

# Harsh parenting practices mediate the association between parent affective profiles and child adjustment outcomes: Differential associations for mothers and fathers

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DOI: 10.1177/0165025418769376  
journals.sagepub.com/home/ijbd



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## Abstract

Children's early emotional environment strongly influences their later behavioural development. Yet, besides maternal depression, limited knowledge exists about the effect of other emotions and the role of fathers. Using 290 triads (mother/father/child), we investigated how positive (SEEKING, CARING, PLAYFULNESS) and negative (FEAR, ANGER, SADNESS) dimensions of mothers' and fathers' affectivity relate to their offspring's externalizing and internalizing behaviours directly as well as indirectly via parenting practices. Parental variables were measured when children were 4 years old and children's behaviours were measured at 8 years of age. Latent Profile Analysis identified three parental affective profiles: *low negative emotions*, *balanced*, and *high emotional*. Structural equation models showed that, for boys, mothers' *low negative emotions* and *high emotional* profiles predicted later internalizing behaviours (direct effect;  $\beta = -0.21$  and  $\beta = 0.23$ ), while fathers' *low negative emotions* profile predicted externalizing behaviours indirectly ( $\beta = -0.10$ ). For girls, mothers' profiles (*low negative emotions* and *high emotional*) predicted both internalizing ( $\beta = -0.04$  and  $\beta = 0.07$ ) and externalizing ( $\beta = -0.05$  and  $\beta = 0.09$ ) behaviours indirectly, but no effects of fathers' profiles were found. Mothers' and fathers' affective profiles contributed to the behavioural development of their offspring in different ways, according to the type of behaviour (internalizing or externalizing) and the child's sex. These findings may help in tailoring existing parenting interventions on affective profiles, thus enhancing their efficacy.

## Keywords

affective profiles, externalizing behaviours, internalizing behaviours, Latent Profile Analysis, parenting

Children's early emotional environment has a strong influence on children's later behavioural development. A number of studies have shown that maternal mood disorders and neuroticism (i.e., a personality trait describing the propensity to experience negative emotions) are risk factors for both internalizing and externalizing problems in children and adolescents (Birmaher et al., 2009; Ellenbogen & Hodgins, 2004; Goodman et al., 2011). These studies documented both direct and indirect effects on offspring behaviour and psychopathology. Parenting practice is among the most-investigated mechanisms to explain the indirect influence of parental emotionality on offspring behavioural outcomes. For example, parents with depressive symptoms have been found to exhibit more negative parenting (e.g., harsh/coercive) compared to non-depressed parents, which in turn was associated with negative offspring outcomes (Elgar, Mills, McGrath, Waschbusch, & Brownridge, 2007). Similarly, neuroticism was consistently associated with behavioural problems in children via the mediating effect of negative parenting (Prinz et al., 2004, 2005; van Aken et al., 2007).

However, the study of the effect of parent's emotionality on offspring behavioural outcomes has essentially focused on parental psychopathology (e.g., major depression) or personality traits related to negative affectivity (e.g., neuroticism; Elgar et al.,

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2007; Prinzie et al., 2004; van Aken et al., 2007). Nevertheless, the available evidence on parent's positive emotions suggests their importance in children behavioural regulation. For instance, maternal agreeableness traits moderated associations between child dysregulation and several aspects of adjustment at school in toddlers (Hipson, Gardiner, Coplan, & Ooi, 2017). In the same way maternal joy positively impacts mothers' sensitive parenting (Dix, Gershoff, Meunier, & Miller, 2004). These findings emphasize the need to investigate both positive and negative emotions when studying the role of parents' affectivity on offspring behaviours.

Person-centred statistical techniques (such as Latent Profile Analysis, LPA) offer powerful tools to investigate the association among several emotional dimensions, especially the interplay between positive and negative emotions within the individual. Uncovering distinct patterns of association among the positive and negative emotions of each individual may enable to distinguish homogeneous typologies (i.e., affective profiles) that each could have a distinct effect on his/her offspring's behavioural development.

Additionally, most studies focused on the role of mothers' affectivity and parenting (Parent, Forehand, Pomerantz, Peisch, & Seehuus, 2017), and little is known about the role that fathers play. It is unknown whether mothers' and fathers' emotionality play similar or different roles, especially in a model that considers both parents together. A growing body of research, however, suggested important differences between mothers and fathers (Majdandžić, Möller, de Vente, Bögels, & van den Boom, 2014; Möller, Nikolić, Majdandžić, & Bögels, 2016). For instance, a recent meta-analysis found that the association between parenting and child anxiety was stronger for fathers than for mothers (Möller et al., 2016).

Finally, most studies have examined only one child outcome (i.e., internalizing or externalizing behaviour), overlooking that behavioural dimensions are most often interrelated, especially in childhood (Achenbach, Ivanova, Rescorla, Turner, & Althoff, 2016).

This study aimed to address those gaps in the literature. The objective was to investigate the associations between mothers' and fathers' affective profiles and offspring externalizing and internalizing behaviours, and if these associations are mediated by harsh parental practices. Based on the discussed evidence, we hypothesized (1) parental negative and positive emotionality to have opposite effects, and (2) harsh parenting to mediate the association between parents' emotionality and offspring behaviours. We expected this mediation effect to be stronger for fathers than mothers.

## Methods

### Participants

Participants included families with a child born between June 2003 and April 2004 in Montreal, Canada, enrolled in the EMIGARDE cohort. Parent's affective dimensions and parenting practice were measured when children were 4 years of age and children's behaviour at 8 years of age (hereafter referred to as T1 and T2). At T1, data was available for  $N = 395$  triads, that is, child, father and mother. Parent's affective dimensions were assessed in a subsample of parents, thus the final sample resulted in  $n = 290$  triads (141 children were boys, 48.6%; Table 1).

The study was approved by the Sainte-Justine Hospital Research Center and McGill Institutional Review Boards. Informed consent was obtained annually from all participants.

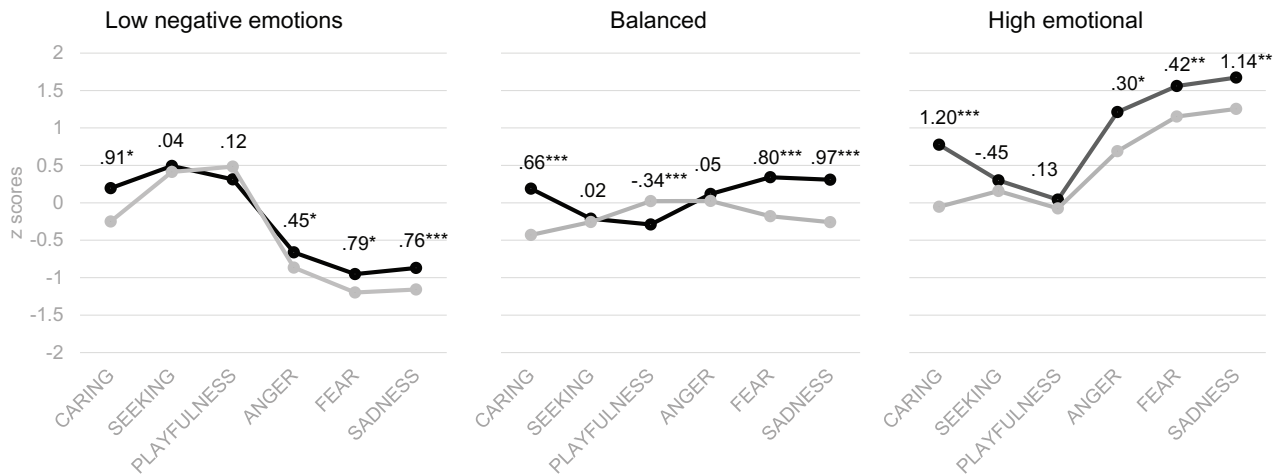
**Table 1.** Demographic and clinical characteristics of our participants.

	Sample $n = 290$
<b>Family characteristics</b>	
Insufficient income, $N$ (%) <sup>*</sup>	21 (7.2)
<b>Mother characteristics</b>	
Age at childbirth, years, mean (SD) <sup>*</sup>	33.6 (4.8)
Smoking during pregnancy, $N$ (%) <sup>*</sup>	27 (6.9)
Depression during pregnancy (Centre for Epidemiological Studies Depression scale score $\geq 16$ ), $N$ (%) <sup>*</sup>	52 (18.0)
<b>Education, <math>N</math> (%)<sup>*</sup></b>	
University degree	147 (51.0)
Post-secondary education	27 (9.3)
High school degree	63 (21.7)
No secondary education	4 (1.4)
Harsh parenting, mean (SD) <sup>**</sup>	3.3 (1.2)
<b>Father characteristics</b>	
Age at childbirth, years, mean (SD) <sup>*</sup>	36.4 (5.9)
<b>Education, <math>N</math> (%)<sup>*</sup></b>	
University degree	121 (41.7)
Post-secondary education	28 (9.7)
High school degree	70 (24.1)
Partial secondary education	10 (3.4)
Harsh parenting, mean (SD) <sup>**</sup>	2.6 (1.2)
<b>Child characteristics</b>	
Age, years, mean (k) <sup>**</sup>	4.35 (0.27)
Sex (male), $N$ (%)	141 (48.6)
Peabody Picture Vocabulary Test, mean (SD) <sup>**</sup>	49.9 (19.2)
Hyperactivity, mean (SD)	3.2 (2.2)
Physical aggression, mean (SD)	1.4 (1.5)
Anxiety/depression, mean (SD)	2.5 (2.1)
Emotional problems, mean (SD)	2.6 (1.8)

Note. The variables are measured when children are eight years of age unless otherwise specified, namely: \* Measured when children are two years of age. \*\* Measured when children are four years of age. Some percentages are < 100% because of missing data.

### Measures

**Parents' affective profiles.** The Affective Neuroscience Personality Scales (ANPS) (Pahlavan, Mouchiroud, Zenasni, & Panksepp, 2008) was used to assess parental affective personality. The ANPS measures the behavioural correlates of six emotional brain systems (Panksepp, 2005): SEEKING/interest (e.g., being curious, exploring, positively anticipating new experiences), CARING/nurturance (e.g., drawn to children and pets, feeling soft-hearted toward animals and people in need, feeling empathy), PLAYFULNESS/joy (e.g., having fun, playing games with physical contact), FEAR/Anxiety (e.g., feeling tense, worrying, struggling with decisions), ANGER/rage (e.g., feeling hot-headed, easily irritated/frustrated, expressing anger), and SADNESS/panic/separation distress (e.g., feeling lonely, crying frequently, thinking about past relationships). Each subscale consists of 14 items, rated on a 4-point scale (0 = *totally disagree* to 3 = *totally agree*;  $\alpha$  range = 0.77–0.89; Orri et al., 2016; Pingault, Falissard, Côté, & Berthoz, 2012; Pingault, Poug, Grèzes, & Berthoz, 2012). The averaged ANPS scores between T1 and T2 were used for each parent. Latent Profile Analysis, a specific case of mixture model, was applied to the six ANPS subscales following previous publications (Orri et al., 2017; see also: Supplementary material S1).



**Figure 1.** Affective profiles of mothers (black) and fathers (grey),  $n = 290$ .

Note. The numbers inside the figures represent effect sizes (Hedge's  $g$ ) for the mean differences in the Affective Neuroscience Personality Scales. Significance of these differences has been tested using  $t$  tests, and  $p$  values are reported as follows: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

**Children's behaviour.** At T2, mothers assessed internalizing and externalizing behaviours using the Behaviour Questionnaire, developed for the Canadian National Longitudinal Study of Children and Youth, which incorporates items from the Child Behavior Checklist (Achenbach, Edelbrock, & Howell, 1987), the Ontario Child Health Study Scales (Offord, Boyle, & Racine, 1989), and the Preschool Behavior Questionnaire (Behar, 1977). Externalizing behaviours included hyperactivity (six items; e.g. "could not sit still, was restless or hyperactive";  $\alpha = 0.79$ ) and physical aggression (10 items; e.g. "reacted in an aggressive manner when teased";  $\alpha = 0.84$ ). Internalizing behaviours included anxiety (five items; e.g. "was too fearful or anxious";  $\alpha = 0.76$ ) and emotional problems (four items; e.g. "seemed to be unhappy or sad";  $\alpha = 0.63$ ). Items were rated on a three-point scale (0 = *never* to 2 = *often*), and each subscale ranged from 0 to 10.

**Parenting.** At T1, harsh parenting was measured using items from Strayhorn and Weidman's Parent Practices Scale, previously used in the Canadian National Longitudinal Study of Children and Youth. The items measure harsh/coercive behaviours such as giving punishments that depend on the parents' mood, and using physical punishment (e.g., "When he/she broke the rules or did things that he/she was not supposed to, how often did you use physical punishment?"). The items were rated by mothers and fathers (separately) using a 4-point scale (i.e., 0 = 1–2 times/week to 4 = several times/day; subscale range: 0–10;  $\alpha = 0.65$ ).

### Statistical analysis

Associations between the estimated latent affective profiles of parents and their offspring's behaviour were studied using multiple-group Structural Equation Modelling (SEM) with Maximum Likelihood estimation. Parents' affective profiles were entered in the model as binary indicator variables (hard coding) to simplify the model. This was justified by the high entropy of our model (0.87) suggesting good classification, thus minor bias when ignoring classification uncertainty. We used children's sex as the grouping variable in order to estimate gender-specific regression paths. Goodness-of-fit was evaluated using the  $\chi^2$  test ( $p > .05$  = good fit), the Comparative Fit Index (CFI  $> 0.95$  = good fit) and the Root

Means Square Error Approximation (RMSEA  $< 0.06$  = good fit). Two latent variables were used to represent externalizing behaviours (hyperactivity and physical aggression subscales) and internalizing behaviours (emotional problems and anxiety subscales).

The statistical significance of the indirect effects (of parents' affective profiles on children's behaviour via harsh parenting) was tested using a 95% bias-corrected and bootstrapped confidence interval. The proportion of the total effect mediated ( $P_M$ ; i.e. the proportion of effect of parents' affective profiles on children's behaviour operating through the mediator) was calculated by the ratio of the indirect effect to the total effect, and expressed as a percentage. Analyses were performed using R 3.3 (R Core Team, 2016) and *Mplus* 7.4 (Muthén & Muthén, 1998–2015).

## Results

### Parents' affective profiles

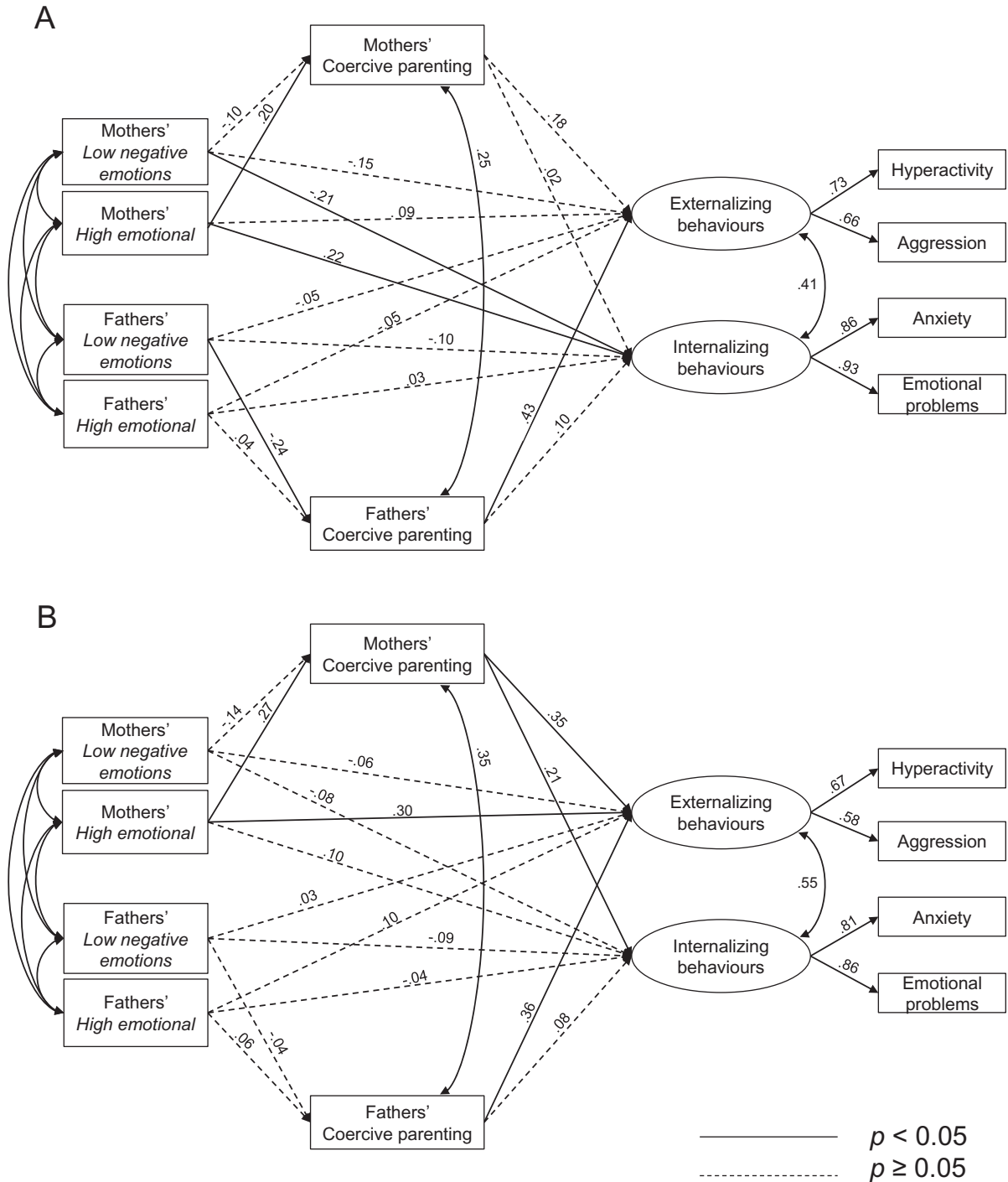
Three parental affective profiles were identified using LPA (Figure 1; see also Orri et al., 2017 and Supplementary material S1): low negative emotions (Mothers:  $n = 58$ , 21.9%; Fathers:  $n = 65$ , 24.5%), balanced (Mothers:  $n = 172$ , 64.9%; Fathers:  $n = 165$ , 62.3%), and high emotional (Mothers:  $n = 35$ , 13.2%; Fathers:  $n = 35$ , 13.2%).

### Model fit and overall description of the model

Our model (Figure 2) showed an excellent fit to the data:  $\chi^2(74) = 65.86$ ,  $p = .739$ ; RMSEA = 0.000, CI<sub>90</sub> = 0.000–0.036; CFI = 1.000 (see also Supplementary material S1). Different patterns of associations were found that are described in what follows, which depended on the gender of both the parent and the child (Table 2).

### Associations between parents' affective profiles and harsh parenting

Compared to the *balanced* profile (reference group), the *low negative emotions* profiles were associated with low levels of harsh



**Figure 2.** Multiple groups structural equation model  
 Note. The figure shows the standardized regression coefficients of the model for boys (A) and girls (B).

parenting, while the *high emotional* profiles were associated with high levels of harsh parenting. This was found for both boys and girls. The association was statistically significant for mothers in the *high emotional* profile for boys ( $B = 0.84 [0.16; 1.52], \beta = 0.20, p = 0.016$ ) and girls ( $B = 0.90 [0.35; 1.50], \beta = 0.27, p = 0.002$ ), as well as for fathers in the *low negative emotions* for boys, but not for girls (boys,  $B = -0.66 [-1.13; -0.16], \beta = -0.24, p = 0.007$ ; girls,  $B = -0.10 [-0.59; 0.38], \beta = -0.04, p = 0.623$ ).

**Associations between harsh parenting and children’s behaviour**

For boys and girls, harsh parenting was associated with higher externalizing and internalizing behaviours. Concerning fathers’ harsh parenting, the association was statistically significant for externalizing behaviours (boys,  $B = 0.62 [0.19; 0.98], \beta = 0.43, p = 0.003$ ; girls,  $B = 0.41 [0.12; 0.72], \beta = 0.35, p = 0.007$ ),

**Table 2.** Estimated direct and indirect effects in the structural equation model,  $n = 290$ .

	Boys ( $n = 141, 48.6\%$ )			Girls ( $n = 149, 51.4\%$ )		
	B (SE)	95% CI	$\beta$	B (SE)	95% CI	$\beta$
<b>Externalizing behaviours</b>						
<b>Direct effects:</b>						
Mother Low negative emotions	-0.63 (0.42)	-1.42; 0.22	-0.15	-0.19 (0.30)	-0.77; 0.41	-0.06
Mother High emotional	0.57 (0.69)	-0.71; 2.06	0.09	1.04 (0.38)	0.36; 1.84	0.30
Father Low negative emotions	-0.20 (0.50)	-1.20; 0.77	-0.05	0.08 (0.32)	-0.55; 0.71	0.03
Father High emotional	-0.26 (0.49)	-1.26; 0.68	-0.05	0.39 (0.44)	-0.46; 1.26	0.10
<b>Indirect effects via parenting:</b>						
Mother Low negative emotions	-0.08 (0.09)	-0.50; 0.01	-0.02	-0.15 (0.11)	-0.59; -0.02	-0.05
Mother High emotional	0.22 (0.20)	-0.20; 0.65	0.04	0.32 (0.19)	0.002; 0.73	0.09
Father Low negative emotions	-0.41 (0.18)	-1.04; -0.17	-0.10	-0.041 (0.11)	-0.43; 0.11	-0.01
Father High emotional	0.08 (0.24)	-0.54; 0.52	0.02	0.08 (0.17)	-0.31; 0.42	0.02
<b>Internalizing behaviours</b>						
<b>Direct effects:</b>						
Mother Low negative emotions	-0.97 (0.39)	-1.79; -0.24	-0.21	-0.32 (0.37)	-1.06; 0.36	-0.08
Mother High emotional	1.54 (0.65)	0.28; 2.86	0.22	0.41 (0.41)	-0.42; 1.20	0.10
Father Low negative emotions	-0.43 (0.50)	-1.53; 0.42	-0.10	-0.36 (0.34)	-1.01; 0.34	-0.09
Father High emotional	0.15 (0.59)	-0.89; 1.48	0.03	-0.20 (0.48)	-1.17; 0.73	-0.04
<b>Indirect effects via parenting:</b>						
Mother Low negative emotions	-0.01 (0.07)	-0.34; 0.07	0.00	-0.11 (0.09)	-0.49; -0.02	-0.03
Mother High emotional	0.03 (0.19)	-0.43; 0.40	0.00	0.24 (0.16)	-0.03; 0.60	0.06
Father Low negative emotions	-0.10 (0.15)	-0.62; 0.09	-0.02	-0.01 (0.05)	-0.30; 0.03	0.00
Father High emotional	0.02 (0.10)	-0.18; 0.30	0.00	0.02 (0.08)	-0.13; 0.29	0.01

Note. B = Unstandardized estimate; SE = Standard Error; 95% CI = bias-corrected bootstrap CI;  $\beta$  = standardized estimate (effect size).

but not for internalizing behaviours (boys,  $B = 0.16 [-0.25; 0.56]$ ,  $\beta = 0.10$ ,  $p = 0.460$ ; girls,  $B = -0.12 [0.19; 0.43]$ ,  $\beta = 0.08$ ,  $p = 0.462$ ). Mothers' harsh parenting was associated with girls' externalizing ( $B = 0.36 [0.08; 0.66]$ ,  $\beta = 0.35$ ,  $p = 0.018$ ) and internalizing ( $B = 0.27 [0.02; 0.54]$ ,  $\beta = 0.21$ ,  $p = 0.043$ ) behaviours, but not with boys' externalizing ( $B = 0.26 [-0.14; 0.66]$ ,  $\beta = 0.18$ ,  $p = 0.208$ ) or internalizing ( $B = 0.04 [-0.33; 0.46]$ ,  $\beta = 0.02$ ,  $p = 0.860$ ) behaviours.

### Associations between mothers' affective profiles and children's behaviour

Mother's *high emotional* profile had a direct ( $B = 1.04 [0.36; 1.84]$ ,  $\beta = 0.30$ ,  $p = 0.005$ ) and indirect ( $B = 0.32 [0.002; 0.73]$ ;  $\beta = 0.09$ ;  $P_M = 23.5\%$ ) effect through harsh parenting on girls' externalizing scores, while mothers' *low negative emotions* profile had an indirect effect through harsh parenting on girls' externalizing scores ( $B = -0.15 [-0.59; -0.02]$ ;  $\beta = -0.05$ ;  $P_M = 44.0\%$ ). No effect of the mothers' profiles on boys' externalizing behaviours was found.

Concerning internalizing behaviour, direct effects of mothers' *low negative emotions* ( $B = -0.99 [-1.79; -0.24]$ ,  $\beta = -0.21$ ,  $p = 0.012$ ) and *high emotional* profiles ( $B = 1.54 [0.28; 2.86]$ ,  $\beta = 0.22$ ,  $p = 0.018$ ) were found for boys, while only indirect effects through harsh parenting of mother's *low negative emotions* profile ( $B = -0.11 [-0.49; -0.02]$ ;  $\beta = -0.03$ ;  $P_M = 25.5\%$ ) and (as a trend) *high emotional* profile ( $B = 0.24 [-0.03; 0.60]$ ;  $\beta = 0.06$ ;  $P_M = 36.9\%$ ) were found for girls.

### Associations between fathers' affective profiles and children's behaviour

We found no direct effects of fathers' profiles on their child's (boy or girl) externalizing behaviours. However, a significant negative indirect effect of the fathers' *low negative emotions* profile on externalizing behaviours via harsh parenting was evidenced for boys ( $B = -0.41 [-1.04; -0.17]$ ;  $\beta = -0.10$ ;  $P_M = 67.2\%$ ), but not for girls. Regarding internalizing behaviours, no effects (direct or indirect) were found for either boys or girls.

## Discussion

This study investigated the direct and indirect (via harsh parenting) associations between parents' emotionality (i.e., ANPS-defined affective profiles) and children's externalizing and internalizing behaviours in middle childhood.

The three empirically derived affective profiles are qualitatively similar for mothers and fathers, and the negative emotions (FEAR, ANGER and SADNESS) are those that most discriminate between the three profiles. The *low negative emotions* profile (in which positive emotions are frequent) and the *high emotional* profile (in which negative emotions are frequent) have opposite effects. The former is associated with low scores on both internalizing and externalizing behaviours, and the latter with high scores. In the same way, compared to parents having a *balanced* profile, those having a *low negative emotions* profile used less harsh parenting practices, whereas those having a *high emotional* profile used more harsh parenting practices. These findings are consistent with the literature showing the deleterious effects of mothers' negative

affect traits through mental disorders (e.g., depression), or negative-valence personality traits (e.g., neuroticism), on their offspring's outcomes on the one hand (Birmaher et al., 2009; Ellenbogen & Hodgins, 2004; Goodman et al., 2011), and harsh parenting on the other hand (Bornstein, Hahn, & Haynes, 2011; Lovejoy, Graczyk, O'Hare, & Neuman, 2000; Prinzie, Stams, Deković, Reijntjes, & Belsky, 2009). However, it is worth noting that the *high emotional* mothers present high levels of CARING, which describes nurturing individuals who are inclined to take care of children and respond to offspring's emotional needs (Panksepp, 2006). These same characteristics are infrequently associated with harsh parenting practice. We found that the *high emotional* profile was associated with high use of harsh parenting practice and high externalizing/internalizing behaviours, suggesting that the effect of negative emotions reduced the expected positive effect of CARING. In particular, parents having both high levels of CARING and high levels of FEAR and SADNESS might overprotect their child using more harsh/coercive practices. For instance, they might prevent the child from adequately exploring the environment since this requires the parent to tolerate anxiety regarding potential danger (Teetsel, Ginsburg, & Drake, 2014).

Although mothers' and fathers' profiles were qualitatively similar, our findings suggest that they contribute differently to their offspring's behavioural development (internalizing or externalizing behaviours), act through different mechanisms (direct or indirect), and depend on the sex of the child. For boys, the association between mothers' *low negative emotions* and *high emotional* profiles and internalizing behaviours (direct effect) were stronger than for the corresponding fathers' profiles. The indirect effect of fathers' *low negative emotions* profile on externalizing behaviours was stronger than the corresponding indirect effect of the mothers' profile. For girls, only mothers' profiles (*low negative emotions* and *high emotional*) showed significant associations with internalizing and externalizing behaviours. The effect sizes of these associations were larger than the ones observed for the corresponding fathers' profiles. This finding is in contrast with previous studies that highlighted no differences in the influence of mothers and fathers' neuroticism on externalizing behaviours or child maladjustment (Elgar et al., 2007; Prinzie et al., 2005).

Concerning the nature of the associations, direct effects were found for mothers' profiles only (on internalizing behaviours for boys and externalizing behaviours for girls), but not for fathers' profiles (only indirect effects were shown on externalizing behaviours for girls). Although the size of the indirect effects of *low negative emotions* profiles were small, these are not negligible. Indeed, since the signs of the terms composing this effect are opposite (*low negative emotions* profiles decrease the use of harsh parenting, while harsh parenting increase the behavioural scores), this suggests that this affective profile may have an important role in reducing the use of harsh parenting, although the negative effect of harsh parenting on children's behaviour remains. Additionally, the proportion of the effect mediated were important (23.5%–67.2%), which indicated that these are important mechanisms to take into account to understand the pathways through which parents' affectivity influences their child's behaviours.

Unravelling the mechanisms through which parental affectivity influences the children's behavioural development could have important implications for designing effective interventions. For example, most interventions focusing on parenting typically employ a "one size fits all" approach without accounting for the characteristics of the parents nor the impact of parental sex on child

outcomes, both of which may help to improve current intervention efforts. If personality-targeted interventions have revealed their efficacy in contexts such as the reduction of alcohol use among adolescents (Newton et al., 2016), to our knowledge, they have to date never been used for parenting interventions. The initial evidence offered by our study may help to pave the way for future work in this area. For instance, the use of genetically-informed designs (e.g., twin or adoption studies) may help to better understand heritable patterns linking parents' emotionality and children's behaviour, and may help to disentangle genetic versus environmental contributions of these associations. Furthermore, as prior studies supported a transactional model of influence between parenting practices and children behaviour in the development of psychopathology (Stone, Mares, Otten, Engels, & Janssens, 2016), a more sophisticated modelling approach that includes transactional effects may provide useful information for the understanding of such complex associations.

### Limitations

First, our sample was not randomly selected, and the ANPS was only administered to a subsample of parents. Included parents had higher levels of education compared to the general population, thus the results may not be generalizable. Second, child outcomes relied exclusively on maternal reports, raising the possibility of shared method variance. Third, as our study had only two time-points, alternative models could not be examined.

### Conclusions

Mothers' and fathers' affective profiles contribute differently to children's externalizing and internalizing behaviours, with different associations for boys and girls. As hypothesized, harsh parenting emerged as an important mediation mechanism. However, contrary to our hypotheses, direct associations were found for mothers' profiles in the prediction of boys' internalizing and girls' externalizing behaviours, suggesting that other mechanisms are involved. This exploratory study needs replication in larger and representative samples.

### Authors' note

Sylvana M. Côté and Sylvie Berthoz share senior authorship.


### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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### Supplemental material

Supplementary material for this article is available online.

## References

- Achenbach, T. M., Edelbrock, C., & Howell, C. T. (1987). Empirically based assessment of the behavioral/emotional problems of 2- and 3- year-old children. *Journal of Abnormal Child Psychology*, *15*, 629–650. doi:10.1007/BF00917246
- Achenbach, T. M., Ivanova, M. Y., Rescorla, L. A., Turner, L. V., & Althoff, R. R. (2016). Internalizing/Externalizing problems: Review and recommendations for clinical and research applications. *Journal of the American Academy of Child & Adolescent Psychiatry*, *55*, 647–656. doi:10.1016/j.jaac.2016.05.012
- Behar, L. B. (1977). The preschool behavior questionnaire. *Journal of Abnormal Child Psychology*, *5*, 265–275. doi:10.1007/BF00913697
- Birmaher, B., Axelson, D., Monk, K., Kalas, C., Goldstein, B., Hickey, M. B., ... Brent, D. (2009). Lifetime psychiatric disorders in school-aged offspring of parents with bipolar disorder: The Pittsburgh Bipolar Offspring study. *Archives of General Psychiatry*, *66*, 287–296. doi:10.1001/archgenpsychiatry.2008.546
- Bornstein, M. H., Hahn, C.-S., & Haynes, O. M. (2011). Maternal personality, parenting cognitions, and parenting practices. *Developmental Psychology*, *47*, 658–675. doi:10.1037/a0023181
- Dix, T., Gershoff, E. T., Meunier, L. N., & Miller, P. C. (2004). The affective structure of supportive parenting: Depressive symptoms, immediate emotions, and child-oriented motivation. *Developmental Psychology*, *40*, 1212–1227. doi:10.1037/0012-1649.40.6.1212
- Elgar, F. J., Mills, R. S. L., McGrath, P. J., Waschbusch, D. A., & Brownridge, D. A. (2007). Maternal and paternal depressive symptoms and child maladjustment: The mediating role of parental behavior. *Journal of Abnormal Child Psychology*, *35*, 943–955. doi:10.1007/s10802-007-9145-0
- Ellenbogen, M. A., & Hodgins, S. (2004). The impact of high neuroticism in parents on children's psychosocial functioning in a population at high risk for major affective disorder: A family–environmental pathway of intergenerational risk. *Development and Psychopathology*, *16*, 113–136. doi:10.1017/S0954579404044438
- Goodman, S. H., Rouse, M. H., Connell, A. M., Broth, M. R., Hall, C. M., & Heyward, D. (2011). Maternal depression and child psychopathology: A meta-analytic review. *Clinical Child and Family Psychology Review*, *14*, 1–27. doi:10.1007/s10567-010-0080-1
- Hipson, W. E., Gardiner, S. L., Coplan, R. J., & Ooi, L. L. (2017). Maternal agreeableness moderates associations between young children's emotion dysregulation and socioemotional functioning at school. *The Journal of Genetic Psychology*, *178*, 102–107. doi:10.1080/00221325.2016.1269715
- Lovejoy, M. C., Graczyk, P. A., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: A meta-analytic review. *Clinical Psychology Review*, *20*, 561–592.
- Majdandžić, M., Möller, E. L., de Vente, W., Bögels, S. M., & van den Boom, D. C. (2014). Fathers' challenging parenting behavior prevents social anxiety development in their 4-year-old children: A longitudinal observational study. *Journal of Abnormal Child Psychology*, *42*, 301–310. doi:10.1007/s10802-013-9774-4
- Möller, E. L., Nikolić, M., Majdandžić, M., & Bögels, S. M. (2016). Associations between maternal and paternal parenting behaviors, anxiety and its precursors in early childhood: A meta-analysis. *Clinical Psychology Review*, *45*, 17–33. doi:10.1016/j.cpr.2016.03.002
- Muthén, L., & Muthén, B. (1998–2015). *Mplus User's Guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.
- Newton, N. C., Conrod, P. J., Slade, T., Carragher, N., Champion, K. E., Barrett, E. L., ... Teesson, M. (2016). The long-term effectiveness of a selective, personality-targeted prevention program in reducing alcohol use and related harms: A cluster randomized controlled trial. *Journal of Child Psychology and Psychiatry*, *57*, 1056–1065. doi:10.1111/jcpp.12558
- Offord, D. R., Boyle, M. H., & Racine, Y. (1989). Ontario child health study: Correlates of disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, *28*, 856–860. doi:10.1097/00004583-198911000-00008
- Orri, M., Pingault, J.-B., Rouquette, A., Lalanne, C., Falissard, B., Herba, C., ... Berthoz, S. (2017). Identifying affective personality profiles: A Latent Profile Analysis of the affective neuroscience personality scales. *Scientific Reports*, *7*, 4548. doi:10.1038/s41598-017-04738-x
- Orri, M., Rouquette, A., Pingault, J.-B., Barry, C., Herba, C., Côté, S. M., & Berthoz, S. (2016). Longitudinal and sex measurement invariance of the affective neuroscience personality scales. *Assessment*. Advance online publication. doi:10.1177/1073191116656795
- Pahlavan, F., Mouchiroud, C., Zenasni, F., & Panksepp, J. (2008). Validation de l'adaptation française de l'échelle neuro-affective de personnalité [French validation of the Affective Neuroscience Personality Scales (ANPS)]. *Revue Européenne de Psychologie Appliquée/European Review of Applied Psychology*, *58*, 155–163. doi:10.1016/j.erap.2007.08.004
- Panksepp, J. (2005). Affective consciousness: Core emotional feelings in animals and humans. *Consciousness and Cognition*, *14*, 30–80. doi:10.1016/j.concog.2004.10.004
- Panksepp, J. (2006). Emotional endophenotypes in evolutionary psychiatry. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, *30*, 774–784. doi:10.1016/j.pnpb.2006.01.004
- Parent, J., Forehand, R., Pomerantz, H., Peisch, V., & Seehuus, M. (2017). Father participation in child psychopathology research. *Journal of Abnormal Child Psychology*, *45*, 1259–1270. doi:10.1007/s10802-016-0254-5
- Pingault, J.-B., Falissard, B., Côté, S., & Berthoz, S. (2012). A new approach of personality and psychiatric disorders: A short version of the affective neuroscience personality scales. *PLoS ONE*, *7*, e41489. doi:10.1371/journal.pone.0041489
- Pingault, J.-B., Pougat, L., Grèzes, J., & Berthoz, S. (2012). Determination of emotional endophenotypes: A validation of the Affective Neuroscience Personality Scales and further perspectives. *Psychological Assessment*, *24*, 375–385. doi:10.1037/a0025692
- Prinz, P., Onghena, P., Hellinckx, W., Grietens, H., Ghesquière, P., & Colpin, H. (2004). Parent and child personality characteristics as predictors of negative discipline and externalizing problem behaviour in children. *European Journal of Personality*, *18*, 73–102. doi:10.1002/per.501
- Prinz, P., Onghena, P., Hellinckx, W., Grietens, H., Ghesquière, P., & Colpin, H. (2005). Direct and indirect relationships between parental personality and externalising behaviour: The role of negative parenting. *Psychologica Belgica*, *45*, 123–145. doi:10.5334/pb-45-2-123
- Prinz, P., Stams, G. J. J. M., Deković, M., Reijntjes, A. H. A., & Belsky, J. (2009). The relations between parents' Big Five personality factors and parenting: A meta-analytic review. *Journal of Personality and Social Psychology*, *97*, 351–362. doi:10.1037/a0015823

- R Core Team. (2016). R: A language and environment for statistical computing (Version 3.3.0). Vienna, Austria: R Foundation for Statistical Computing. Retrieved from <https://www.R-project.org/>
- Stone, L. L., Mares, S. H. W., Otten, R., Engels, R. C. M. E., & Janssens, J. M. A. M. (2016). The co-development of parenting stress and childhood internalizing and externalizing problems. *Journal of Psychopathology and Behavioral Assessment*, *38*, 76–86. doi:10.1007/s10862-015-9500-3
- Teetsel, R. N., Ginsburg, G. S., & Drake, K. L. (2014). Anxiety-promoting parenting behaviors: A comparison of anxious mothers and fathers. *Child Psychiatry and Human Development*, *45*, 133–142. doi:10.1007/s10578-013-0384-8
- van Aken, C., Junger, M., Verhoeven, M., van Aken, M. A. G., Deković, M., & Denissen, J. J. A. (2007). Parental personality, parenting and toddlers' externalising behaviours. *European Journal of Personality*, *21*, 993–1015. doi:10.1002/per.643