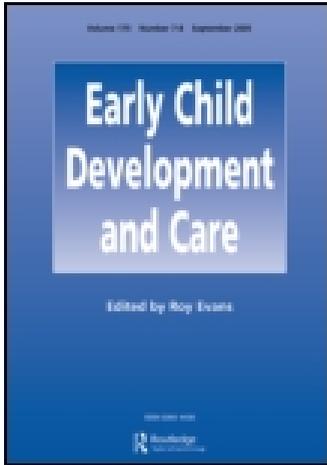


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The risky situation: a procedure for assessing the father-child activation relationship

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The risky situation: a procedure for assessing the father–child activation relationship

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Initial validation data are presented for the Risky Situation (RS), a 20-minute observational procedure designed to assess the father–child activation relationship with children aged 12–18 months. The coding grid, which is simple and easy to use, allows parent–child dyads to be classified into three categories and provides an activation score. By having the same parent–child dyads participate in the Strange Situation (SS) and in the RS, researchers were able to demonstrate that the RS appears to evoke specific relationship patterns. Moreover, parental stimulation of risk-taking, the central construct of the RS, was shown to play a significant role after controlling for child characteristics (sex and temperament). These results suggested that the RS has the potential to make a significant contribution to the study of the human relationship.

Keywords: activation relationship; attachment; evolutionary developmental psychology; fathering; sex differences; temperament

Paquette (2004a, 2004b) recently theorised the father–child attachment by developing the concept of the “activation relationship”, that is the affective bond that allows children to open up to the outside world (see Le Camus, 2000), focusing primarily on parental behaviour during child exploration, especially parental stimulation and control (see Paquette, Bolté, Turcotte, Dubeau, & Bouchard, 2000). According to this theory, children’s feelings of confidence would result not only from the sensitive response of the parent to the child’s comfort-seeking in times of distress, but also from the encouragement offered by parents during exploration of the environment. The activation relationship fosters children’s confidence in their own abilities to cope with threats and strangeness in their physical and social environments, as their fathers encourage them to push their exploration further while at the same time providing them with the confidence of knowing they are protected from possible danger, hence the importance of discipline. The activation relationship theory predicts that fathers will activate children more than mothers will, and that boys will be activated more than girls. Finally, like the attachment relationship (Bowlby, 1969), the activation relationship would be the result both of children’s temperament and of parental behaviours, particularly parental stimulation of risk-taking. Validation data are presented

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here for the *Risky Situation* (RS), a new procedure for assessing the activation relationship in children aged 12–18 months (Paquette & Bigras, 2005).

According to John Bowlby (1969), attachment theory consists of two opposing, complementary behaviour systems: (1) the proximity behaviour system that ensures the child's protection, and (2) the exploration system that fosters the child's acquisition of knowledge and adaptation to unfamiliar environments. Children regularly seek contact with attachment figures when tired, hungry, sick or afraid or when feeling insecure in the presence of novelty, and this comfort provides them with the necessary confidence to explore their environment further. Again according to Bowlby (1969), children generally develop this secure attachment base with their mother, that is the person who provides them with daily care and who comforts them in times of distress. The father generally remains a secondary attachment figure, unless he is the primary caregiver (Ainsworth, 1967; Bowlby, 1969). When children's basic needs are satisfied and they know where their attachment figures are, they seek out a playmate in their environment (Bowlby, 1969). For Bowlby (1969), the time a father spends playing with a child does not constitute the basis for the development of an attachment relationship: a playmate does not become a source of comfort in times of distress.

The secondary role attributed to fathers in attachment theory is not surprising given that Bowlby drew the inspiration for his work from research on sexually promiscuous primate species (rhesus monkeys, baboons, etc.) in which the young are raised by their mothers. In monogamous primate species (siamangs, titis, etc.), fathers provide intensive parental care (Mehlman, 1988). However, the human species differs from both monogamous and promiscuous primate species in that while fathers may give very little or no direct basic care to children (Hewlett, 2000), they do adopt parental roles that are distinct from those of the mother (Le Camus, 2000). Human fathers play, at minimum, a role of provider of resources and protection for their spouses and children and, depending on the culture, assume various parental responsibilities, generally with boys at the end of childhood (Paquette, 2004a). This parental specialisation may have occurred phylogenetically with the emergence of the sexual division of labour (hunting for men and gathering for women¹), fostered, on the one hand, by the extremely high demands of the human infant due to its immature status and, on the other, by the growing complexity of the human societies to which the offspring must adapt.

According to Le Camus (2000), paternal roles can be grouped together under the function of opening children to the outside world. Fathers act as catalysts for risk-taking, inciting children to use initiative in unfamiliar situations, to explore, take chances, overcome obstacles, be braver in the presence of strangers, and stand up for themselves (Paquette, 2004a, 2004b; Paquette, Eugène, Dubeau, & Gagnon, 2009). Research has amply highlighted the importance of maternal stimulation (encouragement) and guidance (supervision, discipline) in toddler exploration of the environment (Edwards, 1995). The data also suggests that, like fathers, mothers also have a greater tendency to encourage risk-taking in boys than in girls (Morrongiello & Dawber, 1999, 2000). However, a study by Fagot, Kronsberg and MacGregor (1985) shows that fathers are less likely than mothers to intervene and stop children during risky activities although parents of both sexes use the same barometers to assess risk. The greater tendency of fathers towards risk-taking is also reflected in the fact that they engage more frequently than mothers in vigorous physical play with their children, especially boys (Paquette, 2004c). According to Yogman (1994), infants are predisposed to seek a balance between calm and stimulation. Just as they signal in order to

maintain proximity and to receive care and comfort from adults, children also seek high-intensity stimulation, signalling both men and women to provide them with this type of stimulation in stress-free contexts. However, it is generally men who provide them with such stimulation.

Due to the great plasticity of human behaviour, we are currently witnessing increased paternal involvement in Western industrialised societies, especially in middle socio-economic families: fathers are more involved in caregiving than before, with younger and younger children, and progressively more with girls, even in rough and tumble play (Dumont & Paquette, 2008; Paquette, 2005; Paquette, Carbonneau, Dubeau, Bigras, & Tremblay, 2003). While fathers involved in caregiving become increasingly important sources of comfort for their children, studies show that such fathers continue to engage in vigorous, physical play with their children (Dumont & Paquette, 2008). Bowlby (1969) may have been right in saying that the two roles (caregiving and play) are not incompatible. However, some studies have shown that contrasts and complementarity between the two parents provide a wealth of potential learning opportunities for the child, especially in an increasingly complex environment (Gagnon & Paquette, 2009; Paquette, 2005). Dumont and Paquette (2008) suggest that studying paternal involvement in conjunction with the father-child attachment may help us better understand how attachment to the father develops and better predict child development.

The *strange situation procedure* (SS) developed by Ainsworth, Blehar, Waters and Wall (1978) has made it possible to assess the quality of the attachment relationship children ages 12–18 months have with their primary caregiver, generally their mother. The procedure, which was validated with mothers, has also been used with fathers. The low stability, low transmissibility and low predictability of the father-child attachment have led more and more researchers to question the pertinence of using this procedure with fathers who have little involvement in daily caregiving (Suess, Grossmann, & Sroufe, 1992; van IJzendoorn, 1995; Youngblade, Park, & Belsky, 1993). According to Grossmann and Grossmann (1998; Grossmann, Grossmann, Kindler, & Zimmermann, 2008), it would appear necessary to use a method other than the SS to assess the quality of father-child attachment. In their study, the father-child play situation was a better predictor of attachment 14 years later than the father-child SS (Grossmann et al., 2002).

According to the early work of Ainsworth and Wittig (1969) and that of her more recent followers (e.g. Crittenden, 1992; de Wolff & van IJzendoorn, 1997; Pederson et al. 1990), the attachment-exploratory balance in infancy observed during the SS is due, at least in part, to the everyday manifestation of parental sensitivity defined as the amount and quality of emotional support, positive attitude, synchrony, mutuality and stimulation. Intriguingly, this definition focuses more on the secure-based provision rather than on responding to the baby's need for stimulation in exploratory contexts. It seems that the exploration pole of the attachment-exploratory balance is conceptualised as an epiphenomenon or a consequence of the attachment system. In their meta-analysis, de Wolff and van IJzendoorn (1997) found that maternal sensitivity, as originally defined, is likely to be related to SS during infancy (effect size .24), while studies on maternal exploratory stimulation (namely "support" as defined by Matas, Arend and Sroufe, 1978) have demonstrated much weaker links to patterns of attachment (.16). The stimulation of infant exploration may be part of assessment and intervention procedures, but it is conceived of as occurring: (1) in a calm setting in which the baby is comforted or unstressed, (2) in a scaffolding manner where appropriate

parental stimulation follows the baby's lead in order to avoid provoking frustration, and (3) as being often oriented toward cognitive development such as the learning of objects' characteristics and fine motor skills, such as block building (for review see Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2008; Juffer, van IJzendoorn, & Bakermans-Kranenburg, 2008).

The authors propose that the RS is better suited to providing an understanding of father-child attachment than the SS. The activation relationship as assessed using the RS involves a dimension of attachment (in the broad sense of the word) that concerns parental stimulation of risk-taking during child exploration. The attachment relationship and the activation relationship stimulate child exploration of physical and social environments in their own way while ensuring the child's protection. Thus, all parents, whether fathers or mothers, would establish with their children a unique balance between these two types of relationships. The initial validation stage of the RS is the result of three independent studies. The objective of the first study involving a sample of father-child dyads was to test the six episodes and the guidelines given to parents to make it possible to categorise the three types of activation predicted by the activation relationship theory. It also explored the associations between the activation relationship and child characteristics (sex and temperament). The objective of the second study, involving a sample composed of mother-child dyads, was to verify the orthogonality between SS and RS classifications. It was logical to begin with the mothers as the SS had been validated with mothers and not fathers. If most of the secure children were also activated, this would mean the RS was essentially a different procedure for assessing the same construct. Another objective was to verify whether the SS and the RS were associated with different dimensions of child temperament. The final objective was to verify the hypothesis of a positive association between the activation relationship and parental discipline and parental stimulation of risk-taking, especially with boys. The third study shared the same objectives as the second study, but applied to a sample of father-child dyads. Finally, the intention with regard to the total sample was to use it to verify whether parental stimulation of risk-taking explained activation after child sex and temperament were taken into account, whether parental behaviour during the RS was related to the classification, and finally whether activation was related to disorganised attachment as evaluated with the SS.

Method

Procedure

Families were recruited through regularly placed ads in several neighbourhood newspapers in the city of Montreal. Parents were then contacted by phone to set up a first appointment at the University of Montreal. After having the parents sign a consent form, a team of student assistants (two to three) made a video recording of one of the two observational procedures. The parents then completed questionnaires while an assistant played with the child in the same room. Finally, a second appointment was made one month later for the other observational procedure. The procedures (the SS and the RS) were conducted in two different rooms, both equipped with three hidden cameras.

Subjects

Table 1 presents the sociodemographic characteristics of the three samples used in the study. The first sample comprised 21 father-child dyads with 10 boys and 11 girls.

The second comprised 22 mother–child dyads, with 13 boys and nine girls. The difference in age for the two procedures in this sample is explained by the fact that the SS was carried out approximately one month after the RS due to concern that the SS, being more anxiety-producing due to the parent–child separations, might influence the RS more than the reverse. The third sample comprised 21 father–child dyads with 12 boys and nine girls. The two procedures were conducted at one-month intervals in a counterbalanced fashion with this sample (i.e. the RS was done first in half the cases). The three samples were not significantly different in terms of child and parent age, child sex ratio or parental level of schooling. However, the sample of mothers differed from the two father samples in many respects. Mothers worked outside the home less ($F = 4.41, p < .05$; Scheffe, $p < .05$) and spent more time with their children ($F = 23.62, p < .001$; Scheffe, $p < .001$) than the fathers did. Mothers' family income was lower. This corresponds to the situation generally described in the literature.

Instruments

Sociodemographic questionnaire

A sociodemographic questionnaire was used to collect basic information on the parent, child and family (see Table 1).

The strange situation procedure (SS)

The SS is a procedure divided into eight episodes and which takes place in an unfamiliar room with toys. During the procedure, infants are exposed to mildly stressful events, including the entrance of an unfamiliar female adult and two separations from their mothers followed by reunions. Infant attachment patterns are coded by trained observers and classified as secure (B), insecure avoidant (A) or insecure resistant (C),

Table 1. Sociodemographic characteristics of the three samples.

	Sample 1 (fathers)	Sample 2 (mothers)	Sample 3 (fathers)
No. of dyads	21	22	21
Child's average age in months (range) at the time of the RS	15.8 (13.1–19.7)	14.8 (12.0–18.0)	15.5 (12.5–18.7)
Child's average age in months (range) at the time of the SS	–	16.0 (13.2–17.8)	16.0 (13.1–19.4)
Average number of children per family (range)	1.6 (1–5)	1.5 (1–3)	1.8 (1–4)
Parent's average age in years (range)	33.2 (24–47)	32.5 (20–43)	34.4 (25–49)
% born in North America	81	81	90
Schooling in years (range)	15.5 (8–21)	15.0 (11–19)	16.5 (10–26)
Annual family income greater than CAN\$80,000 (%)	47	25	57
Average time spent working per week (range)	40.8 (30–60)	32.5 (18–40)	43.5 (20–80)
Average time per week alone with child	11.2 (2–24)	36.8 (10–84)	9.8 (0–45)
% single parent	5	9.5	0

based on the Ainsworth et al. (1978) scoring system. Then, the Main and Solomon's (1990) scoring system is used to code disorganised attachment (D). This system produces a disorganisation score from 1 to 9, with the score of 5 being the cut-off point for placing a child in the D category. Agreement for the four-category scheme was 87% ($\kappa = .78$), while an agreement of 93% was obtained for organised versus disorganised categories ($\kappa = .88$). Finally, a correlation coefficient of .73 was obtained for the inter-rater reliability of the disorganisation scale.

The risky situation procedure (RS)

The RS is a standardised procedure designed to assess the quality of the father-child activation relationship in children aged 12–18 months. Like the SS, the RS is a 20-minute observational procedure that takes place in an unfamiliar room with toys and in the presence of a stranger. It is divided into six structured episodes during which the child is presented first with a social risk (an increasingly intrusive male stranger), then with a physical risk (a set of stairs), and then forbidden by the parent to climb. The RS is based on similar basic principals to those of the SS. In the SS, as conceived by Mary Ainsworth, the child's stress is gradually increased in order to trigger the attachment system. The ultimate objective is for the child to reach a balance between exploration of the environment and seeking of comfort from the significant parent. In the RS, the child is invited to take progressive risks in order to trigger the activation system, ideally a balance between exploration of the environment and acceptance by the child of limits imposed by the significant parent. With the exception of comforting the child at the child's request, in the SS, the parent's behaviour is controlled by a very detailed set of instructions in order to highlight the history of parent-child interactions rather than the child's immediate reactions to parental behaviour. In the RS, the parent is asked not to interact with the child and especially not to encourage the child to explore. However, the parent may comfort the child at any time and is asked to ensure the child's safety and protection.

The coding grid identifies children who have under-activated relationships, activated relationships and over-activated relationships. It is anticipated that in the RS under-activated children will engage in little exploration, be passive and anxious and remain close to the parent. Activated children will be confident and prudent in their exploration and will obey when the parent sets a limit. Over-activated children will be reckless and will not obey when the parent sets limits. It is also anticipated that the under-activated relationship will be related to parental overprotection, while the over-activated relationship be related to parental difficulty in obtaining obedience from the child. The coding grid also provides an activation score between 0 and 5 indicating the extent to which the child is optimally activated (with the score of 5 corresponding to the most positive activation relationship); the score allows statistical analysis to be performed (for example regressions) without it being necessary to regroup the under-activated and over-activated children, who reflect diametrically different types of relationships. The coding system with its five criteria was designed for ease of use by clinicians as well as researchers, requiring an average of 30 minutes per case. The full procedure is available from the first author. A training program will soon be available for those who would like further details regarding coding.

Average inter-rater agreement (κ) was 78% for classification of the three types (ranging from 60% to 90%), and 82% (ranging from 65% to 100%) for decisions

based on the five criteria. Correlation was .93 ($p < .001$) for the activation score. All cases were then discussed until a consensus could be reached.

Child characteristics

To assess the personal characteristics of children that might potentially be associated with child behaviours during the RS, it was decided to use a questionnaire evaluating different dimensions of the child temperament on the understanding that, as for all behaviour, what was being measured was a phenotype (Vaughn, Bost, & van IJzen-doorn, 2008), that is the result of the influence of heredity and the environment. Child temperament was assessed with the French version of the *Early Childhood Behavior Questionnaire* (Putnam, Gartstein, & Rothbart, 2006). The following eight scales were selected: frustration (11 items; $\alpha = .76$); shyness (12 items; $\alpha = .76$); activity level/energy (12 items; $\alpha = .61$); fear (11 items; $\alpha = .66$); high-intensity pleasure (12 items; $\alpha = .81$); impulsivity (7 items; $\alpha = .70$); inhibitory control (12 items; $\alpha = .81$); and sociability (8 items; $\alpha = .85$). The internal consistency data in the parenthesis are those obtained for the total sample ($n = 64$), sometimes by removing items to increase the alphas.

Parental behaviour

The use of questionnaires to assess parental behaviour posed a problem. Existing questionnaires for assessing parental behaviour had generally been designed based on models of maternal functions and validated with mothers (Paquette et al., 2009), while the objective of this study was to validate a procedure that had been developed based on a theory concerning paternal specificities (predominance). Research on paternal specificities is still in its early stages and few instruments have been validated with fathers (Paquette et al., 2009).

In order to study the development of preschool age children in connection with paternal involvement, the team created the *Questionnaire d'ouverture au monde* (Openness to the World Questionnaire – OWQ; Paquette et al., 2009) based on the activation relationship theory. It was validated with a sample of 266 fathers of children aged 26–69 months. Factor analysis highlighted three dimensions that together explain 42% of the total variance. Stimulation of perseverance (seven items; $\alpha = .63$) consists of encouraging the child to accomplish difficult things, overcome his or her limits and persevere in the face of adversity, introducing the child to sports, and inviting the child to explore or initiate contact with an unfamiliar child. Punishment (six items; $\alpha = .76$) consists of punishing or scolding the child if the child disobeys, does not try, or breaks something. Finally, stimulation of risk-taking (seven items; $\alpha = .60$) consists of encouraging the child to undertake risky activities and allowing the child a great deal of autonomy in the child's exploration of the environment. It was decided to use this questionnaire with the parents of children aged 12–18 months in the second and third samples ($n = 42$) even though it had not been validated with children of this age. Two of the internal consistency coefficients are not high but are acceptable.

Two scales from the *Montreal Father's Involvement Questionnaire* (MFIQ; Paquette et al., 2000) were used with the third sample ($n = 21$). However, although this instrument has been validated with 434 fathers, it was not developed based on the activation relationship theory. Basic care (six items; $\alpha = .76$) comprises items such as bathing, dressing, feeding, and nursing the child. Emotional support (11 items; $\alpha =$

.72) concerns parental behaviours that clearly communicate to the child that he or she is appreciated, loved, supported and protected.

Coding of parental behaviours during the risky situation was performed essentially with the aim of verifying whether the instructions given during the RS were followed, to ensure the validity of the procedure. The following behaviours were coded: non-care-related responses to the child's demands, initiation of interaction and stimulation between Episodes 1 and 4; types of supervision, encouragement, discipline and protection in Episodes 4 and 6. Encouragement included "holding out a hand to the child to encourage the child to follow", "touching the child to attract his or her attention", "using an object, hitting the stairs or clapping hands to attract the child's attention", "offering verbal or nonverbal congratulations" and "verbal encouragement". Discipline consisted of giving instructions, forbidding certain behaviours, removing or physically blocking the child. Protection consisted of "holding the child by the hand, another body part or the child's clothing while allowing the child to proceed at own speed on the stairs", or "using one or two arms to create a safety barrier around the child without making physical contact". Finally, several types of supervision were observed: "watches child somewhat distractedly from a distance while remaining seated or less than a step away from the chair" and "watches child attentively from a distance while remaining seated or less than a step away from the chair" during Episode 4, "remains more than an arm's length away from the child" and "remains at arm's length to the child or closer" during Episodes 4 and 6. Average inter-rater agreement for the two students was 91%, ranging from 73% to 100%.

Results

First study

Typology

Activated children (38%: 8/21) were able to interact with the stranger but withdrew when the latter became too intrusive. They climbed the stairs carefully but confidently and obeyed their father when he gave them an instruction or set a limit. Children classified as *under-activated* (33%: 7/21) would freeze up as soon as the stranger began to interact with them, and never attempted to climb the stairs by themselves. They would remain close to their father looking at the stairs from a distance or approach to try to touch the toys but without climbing the stairs. Children classified as *over-activated* (29%: 6/21) would remain at ease with the stranger throughout and climb the stairs impulsively without looking at what they were doing. They were reckless and did not obey when their parent set limits.

Relation to child characteristics (sex and temperament)

No significant difference was found in the distribution of the three types of activation based on the child's sex.

One-way ANOVA analysis revealed a significant difference between the three types of activation for the child impulsivity score (Table 2). The Scheffe post hoc test showed that the average impulsivity score of under-activated children was significantly lower than the score for the other two groups. Pearson's correlation revealed a significant association between the activation score and the impulsivity score ($r = .53$, $p < .05$), the result of a significant correlation found only for the boys ($r = .75$,

Table 2. Variance analysis of activation relationship classifications in the three samples.

Variables	Sample 1				Sample 2				Sample 3			
	UA	A	OA	F	UA	A	OA	F	UA	A	OA	F
Impulsivity	4.0 ^a	5.6 ^b	5.1 ^b	10.33***	4.2 ^a	5.1 ^{a, b}	5.7 ^b	5.01*	4.9	4.6	4.4	.30
Shyness	3.6	3.4	2.9	2.34	3.5 ^a	2.6 ^b	2.7 ^{a, b}	3.95*	3.4	3.2	2.6	1.21
Punishment					2.0	2.5	2.4	1.08	3.0	2.7	2.3	.80
Risk stimulation					3.9	4.4	3.8	1.62	3.8	4.3	4.4	1.24
Basic care									30.0	25.3	31.5	3.68*

* $p < .05$; *** $p < .001$.

^{a, b}Different letters mean significant differences in two by two comparisons (Scheffe post hoc: $p < .05$).

Read horizontally.

Note: UA = under-activated, A = activated, OA = over-activated.

$p < .05$; $r = .23$ in girls). An association was also found between the activation score and the sociability score ($r = .44$, $p = .05$), which again remained as significant only for the boys ($r = .64$, $p < .05$; $r = .27$ in girls). This signifies that the more impulsive or sociable a boy was, as described by his father, the higher the activation score would be.

Second study

Orthogonality between the risky situation and the strange situation

As one mother did not return to the university to complete the SS, the association between the two classifications was verified using 21 dyads. In the mother-child dyads, the results showed 38% activated children, 33% under-activated children and 29% over-activated children. Of the 16 children who were securely attached to their mother (76%), only 44% (7/16) had an activated relationship with their mother, 31% were under-activated and 25% were over-activated. A chi-square test between the two classifications was not significant. Further, variance analysis (t-test with secure/insecure) showed no significant difference between types of attachment with regard to activation score.

Relation to child's characteristics and parental behaviour

Activation relationship. It should be noted that, as in the first sample, no significant difference was found in the distribution of the three types of activation based on the child's sex.

One-way ANOVA analysis revealed significant differences among the three activation types for the child's impulsivity score and shyness score (Table 2). Scheffe tests showed the average impulsivity score for the under-activated children to be significantly lower than that of the over-activated children. Moreover, the average shyness score for the under-activated children was significantly higher than that of the activated children. Pearson's correlation revealed a significant association between the activation score and the shyness score ($r = -.61$, $p < .01$), but the association remained significant only for girls ($r = -.88$, $p < .01$; $r = -.35$ in boys). There was also a trend towards a positive relation between the activation score and child impulsivity ($r = .38$, $p = .09$); the relation was very significant for girls ($r = .92$, $p = .001$).

but non-significant for boys ($r = .11$). Finally, there was a significant correlation with sociability in boys ($r = .59, p < .05$; $r = .10$ in girls).

One-way analysis did not reveal any significant difference among the three types of activation for the three parenting behaviour scales of stimulation of risk-taking, stimulation of perseverance and punishment. Pearson's correlations showed no association between the activation score and these scales for the total sample, revealing trends toward the association of the activation score with punishment ($r = .55, p = .08$) and with stimulation of risk-taking ($r = .56, p = .08$) only for boys.

Attachment relationship. As predicted, one-way analysis showed a significant difference among the three types of attachment for the child sociability score ($F = 4.75, p < .05$). The Scheffe tests showed that the average sociability of secure children (6.1) was almost significantly higher than that of avoidant children (4.8; $p = .08$), but not higher than that of resistant children (5.1). One-way analysis did not reveal any significant difference among the three types of attachment for the three scales of parental behaviour: stimulation of risk-taking, stimulation of perseverance and punishment.

Third study

Orthogonality between the risky situation and the strange situation

The results showed 52% activated children, 29% under-activated children and 19% over-activated children in the father-child dyads. Of the 13 children who had secure attachment relationships with their father (62%), only 46% (6/13) had an activated relationship with their father; 39% were under-activated and 15% were over-activated. Finally, 71% ($n = 5$) of the seven children who had avoidant attachment with their father were activated. A chi-square test between the two classifications was not significant. Variance analysis (t -test with secure/insecure) showed no significant difference among the types of attachment for the activation score.

Relation to child's characteristics and parental behaviour

Activation relationship. It should be noted that the chi-square revealed a significant difference here regarding the child's sex in relation to the three types of activation ($\chi^2 = 10.43, p = .005$): there were more activated boys and more under-activated girls.

One-way analysis showed no significant difference among the three types of activation relationships for the temperament scales (Table 2). There was no significant correlation between the activation score and the temperament scales for the entire group.

One-way analysis did not reveal any significant difference among the three types of activation for the three parenting behaviour scales of stimulation of risk-taking, stimulation of perseverance and punishment (Table 2). However, one-way analysis did reveal a significant difference between the three types of activation relationships for frequency of basic care (Table 2). Scheffe tests showed that the average score for care for activated children was almost significantly less than the score for care for over-activated children ($p = .09$). This was confirmed by a significant correlation between the activation score and basic care ($r = -.64, p < .01$), the result of a significant correlation solely for girls ($r = -.82, p < .01$; $r = -.19$ in boys).

Attachment relationship. Given the presence of only one resistant child (C), the researchers opted for *t*-test analysis between secure (B) and insecure types (A + C); the latter showed no significant difference for temperament and parental behaviour scales with the OWQ. However, connections were found with one MFIQ scale: the emotional support given to secure boys tended to be greater than that given to insecure boys ($t = -1.85, p = .09$). It should be noted that there was no significant difference in basic care for secure and insecure children.

Total sample

Prevalence of activation types and attachment types

By combining of Samples 2 and 3 ($n = 42$), researchers obtained 69% secure children, 21.4% avoidant children and 9.5% resistant children. As in the literature, chi-square analyses showed that attachment-type prevalence does not differ based on the parent's or the child's sex.

The combination of the three samples ($n = 64$) produced 43.8% activated children, 31.3% under-activated children and 25% over-activated children. Chi-square analysis showed activation prevalence did not differ based on the parent's sex, but did based on the child's sex ($\chi^2 = 8.10, p < .05$): 71.4% of activated children were boys while 70% of under-activated children were girls. Univariate variance analysis – sex of parent \times sex of child – of the activation score confirmed the effect of the child's sex ($F = 5.88, p < .05$): the boys had a significantly higher activation score than the girls, with both mothers and fathers (Table 3).

Table 4 shows that 31% of the children were both secured and activated by the same parent, signifying children who were confident they would be comforted in times of distress and protected by limit-setting during their exploration of environments in which danger was present. The second most numerically important category (23.8%) was that of children who were both secure and under-activated, that is children who were adequately comforted in times of distress, but received little encouragement to explore their environment by themselves without the parent. Then came the children who were both secure and over-activated (14.3%), meaning children who were comforted and soothed in times of distress, but received little discipline. Then came the children who were both avoidant and activated (11.9%), meaning children who seemed independent of the parent in times of distress, but who would accept limits imposed by the latter during their explorations; it should be noted that the five cases concerned here only involved fathers, and primarily boys (four out of five).

The orthogonality that was verified between these two constructs in the partial samples was confirmed in the total sample by the fact that the chi-square was not significant. It was also confirmed by absence of any significant difference in activation scores for the three types of attachment ($F = 1.06, p = .36$). Obviously, it was normal to find a significant difference in activation scores for the three types of

Table 3. Average activation score (SD) as a function of the parent's sex and the child's sex.

Parent's sex	Boys ($n = 35$)	Girls ($n = 29$)	Total ($N = 64$)
Fathers ($n = 42$)	3.32 (1.17)	2.45 (1.28)	2.90 (1.28)
Mothers ($n = 22$)	2.92 (1.38)	2.11 (1.54)	2.59 (1.47)
Total ($N = 64$)	3.17 (1.25)	2.34 (1.34)	2.80 (1.35)

Table 4. Percentage (*n*) of dyads as a function of strange situation categories (A, B, C) and risky situation categories.

Risky situation	A	B	C	Total
Under-activated	2.4% (1)	23.8% (10)	4.8% (2)	31.0% (13)
Activated	11.9% (5)	31.0% (13)	2.4% (1)	45.2% (19)
Over-activated	7.1% (3)	14.3% (6)	2.4% (1)	23.8% (10)
Total	21.4% (9)	69.0% (29)	9.5% (4)	100.0% (42)

activation ($F = 51.06, p < .001$): Scheffe tests showed that activated children had an activation score (3.96) that was significantly higher than that of over-activated children (2.25; $p < .001$) as well as under-activated children (1.60; $p < .001$).

Effect of parental stimulation of risk-taking beyond child's characteristics

Results differed considerably from one sample to another. Variance analysis concerning the activation relationship revealed significant differences for child temperament (impulsivity and/or shyness) in Samples 1 and 2, but none in Sample 3. However, in the latter, there was a sex effect and a basic care effect. Further, a trend towards a relation between activation in boys and two parental behaviour scales (punishment, stimulation of risk-taking) was found in Sample 2, but not in Sample 3. The relation between activation in boys and the stimulation of risk-taking was confirmed by a significance correlation in the total sample produced by combining Samples 2 and 3 ($r = .44, p < .05$).

To verify whether parental behaviour explains activation after taking the child's sex and temperament into account, multiple regressions were conducted with the subjects of Samples 2 and 3 (see Table 5). Multiple regression analysis was performed by first forcing the child's sex into the model, then entering sociability, shyness and impulsivity, and finally entering stimulation of risk-taking in stepwise. The sex of the child and stimulation of risk-taking are the only two variables that are significant in the model and together explain 38% of the total variance (Table 5). This model confirms the importance of parental stimulation of risk-taking in the parent-child activation relationship, beyond child characteristics.

Relation to parental behaviour during RS

Mann-Whitney *U*-tests showed that mothers engaged in more discipline ($p < .001$) and close supervision than fathers (more than an arm's length and less than an arm's length: $p < .05$), and that fathers engaged in more low-monitoring supervision from a distance than mothers ($p < .001$). These tests also showed that the parents of girls responded to the child's demands more than the parents of boys ($p < .01$). However, no association was found between the activation relationship (types and score) and initiation of interaction, stimulation, encouragement and discipline, that is the parental variables that might have influenced coding results.

Table 6 presents significant correlations obtained between the activation score and frequencies of parental behaviours observed during RS. The activation score was negatively correlated with responses to the child's demands and attentive supervision of the child from a distance. The more the parent responded to the child's demands or

Table 5. Multiple regression on the activation score ($n = 42$).

	Variables	R^2	F change	β	t	p
Step 1		.24	10.16**			
	Child's sex			-.49	-3.19	.003
Step 2		.26	.29			
	Child's sex			-.54	-3.13	.004
	Sociability			-.16	-.93	.360
	Shyness			-.02	-.11	.960
	Impulsivity			.04	.24	.813
Step 3		.38	5.90*			
	Child's sex			-.49	-3.09	.004
	Sociability			-.23	-1.40	.172
	Shyness			-.08	-.50	.625
	Impulsivity			.03	.18	.855
	Risk stimulation			.37	2.43	.022

* $p < .05$; ** $p < .01$.

the more attentively the parent watched the child from a distance, the less activated the child was. However, the correlation between the activation score and attentive supervision from a distance continued to be significant for girls only (Table 6). The activation score was also positively correlated with the frequency of times the parent remained more than an arm's length away from the child during Episode 6 of the RS. However, this correlation was only significant for fathers and boys (Table 6). Finally, a significant negative correlation was obtained between the activation score and parental protection only for boys (Table 6): the more the parent (over)protected the boy, the less activated the latter was.

Comparison of the three types of activation using Kruskal–Wallis tests revealed significant differences in parental behaviours observed during the RS. Parents of under-activated children responded to the demands of their children more than the parents in the other two groups ($p < .01$). Parents of over-activated children engaged in more attentive supervision from a distance than parents of activated children, with the latter engaging in more of this type of supervision than parents of under-activated children ($p < .05$). These results were especially true of fathers. Fathers of under-activated children

Table 6. Spearman correlations (ρ) between the activation score and parental behaviours observed during the RS, as a function of the sex of child and parent.

Parental behaviours	All ($N = 63$)	Boys ($n = 35$)	Girls ($n = 28$)	Fathers ($n = 42$)	Mothers ($n = 21$)
Non-care responses to child's demands (Episodes 1–4)	-.26*	-.09	-.29	-.23	-.30
Attentive supervision from a distance (Episode 4)	-.32*	-.22	-.45*	-.29 [†]	-.38 [†]
Supervision at more than an arm's length (Episode 6)	.33**	.61***	.17	.39*	.11
Protection (Episodes 4 and 6)	-.12	-.49**	.21	-.06	-.12

[†] $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

responded more to the demands of the child than fathers in the other two groups ($p < .01$). The fathers of over-activated children tended to watch attentively from a distance more than those in the other two groups ($p = .07$). Fathers of activated children tended to do more arm's length supervision (at Episode 6) than fathers of over-activated children, who tended to do more arm's length supervision than fathers of under-activated children ($p = .08$).

Relation to disorganisation

Five children were found to have disorganised attachment (D): three were avoidant (A) in relation to the father, while one was secure (B) and one avoidant (A) in relation to the mother. Given that all the children obtained a disorganisation score ranging from 1 to 9 during coding, it was possible to use this score in variance analyses and correlations. One-way analysis showed a significant difference among types of attachment for the disorganisation score ($F = 5.53, p < .01$); the Scheffe tests showed that avoidant children had a significantly higher disorganisation score (4.6) than secure children (2.2; $p < .01$), with resistant children having an intermediary score (2.8).

One-way analysis also revealed a significant difference among types of activation for the disorganisation score ($F = 3.49, p < .05$); the Scheffe tests showed that over-activated children had significantly higher disorganisation scores (3.9) than under-activated children (1.7; $p < .05$), with activated children having an intermediate score (2.8). In sum, disorganisation seems to be associated with both classifications. The children with the greatest likelihood of exhibiting symptoms of disorganisation were those with an avoidant (A) attachment relationship and an over-activated activation relationship with the parent, in other words, children who were not protected at all in their interactions with their environment.

Discussion

This initial step in the validation of the RS is extremely encouraging. It shows that the procedure evaluates a relatively different construct from the SS. First, the two measures are orthogonal: 31% of children have both a secure relationship and an activated relationship with the same parent, which corresponds to chance. Further, boys are more activated than girls while there is no sex difference regarding security in the SS. Most studies investigating parent reports of temperament as predictors of attachment have failed to yield significant associations between attachment classification and measures of temperament (Vaughn et al., 2008). The results of the RS validation studies reveal significant associations with temperament, as much with regard to attachment classification as to activation classification, but for different dimensions of temperament. In one sample, under-activated children had higher shyness scores than activated children, while in two samples over-activated children had higher impulsivity scores than under-activated children. Sociability seems to be tied to both classifications. On the one hand, these findings confirm the higher sociability scores of secure children (boys and girls) as compared to insecure children. On the other hand, activated boys have higher sociability scores than non-activated boys. The lack of difference in impulsivity between activated children and over-activated children provides support for a regulatory role by the parent in the activation relationship. There is a very strong likelihood that parental behaviours interact with different aspects of the child's temperament (which, being phenotypes, are not purely constitutional) in

determining parent–child relationship. Finally, the regression with the total sample shows that the stimulation of risk-taking significantly explains variance of the activation score after controlling for child characteristics (sex and temperament). Thus, the results demonstrate that the activation relationship reflects the history of parent–child interactions and not only child characteristics.

The hypothesis that fathers activate children more than mothers do is not borne out by the comparison of activation scores. However, several results indicate that future studies may provide confirmation thereof. First, the fathers had a tendency to engage in greater stimulation of risk-taking with activated boys than with non-activated boys. A stimulation of risk-taking scale with better internal consistency would also allow for more conclusive results, hence the importance of validating the OWQ with children aged 12–24 months. As well, fathers engaged in more low-monitoring supervision from a distance during the RS than did the mothers (indicator of greater risk-taking), while the mothers engaged in greater close supervision and discipline. The positive correlation between the frequency of supervision at more than an arm's length distance and the activation score was significant for boys in interaction with their fathers. Further, fathers reported punishing children more than did the mothers ($t = 2.04, p < .05$), and giving more care to girls than to boys ($t = -2.22, p < .05$). Finally, given that the fathers provided less basic care to activated children, it is possible that little basic care combined with the stimulation of risk-taking promotes activation.

As well as ensuring the validity of the typological coding, the coding of parental behaviours during the RS provided support for the idea that under-activation is tied to parental overprotection, while over-activation is tied to a lack of protection by parents. As was to be hoped given that parents were instructed not to stimulate or encourage the child to explore, no association was found between the type of activation relationship and parental encouragement. However, parents did not always respect the instruction not to respond to the child's demands other than comfort-seeking during the first four episodes, which does not invalidate the procedure and instead constitutes an indicator of overprotection: the parents of under-activated children have a greater tendency to respond to the non-care-related demands of their children than the parents in other types of activation relationships. In addition, supervision from a distance may not allow the parent to ensure sufficient protection in case of danger, as parents of over-activated children tended to watch attentively from a distance more than parents in the other two types of activation relationships. The negative correlation between attentive supervision from a distance and activation score was especially significant for girls. A short parent–child distance during exploration is perhaps more important for girls as the more parents supervised from a distance, the less activated the girls were. Further, fathers of activated children tend to supervise more from slightly more than arm's length than fathers of over-activated children, and fathers of over-activated children tend to supervise more from this distance than do fathers of under-activated children. This father–child distance, in which the father is neither too close nor too far from the child, allows the father to protect the child in case of danger while providing the child with the necessary room to practice abilities independently. The more parents protect boys from a very close distance (by making a barrier around the child with their hands as the child moved, with or without physical contact), the less activated the boys are.

These results should encourage researchers to consider the two dimensions of comfort and activation in their research on parent–child attachment in order to better predict child development. The next step in validation will be to demonstrate temporal stability (test-retest) of the evaluations performed with the RS. The following step will

be to show that the RS taken at 12–18 months predicts the behaviour of children several years later. It would be especially interesting to verify to what extent fathers and mothers play complementary roles in terms of attachment, in the broad sense of the word, to ensure optimal child development. To do this, it would be necessary to do the SS with the parent who is the primary attachment figure and the RS with the parent who is the primary activation figure. The activation relationship theory, which considers aggression a form of risk-taking, predicts that the father–child relationship is a greater determinant of the development of aggression problems in children, especially boys, than the mother–child relationship. Indeed, to date, problems of aggression have been linked more to disorganisation (Lyons-Ruth & Jacobvitz, 2008) than to the A–B–C types of attachment (Berlin, Cassidy, & Appleyard, 2008; Deklyen & Greenberg, 2008). The prediction can be made that over-activated children will have a greater tendency to develop externalising problems while under-activated children will have a greater tendency to develop internalising problems. Finally, the discovery here of a link between the activation relationship and disorganisation opens an area of possible study to explore and develop a better understanding of the determinants of disorganisation. The results suggest that disorganisation is tied to an extreme lack of protection of the child in his or her environment.

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Note

1. As our brain today is still the same as that of the hunter-gathers of the Pleistocene Epoch, the period spanning from 1.8 million to 10,000 years ago (Tooby & Cosmides, 1990).

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