclass Correlation = .85; Goodman, 1999). The SDQ consists of 25 questions, divided into five subscales (hyperactivity, emotional problems, conduct problems, peer problems, and a prosocial score). The first four subscale scores can be combined to give a total difficulties score. SDQ difficulties scores above the 90th percentile indicate problem behaviours and are associated with a substantially increased risk of developing a psychiatric disorder (Goodman, 2001). Both mothers and fathers completed the SDQ in this study.

Analysis Plan

Correlations were conducted to test the association of RTP-Q and children's SDQ scores, as rated by mothers and fathers. We used linear regression analysis to determine the relationship between fathers' RTP-Q and mother-reported child SDQ Total Problems scores while controlling for father involvement.

Results

Correlations were performed between fathers' RTP-Q score and mother and father reported SDQ scores. Results can be seen in Table 2. RTP-Q was significantly negatively correlated with paternal reports of SDQ Conduct, Peer, and Total Problems scores and with maternal reports of SDQ Emotional and Total Problems scores. These correlations ranged from medium ($r = -.44$) to large ($r = -.60$; Cohen, 1992). There was also a medium sized positive correlation between RTP-Q and father's report of their parenting involvement ($r = .41$, $p = .04$).

Table 2 about here

Linear regression analyses were conducted to examine the effects of RTP-Q and father involvement on mother-reported child SDQ Total Problems scores. Because our focus is on the relationship between father-child RTP-Q scores and child problem behaviours, we chose to use mother-reported child SDQ Total Problems scores to avoid any bias in reporting of behaviours. As seen in Table 3, RTP-Q was found to be a significant predictor of child SDQ Total Problems scores, with increasing RTP-Q scores being predictive of lower problems scores.

Table 3 about here

Discussion and Conclusions

This pilot study adds to the growing evidence of the relationship between father-child interactions and child behaviour. The quality of the physical, competitive play between these fathers and their four year old sons and daughters was associated with problem behaviours as measured by a standard parent report instrument. Specifically, and as expected, RTP-Q score was significantly, negatively correlated with father reports of SDQ Conduct and Peer Problems, with mother reports of Emotional Problems, and with both mother and father reported Total Problems scores. As the regression model shows, RTP-Q score was a significant predictor of problem behaviours over and above the level of father involvement. Rough and tumble appears to have an important connection with the developmental trajectory of children's psychology, and further research is required to tease out its key dimensions.

While accurate measurement of the frequency of father-child RTP may have to await suitably crafted time-use diary studies, direct observation such as employed here may provide a useful measure of the quality of father-child RTP. For the assessment of both frequency and quality however, a first important task is to clarify the theoretical and conceptual basis of the

physical play between fathers and young children. In this paper, we have focused on the theoretical foundations applying to rough and tumble play quality, in order to develop a measure that will facilitate investigations into the processes and contexts of paternal influences on children's development. The development of any new measure depends on both theoretical and empirical knowledge and this observational rating scale draws on ethological and evolutionary theories, including attachment theory, as well as the limited amount of father-child interaction research, to accomplish the first steps of defining and operationalizing the construct of RTP-Q. While there have been several instruments used over time to measure father-child interaction, each of these have focused on different aspects of interaction, for example dominance in play (Flanders et al., 2009), frequency of interaction (Lamb et al., 1982), play style in general play (Keren, Feldman, Namdari-Weinbaum, Spitzer & Tyano, 2005), rather than only physical, non-object mediated play.

Future research into parenting effects of RTP may include careful documentation of how frequently fathers and mothers engage in these behaviours, as well as assessing similarity between mother and father physical play interactions with the child and the demographic characteristics of the family. Validation studies matching the RTP-Q scale with other constructs will also be important. For example, we would hypothesise that there would be correlations, and thus convergent validity, with parenting styles, such as those measured in Wake, Nicholson, Hardy & Smith (2007), as well as play quality, for example, that measured by the play quality scale in Kerns and Barth (1995). We would also expect to find that RTP-Q scores align with the father's Risky Situation Score (Paquette & Bigras, 2010). Despite evidence suggesting that the links between RTP and aggression may be unfounded, this remains a highly debated area of study and for this reason, aggression should be considered when designing RTP measurements. Hypothetically, a comparison between aggression and

RTP quality would achieve divergent validity and thus show that RTP is in fact a distinct behavioural construct.

The study of interactions between fathers and their young children is important as fathers are increasingly recognised as influential in children's cognitive, social and emotional development (Flouri 2010; NICHD Early Child Care Research Network, 2004). As well, the costs to the community and to the individual of maladaptive development during the early years have directed attention to the ways in which parents can build resilience in their preschoolers (Gray & McCormick, 2005). Fathers' play, which is a key characteristic of father-child interaction, is therefore an important area to examine. The evidence from animal studies further suggests that RTP may be especially important for the growth of social and behavioural skills that will be important for success in later life. To date, however, father-child RTP has received limited attention in the child development research. With increasing attention to paternal influences within families, the development of robust measures will aid investigations of key factors for improving children's outcomes. The pilot RTP-Q scale described here was developed from theoretical concepts, empirical evidence, and expert review; it can be reliably coded and demonstrates good internal consistency; thus, it may be a useful measure for investigating fathers' influence on child development.

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Appendix 1. Global Descriptors (in brief) of RTPQ

5) RTP Excellent

The father is attentive and playful, exuding a confident expectation that the dyad will enjoy their time together. The father is able to communicate the tone of enjoyment at the competition between the two of them. He manages the level of physical exertion for both himself and the child effectively because he is tuned to the child's abilities and interests. His Initiations or challenges within the competition are frequently successful, eliciting further enjoyment and effort from the child.

4) RTP Very good

The father is attentive and playful although the balance between the two of them doesn't work as well. There is either a tendency for the father to sometimes challenge at a level that is too difficult or too easy for child to manage so the competitions don't always go successfully. The child might be hurt occasionally or the father may need to forcefully stop the child getting 'out of control'.

3) RTP Good

The father is playful and an active member of the dyad. Some of his initiated communication is accepted and works to challenge the child to explore new social experiences. However, an equal number of initiations are not successful. There is almost a balance between optimal physical exchanges and exchanges where the energy dissipates or where the game gets out of control.

2) RTP Fair

The father shows limited sensitivity. Many challenges are unsuccessful. Much of the play is initiated by the father in a way that doesn't seem to connect with how the child is ready to play. The father initiates play but doesn't know how to respond when the child does not engage with enthusiasm.

1) RTP Poor

Almost all competitive interaction is serious and uncomfortable. The child gives signals of not being willing to join in the spirit of the game and really try. Embarrassment or distrust is too great to enjoy the activity. The child doesn't know how hard he/she can play so uses low energy bids to win the encounter.

Table 1. Examples of RTP descriptor, item and scale anchors

<i>RTP Global description</i>	<i>Operational item</i>	<i>Rating Anchor 1</i>	<i>Rating Anchor 5</i>
The father is attentive and playful, exuding a confident expectation that the dyad will enjoy their time together. The father is able to communicate the tone of enjoyment at the competition between the two of them.	Father good-natured acceptance at losing/or loss/or child gains/successful moves.	Father expresses annoyance, resignation, resentment at loss of game.	Father is highly affirming, acknowledges, pleased at child's wins; no negative reaction; no evidence of father ego; encourages child to reengage.

Table 2. Correlations between Fathers' RTP-Q scores and each of the maternal and paternal SDQ scores.

SDQ	Fathers	Mothers
Emotional Problems	$r = -.21, p = .29$	$r = -.43, p = .03^*$
Conduct Problems	$r = -.44, p = .03^*$	$r = -.30, p = .14$
Hyperactivity Problems	$r = -.26, p = .21$	$r = -.23, p = .27$
Peer Problems	$r = -.60, p < .01^*$	$r = -.21, p = .32$
Prosocial Behaviour	$r = .19, p = .35$	$r = -.07, p = .76$
Total Problems	$r = -.51, p < .01^*$	$r = -.50, p = .01^*$

Note that overall reliability for paternal (Cronbach's $\alpha = 0.78$) and maternal (Cronbach's $\alpha = 0.66$) SDQ reports were similar to those reported by Goodman (1999). $^*p < .05$.

Table 3. Regression model for predicting maternal reports of child SDQ Total Problems

	<i>B</i>	<i>SE(B)</i>	<i>β</i>
<i>Constant</i>	29.90	13.21	
Father Involvement	1.99	2.70	0.17
RTP-Q	-7.10**	2.25	-0.73
<i>R²</i>	.50		
<i>F</i>	4.94*		
<i>df</i>	(2,12)		

Note. * $p < .05$. ** $p < .01$