

Behavioural Problems in Children with Headache and Maternal Stress: Is Children's Attachment Security a Protective Factor?

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Headache is a potentially disabling condition involving enduring pain that negatively influences the quality of family life. Behavioural problems are more common in children with headache and are potentially associated with higher levels of parental stress. The aim of this study was to evaluate the extent to which children's behavioural problems were associated with maternal stress and how the child's perception of security in the maternal attachment relationship moderates this association. Seventy-one school-aged children with headache (headache group (HG), age $M=9.8$ years old, $SD=1.3$) and 71 children from a low-risk normative population (control group (CG), age $M=9.2$ years old, $SD=1$) and their mothers were involved in the study. Mothers' reports of children's behavioural problems were associated with higher maternal stress in the caring task both in the HG and in the CG. Results also showed that the HG was more at risk for behavioural problems, whereas no difference between groups was detected for parenting stress and for attachment insecurity. In children with headache, perception of attachment security decreased the strength of the association between maternal stress and externalizing behavioural problems. Secure attachment may provide children with headache and their parents with support in managing the negative emotions that arise in the context of significant health issues. Implications for practice are discussed. Copyright © 2015 John Wiley & Sons, Ltd.

Key words: attachment; behavioural problems; headache; parenting stress

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INTRODUCTION

The term headache refers to head pain and includes tension-type headache, migraine and a combination of both. It is the most common somatic complaint in children (Perquin et al., 2000), and its prevalence increases throughout childhood, with up to 75% of school-age children experiencing headache occasionally and up to 9–10% experiencing headache frequently (Virtanen et al., 2004; Wöber-Bingöl, 2013). The psychopathology of paediatric headache has been extensively explored with some findings including a high prevalence of behavioural problems, anxiety and/or depressive symptoms (Balottin, Fusar-Poli, Termine, Molteni, & Galli, 2013; Pinquart, 2011; Slater et al., 2012), and more stress, somatic concerns, illnesses and unhappy atmosphere in the child-rearing experience reported by parents (Kernick & Campbell, 2009; Liakopoulou-Kairis et al., 2002). Preliminary data also indicate that headache symptoms might be associated with insecure attachment (Berry & Drummond, 2014; Esposito, Gallai et al., 2013). Other findings, however, suggested that these children are not more at risk of psychological dysfunctioning than their peers, and the high rates of internalizing behavioural problems reported by parents may be due to their somatic complaints (Bruijn, Locher, Passchier, Dijkstra, & Arts, 2010).

Our aim was to contribute to clarifying the association between two factors known to be related to paediatric headache, children's behavioural problems and parenting stress (Balottin et al., 2013; Virtanen et al., 2004) and to investigate if the child's perception of the attachment relationship as secure may intervene to buffer this association.

Children's Behavioural Problems and Parenting Stress

Headache in children has been extensively reported to impact on their everyday functioning in significant ways. Several studies indicate that children with headache are more at risk for low-quality emotional functioning, behavioural problems and absenteeism from school (Kernick & Campbell, 2009). Headache not only puts children at risk for maladjustment but can also impede family well-being: primary caregivers are faced with managing the recurrent headache crises of their children as well as the time-consuming recurrent medical examinations that impact on time management.

With regard to parenting stress, in a recent study, Esposito, Marotta, et al. (2013) found that stress related to child-rearing is over-represented in the primary caregivers of children with headache, suggesting a need to extend the assessment and intervention phases to parents as well. As stress is a reference variable in our study, the multidimensional conception of it underpinning the question domains in the Parenting Stress Index – Short Form (PSI/SF) that we employed is worth dwelling on. In 1990, Richard Abidin proposed an articulation of the stress experienced in the caring task into three dimensions: distress pertaining to the parental role, due to personal stresses and the daily time schedule (the Parent Distress domain); the distress related to the perceived quality of the parent–child relationship as difficult to handle and of the child as not responsive to parental expectations (the Parent–Child Dysfunctional interaction domain); and a dimension pertaining to children's behaviour and temperamental features that might make the parenting role easier or more difficult (the Difficult Child domain). A recent study reported that parents of children with headache were found to be at risk for higher stress levels on all of these dimensions (Esposito, Marotta et al., 2013). It remains to be ascertained

whether it is the children's social-emotional adaptation and behavioural problems or other emotional and family-based variables, such as the perceived quality of attachment relationships, that weigh more heavily in determining this perception of stress.

Studies involving parents of children with developmental delays or who came from various at-risk situations found that higher levels of primary caregiver stress were influenced by the severity of children's behavioural problems (Davis & Carter, 2008; Taylor-Richardson, Heflinger, & Brown, 2006). In particular, externalizing problem behaviours were the factor found to result in the least-supportive parenting, most negative discipline practices and most parenting stress (Jansen et al., 2012). In turn, parenting stress has been found to increase the risk for subsequent problems in the emotional and behavioural adjustment of the child (Tharner et al., 2012), and there may exist a sort of vicious cycle effect (Neece, Green, & Baker, 2012). Thus, investigating the mechanisms behind the influence of children's behavioural problems on the primary caregiver's stress might supply a starting point for developing strategies to support this paediatric population and its families.

Does Attachment Moderate the Association Between Problem Behaviours and Maternal Stress in Child-rearing?

Attachment theory (Bowlby, 1969; Cassidy & Shaver, 2008) offers a well-suited framework within which to investigate what might promote or hamper family adjustment in both at-risk and normative contexts, departing as it does from a family-based perspective to simultaneously detect parenting protective and risk factors, and children's social-emotional adjustment (Barone & Lionetti, 2012a; Cozolino, 2014). It also provides a basis for promoting the quality of infant mental health with *ad hoc* programs to sustain the family and prevent the child's long-term maladjustment (Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2008). From an attachment perspective, any step that we take to promote the child's well-being has to take into consideration his or her family as well. One of the central points of attachment theory regard the way children cope with threats and challenges if sustained by the consistent, responsive and sensitive support of caregivers. Research data suggest that the experience of a supportive relationship (namely, the sensitive presence of a primary caregiver, i.e. the person who mostly looks after the child) and perception of parental availability may promote positive psychological outcomes in children even when faced with adversities and difficulties and may influence how people manage painful physical experiences and health problems (Ciechanowski, Sullivan, Jensen, Romano, & Summers, 2003). Simultaneously, secure and organized attachment may protect parents from experiencing high levels of stress in the child-rearing (Lionetti, Pastore, & Barone, 2015).

Most research so far on attachment in children suffering from headache has been comparative, aimed at investigating differences between low-risk and high-risk groups. Results reported so far are mixed: Esposito, Parisi et al. (2013) identified higher rates of insecure-avoidant attachment in a sample of school-aged children with headache; conversely, Berry and Drummond (2014) reported an association between headache and the degree of self-reported insecure-ambivalent/pre-occupied attachment, in a study conducted on undergraduate students. Given these conflicting data, the obvious next step is to analyse *how* variables interact with one another in influencing the quality of adjustment.

The investigation of whether attachment moderates the association between problem behaviours in children with headache and stress in their primary caregivers seems a worthwhile enterprise, as it may help clarify the so far controversial

findings obtained by a purely comparative approach and lead to ways to increase the well-being of the whole family by preventing the potential behaviour–stress maladaptive association. Parenting stress is thought to have a relevant negative effect on the quality of caregiving, increasing intrusiveness and/or leading to insensitive care (Tharner et al., 2012; Jansen et al., 2012), a problem associated with disorganized representations of attachment relationships in parents (Lionetti et al., 2015). It is also likely that the absence of a supportive parent–child relationship may actually increase the risk of somatic complaints (e.g. headache or stomach ache), as the child might not get enough help to manage negative feelings (Hagekull & Bohlin, 2004).

The aim of the current study was to contribute to understanding the factors that can impair family functioning when it is challenged by children's health conditions such as headache. We investigated the following in a group of children suffering from headache together with their mothers (headache group (HG)) and on a matched group belonging to a low-risk normative population (control group (CG)):

1. The presence and degree of children's behavioural problems, attachment security and maternal stress;
2. The association between children's behavioural problems and maternal stress;
3. Whether children's perceived attachment security would be associated with a decrease in the strength of the relationship between children's behavioural problems and maternal stress in the caring task, that is, whether it can be hypothesized to play a protective role.

Specifically, our hypotheses were that

1. Problem behaviours in children and maternal stress in the caring task would be over-represented in the headache group, while attachment security would be underrepresented;
2. Children's problem behaviours would be associated with higher maternal stress in both groups;
3. Secure attachment would be a protective factor in both groups, attenuating the association between mothers' perceived stress in the caring task and children's problem behaviours.

METHOD

Participants

Headache group (HG)

Eighty-two children suffering from headache and their mothers were consecutively enrolled over a period of 2 years, at a third-level Child and Adolescent Headache Centre. Exclusion criteria were as follows: immigrants with language difficulties, children with incomplete and/or unclear reported clinical history with regard to headache (because of its confusing effect on the diagnosis reliability), single parenthood (because this could have increased parenting stress representing an uncontrolled variable), co-morbidity with other chronic organic conditions (e.g. epilepsy; because this could have increased children's behavioural problems), and psychological therapies before first consultation (because this could have a buffering impact, protecting against stress). Eighty-seven percent of families agreed to participate, resulting in a sample of 71 children ($n = 33$ male) aged 7 to

12 years old ($M=9.8$, $SD=1.3$) and their mothers. Mothers were assumed to be the primary caregiver because of their central involvement in the daily care of the child at home. Thirty-three patients presented with migraine, 27 with tension-type headache and 11 with a mixed pattern of migraine and tension-type headache. All mothers and their children were interviewed on headache symptoms and characteristics during the first examination by the aid of a semi-structured questionnaire to allow diagnoses according to the International Classification of Headache Disorders–2nd Edition (2004). Other data (e.g. age and socio-economic status) were obtained from medical records. Age at headache onset ranged from 4 to 11 years old ($M=8.2$, $SD=1.7$). The number of attacks per week, collected by interviewing parents and children and evaluated by means of an index created following the International Classification of Headache Disorders, was about three ($M=3.22$, $SD=1.22$). No gender differences were detected ($t(67.55)=0.13$, $p=.89$). The distribution of mothers' educational level was as follows: 17% university degree; 51% secondary education; and 32% primary education. The majority of them (70%) had a permanent employment position.

Control group (CG)

Seventy-one children ($n=39$ male) with an age range of 7 to 11 years old ($M=9.2$, $SD=0.97$), comparable with that of the HG, and their mothers were enrolled into the study from a local school. Children with headache ($n=2$) or recurrent pain symptoms (i.e. abdominal pain) were excluded. The distribution of mothers' educational level was as follows: 21% university degree, 59% secondary education, and 20% primary education. Similar to the HG, the majority of mothers (77%) had a permanent employment position.

Measures

Children's behavioural problems

The validated Italian version of the Child Behavior Check List (CBCL) (Achenbach & Rescorla, 2001; Frigerio, 2001) for school-aged children was used to assess behavioural problems. The CBCL was developed to obtain parental reports on children's behavioural and emotional problems. Scores for different questions are summed according to problem behaviour, and these are then assigned to one of two broad score categories: externalizing or internalizing. Parents were asked to indicate if a problem was *not* (0), *sometimes* (1), or *often* (2) true for their child.

Parenting stress

The standardized Italian version of the self-report Parenting Stress Index – Short Form (PSI/SF) (Abidin, 1990; Guarino, Di Blasio, D'Alessio, Camisasca, & Serantoni, 2008) was used to investigate stress perceived in child-rearing. Parents were asked to indicate the extent of their agreement or disagreement with statements about their level of stress, the parent–child relationship and child characteristics such as 'difficult to manage'. The PSI yields scores on a 5-point Likert scale for 12 questions in each of three domains: the parent distress domain (PD, reflecting the perception of stress due to being a parent), the parent–child dysfunctional interaction domain (PCD, reflecting the lack of parental satisfaction with parent–child interactions and the parent's perception of the relationship as difficult to handle), and difficult child domain (DC, reflecting the parental perception of a child as having a difficult temperament). The instrument also has a defensive response scale on which scores of

10 or less result in the questionnaire being invalid. In the current study, the reliability scores along PSI dimensions were satisfactory, and, specifically, greater lowest bound (glb, Bentler, 2009) values in the current study were as follows: glb = .90 on PD, glb = .90 on PCD, glb = .91 on DC.

Attachment

The Italian version of the Security Scale (Calvo, 2008; Kerns, Keplac, & Cole, 1996) was used to investigate children's attachment towards the primary caregiver. The scale consists of 15 items that measure the degree to which children perceive an attachment figure as responsive and available, their tendency to rely on the attachment figure in times of stress and their ease of and interest in communication with the attachment figure. It might thus offer a privileged perspective for investigating the child with headache's perception of his or her parent as sensitive and accessible in case of need. Higher scores on this measure reflect perceptions of greater perceived attachment security. Reliability score was satisfactory, that is, glb = .81.

Procedures

The study was approved by the ethical committee of the hospital where the research was conducted. Clinical and anamnestic data of interest were obtained by consulting medical reports. Mothers filled in the PSI questionnaire 6 months after having completed the CBCL. The Security Scale was administered to the children in an individual laboratory session. In order to ensure that the children understood the questions, each item was read aloud to them.

Analytic Plan

In order to test the first hypothesis, that is, whether children's behavioural problems and parenting stress were over-represented and attachment security under-represented among children with headache, we computed the association between group condition and each of the investigated variables. Moving on to our second hypothesis, the association between children's problem behaviours and parenting stress was analysed by using regression analyses. Both CBCL scales—internalizing and externalizing—and all three PSI domains, that is, Parent Distress, Parent–Child Dysfunctional Interaction and Difficult Child, were considered. Finally, we tested the moderating role of attachment security, as perceived by the child, adding it as an interaction term in the regression models. The Bayesian information criterion (BIC) and the variance explained (R^2) were used to compare (Schwarz, 1978; see also Cumming, 2014) a model that included the moderating role of attachment with another that did not. Interaction effects were explored graphically using the *effect* package (Fox, 2003) in the statistical software R (R, 2013).

RESULTS

Children's Behavioural Problems, Parenting Stress and Attachment Security

Twelve mothers (17%) from the headache group and seven (10%) from the control group were excluded from analyses because of their defensive scores, which led to an invalid PSI. The final sample included 123 children and their mothers ($n = 59$ headache group; $n = 64$ control group). Means and standard deviations for control

and headache groups are reported in Table 1. Bivariate correlations were interpreted according to their effect size values (Cumming, 2014). As reported in Table 1, all but one of the associations between group condition, parenting stress, behavioural problems and attachment security were trivial: mothers of the HG rated their children as presenting more internalizing behavioural problems than mothers belonging to the CG condition, with a medium effect size ($r_{pb} = .35$, Table 1, $N = 123$). The two groups did not differ in terms of attachment security and parental stress.

Table 2 shows bivariate associations between maternal stress, behavioural prob-T2 lems and attachment security variables. A high correlation was found between internalizing and externalizing behavioural problems in the CG (i.e. $r(62) = .69$), whereas in the HG it was lower ($r(57) = .29$). Interestingly, the only association of relevance between attachment and parenting stress was detected in the HG for the PCD, with a negative correlation between the two variables and a medium

Table 1. Parenting stress (PSI), children’s behavioural problems (CBCL) and attachment: descriptive values and association with group condition

	HG ($n = 59$) <i>M (SD)</i>	CG ($n = 64$) <i>M (SD)</i>	$r_{pb}(121)^*$ (CG = 0; HG = 1)
Externalizing behavioural problems (CBCL)	6.73 (5.64)	5.23 (5.22)	.14
Internalizing behavioural problems (CBCL)	12.38 (7.79)	7.06 (6.71)	.35**
Parent domain (PSI)	26.49 (5.37)	26.94 (6.61)	-.04
Parent-child dysfunctional interaction (PSI)	23.81 (5.49)	22.56 (6.05)	.10
Difficult child (PSI)	27.63 (8.07)	25.61 (6.59)	.14
Attachment security	3.25 (0.38)	3.15 (0.47)	.13

** $p < .001$
PSI, Parenting Stress Index; CBCL, Child Behavior Check List; HG, headache group; CG, control group.

Table 2. Bivariate correlations between children’s behavioural problems, attachment security and parenting stress in the children with headache group (in bold, $n = 59$) and in the control group ($n = 64$)

	1	2	3	4	5	6	7	8
1. Externalizing behavioural problems		.29*	.29*	.37*	.55**	-.03	-.02	.31*
2. Internalizing behavioural problems	.67**		.37*	.34*	.43**	-.03	-.06	.24
3. Parent distress	.08	.35*		.58**	.62**	-.23	-.02	.20
4. Parent-child dysfunctional interaction	.47**	.41**	.44**		.67*	-.32*	-.04	.01
5. Difficult child	.64**	.45**	.36*	.54**		-.20	.10	.17
6. Attachment security	-.11	.02	-.01	-.20	-.02		-.22	.16
7. Children’s age in months	-.08	.02	.24	-.08	-.10	.08		.20
8. Gender (1 = male; 0 = female)	.11	.05	.03	.28*	.09	-.21	-.20	

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

effect size ($r(57) = -.32$). Both in the control group and in the headache group, the associations between parenting stress dimensions and children's behavioural problems were of a moderate effect size except for the trivial correlation between PD stress dimension and externalizing behavioural problem in the CG (Table 2).

The Relationship Between Children's Behavioural Problems and Parenting Stress

Next, we investigated the association between internalizing and externalizing behavioural problems in children and maternal stress in the PSI dimensions, using regression analysis models. Results, reported in Table 3, showed that, irrespective of group, behavioural problems were associated with higher maternal stress. Specifically, (i) externalizing behavioural problems were associated with high levels of stress in the DC domain, pertaining to the perception of the child as difficult to handle (respectively, $B(SE) = 0.76(0.17)$, $p < .001$ in the CG and $B(SE) = 0.67(0.16)$, $p < .001$ in the HG) and in the PCD domain, pertaining to the relationship with the child perceived as dysfunctional and problematic (respectively, $B(SE) = 0.38(0.17)$, $p = .03$ in the CG and $B(SE) = 0.29(0.12)$, $p = .02$ in the HG); (ii) internalizing behavioural problems were linked to higher levels of stress in the parent domain, reflecting the perception of stress due to being a parent (PD, respectively, $B(SE) = 0.53(0.15)$, $p < .001$ in the CG and $B(SE) = 0.20(0.08)$, $p = .02$ in the HG). The only significant association observed specifically for the HG but not for the CG was between internalizing behavioural problems and stress in mothers in the PCD and DC domains. Specifically, in the HG, both internalizing and externalizing behavioural problems in children were associated with maternal stress in the PCD and DC domains, whereas in the CG, this was only for externalizing behavioural problems.

Table 3. Regression analyses: externalizing and internalizing behavioural problems on parenting stress domains

	Control group ($n = 64$)				Children with headache group ($n = 59$)			
	$B(SE)$	p	R^2	BIC	$B(SE)$	p	R^2	BIC
DV: parent distress								
Externalizing behavioural problems	−0.36 (0.20)	.08	.17	427.37	0.27 (0.12)	.03	.21	367.15
Internalizing behavioural problems	0.53 (0.15)	<.001			0.20 (0.08)	.02		
DV: parent–child dysfunctional interaction								
Externalizing behavioural problems	0.38 (0.17)	.03	.25	409.65	0.29 (0.12)	.02	.20	370.76
Internalizing behavioural problems	0.19 (0.13)	.17			0.17 (0.09)	.05		
DV: difficult child								
Externalizing behavioural problems	0.76 (0.17)	<.001	.40	405.08	0.67 (0.16)	<.001	.38	400.87
Internalizing behavioural problems	0.05 (0.13)	.70			0.30 (0.11)	.01		

The Moderating Role of Attachment Security

To find out whether attachment would moderate the link between children's behavioural problems and parenting stress, it was included as an interaction term in the regression analyses. Results (Table 4) showed a moderating role of attachment only for the HG, meaning that it was especially for the child with headache that perceived security in the attachment relationship with the mother was associated with weaker links between stress in caring and behavioural problems, and that this was mainly true for externalizing problems. The moderation effect was evident according to both the more traditional null hypothesis significance testing approach ($p = .03$, see Table 4) and the BIC (from 370.76, Table 3, to BIC = 396.36, Table 4), suggesting a better fit of the model when the interaction term was included. A graphical representation (Fox, 2003) was used to interpret the interaction effect and further verify this result. The three boxes in Figure 1 show the association between children's externalizing behavioural problems and maternal stress,

Table 4. Regression analyses: the moderating role of attachment

	Control group ($n = 64$)				Children with headache group ($n = 59$)			
	B (SE)	p	R^2	BIC	B (SE)	p	R^2	BIC
DV: parent distress								
Externalizing behavioural problems	.84 (1.43)	.56			2.86 (2.07)	.17		
Internalizing behavioural problems	.77 (.97)	.43			-1.65 (1.07)	.13		
Attachment security (AS)	2.31 (2.78)	.41			-5.74 (3.36)	.09		
Externalizing behavioural problems \times AS	-.038 (.44)	.39			-.078 (.62)	.22		
Internalizing behavioural problems \times AS	-.008 (.30)	.78	.19	437.70	0.55 (.32)	.09	.30	372.49
DV: parent-child dysfunctional interaction								
Externalizing behavioural problems	0.68 (1.20)	.57			4.88 (2.01)	.02		
Internalizing behavioural problems	1.14 (0.82)	.17			-0.69 (1.03)	.51		
Attachment security	0.79 (2.35)	.74			-0.62 (3.28)	.85		
Externalizing behavioural problems \times AS	-.012 (.38)	.77			-1.39 (0.61)	.03		
Internalizing behavioural problems \times AS	-0.30 (0.25)	0.24	.32	416.09	0.25 (0.31)	.42	.36	369.36
DV: difficult child								
Externalizing behavioural problems	2.84 (1.18)	.02	.45	413.06	1.32 (2.84)	.64	.41	409.81
Internalizing behavioural problems	-1.44 (.79)	.08			0.02 (1.46)	.98		
Attachment security (AS)	.76 (2.29)	.74			-3.85 (4.62)	.41		
Externalizing behavioural problems \times AS	-.064 (.36)	.08			-0.20 (0.86)	.82		
Internalizing behavioural problems \times AS	0.46 (0.25)	.07			0.08 (0.44)	.85		

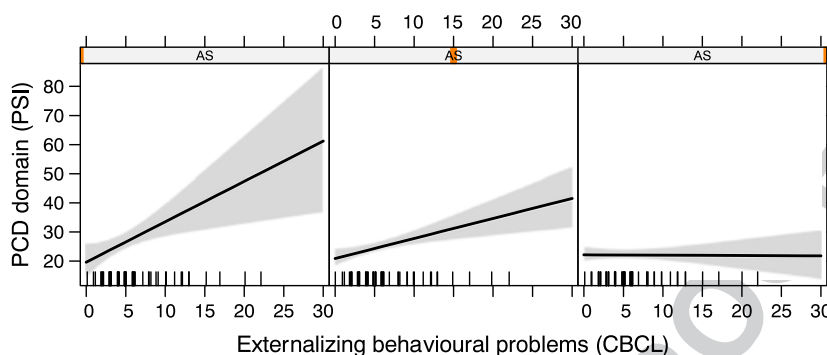


Figure 1. The three boxes represent the association between stress in mothers (parent–child dysfunctional interaction domain (PCD)) and externalizing behavioural problems (Child Behavior Check List (CBCL)) in children, depending on increased levels of attachment security (AS): 2.5, 3 and 3.5 in box 1, 2 and 3, respectively. The gray area around the estimated effect represents 95% confidence interval. Lines on the horizontal axis display the distribution of where the data are located.

moderated by different levels of attachment security (respectively, 2.5, 3 and 3.5 in the three boxes). Given that attachment security increases from the left to the right box, it is evident that the higher the attachment security, the lower the association between maternal stress and children's behavioural problems.

DISCUSSION AND CONCLUSION

Headache is a potentially disabling condition for children and their parents; it involves high levels of behavioural problems that in turn increase the risk of parental stress. Our study was designed to explore the possible role of child's attachment security perception in moderating the negative and possibly reciprocal association between behavioural problems and parental stress, trying to overcome a purely comparative approach (headache children vs. normative ones) in favour of the analysis of mechanisms involved in the troubled association. Results showed that the link between behavioural problems and maternal stress was true both for children with and without headache; of most relevance was that for the former, the perceived attachment security was associated with weaker links between maternal stress and externalizing behavioural problems, suggesting that secure attachment may be a protective factor in managing painful and negative emotions involved in health issues.

The descriptive data obtained sustain the main findings of previous comparative studies by confirming a higher level of behavioural problems in children with headache (Balottin et al., 2013). At the same time, they diverge from other studies reporting higher parental stress in this population (Esposito, Gallai et al., 2013), suggesting that further research is needed to reach a more reliable and definitive conclusion on these sparse data. Overcoming these still open issues and looking beyond a purely comparative approach we can state, considering the regression analyses performed, that maternal stress and behavioural problems are linked to one another, irrespective of the presence of a headache potentially disabling condition; having such a condition does not actually seem to add anything more to this already empirically well and broadly confirmed association.

What is new in our approach is the consideration of the moderating role of attachment security, where we found that this variable, although not different in its values in the two groups of children, is nevertheless able to play a different role in each of them. Interestingly, attachment security appears to have its major effect in the more impaired families, that is, those with a child with headache, whereas it does not seem to play the same role in normative families. The perceived attachment security was associated with weaker links between externalizing behaviour problems and the maternal perception of the parent–child interaction as being the main source of stress. We can thus hypothesize that this may reduce in the long term what has been called the risk of a vicious cycle effect (Neece et al., 2012), at least for the externalizing dimension of problem behaviours. Longitudinal studies are needed to further support this hypothesis; it is interesting that these findings are in line with studies on normative samples in which the interplay between attachment and behavioural problems has been reported mainly for externalizing problems (Fearon & Belsky, 2011), and they suggest that attachment may act as a buffer in emotionally challenging contexts like that of recurrent pain.

The effect that we found for attachment suggests that it is indeed the relational quality in mother–child interactions that could act as a protective factor against the association between stress and problem behaviours, especially in a situation which would activate attachment, that is, the need for comfort and protection, in children. If the attachment system, in the form of supportive relationships, is indeed able to regulate negative emotions, our investigation suggests a direction in which to concentrate troubleshooting efforts in families where functioning is challenged by the child with a chronic health issue.

Further studies should be conducted with populations affected by different kinds of functional (recurrent or chronic) pain. According to Hagekull and Bohlin (2004), the lack of a supportive parent–child relationship may increase the risk of developing psychosomatic problems (headache or abdominal pain). The behavioural profile (measured by CBCL) and psychopathological characteristics of children with headache are akin to those of recurrent abdominal pain (Feldman, Ortega, Koinis-Mitchell, Kuo, & Canino, 2010) and to that of patients with other chronic pain (Cunningham et al., 1987). This is to say that interventions focusing on managing negative emotions and fostering secure attachment relationship may concern other kinds of pain as well. The replication of the present study in other contexts dealing with different kinds of functional pain in children may offer interesting clues to clarify the specificity (or not) of our findings for headache population.

The implementation of early programs of intervention is extremely important in managing headache in childhood. We know that headache with onset in childhood shows the worst outcome when associated with psychopathological disorders and is at risk of a chronic evolution (Galli et al., 2004; Seshia, 2012; Arita et al., 2013). To date, we do not know which is the explanation of the association between headache and emotional and/or behavioural disorders. Security of attachment not only represents a lever for treatment interventions in the direction of breaking the cycle of psychological disorders and headache but also a way to answer the several questions arising from such association.

Before concluding, the main limitations of the study need to be mentioned, as they also suggest future directions for the research in this field. These are the absence of data regarding fathers, the cross-sectional nature of data collection and a single informant for both parenting stress and children's behavioural problems. Studies including fathers are needed to further clarify the mechanisms involved in family adjustment (Barone & Lionetti, 2012b; Boldt, Kochanska, Yoon, & Nordling, 2014; Lionetti et al., 2015); additionally, multi-informant procedures would reduce

the bias due to having a single informant on stress and behavioural problems. The strength of our work was in taking into account not only risk factors (stress and behavioural problems) but also considering a potentially protective one (attachment security) in the study of family adjustment.

To conclude, we hope that our data will add a contribution to a field where the understanding of the mechanisms involved in the functioning of families of children with chronic health problems like headache is still scarce. They suggest that it may be possible to promote positive family adjustment in populations like ours by fostering a secure relationship in which parents are perceived as accessible and able to sustain the child with headache in managing negative emotions. The attachment relationship is a possible keystone in the development of therapeutic program with these objectives.

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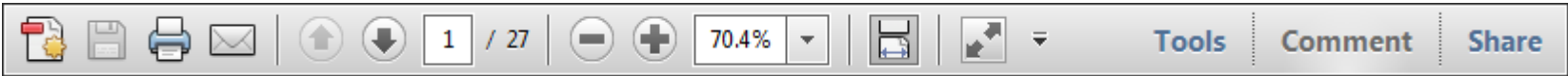
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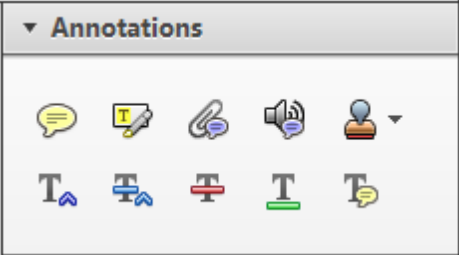
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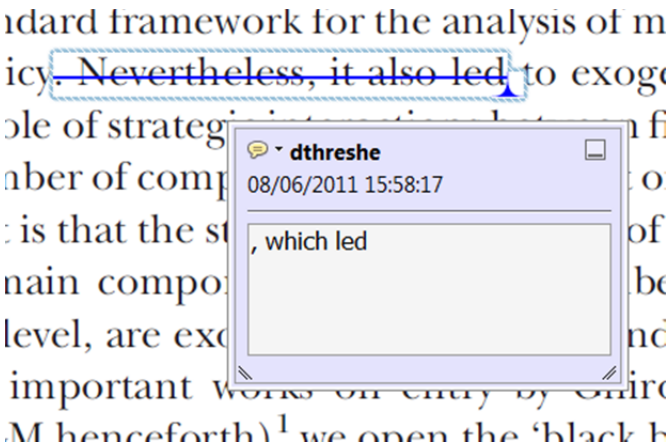
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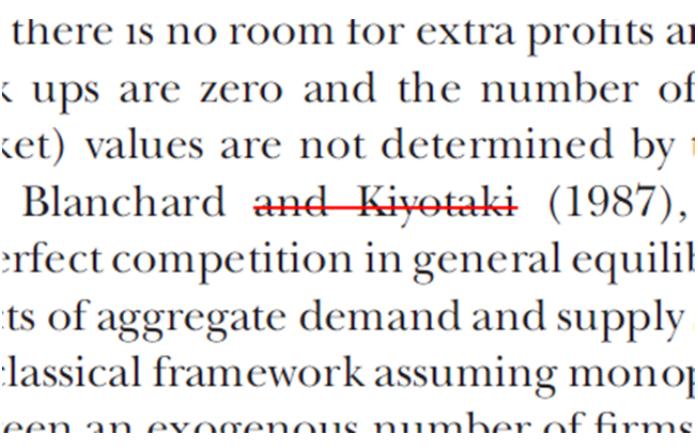
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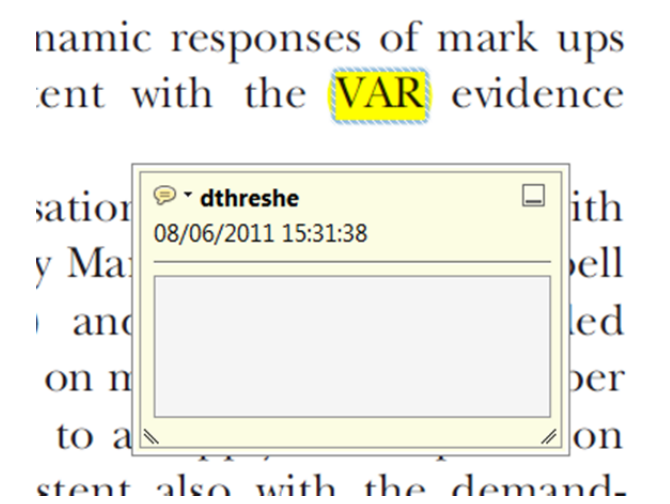
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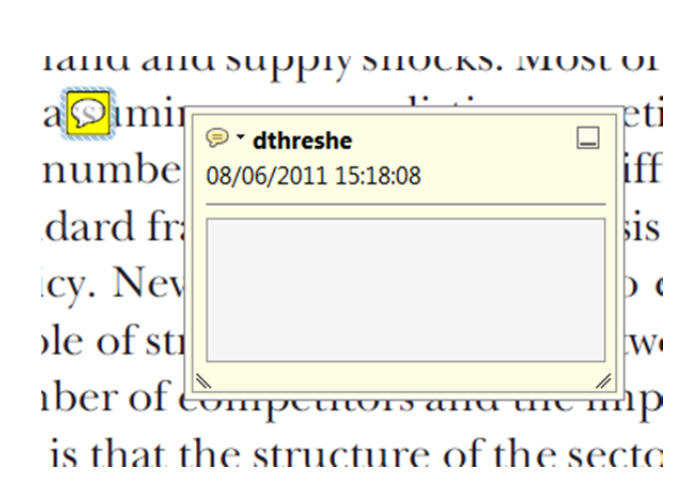
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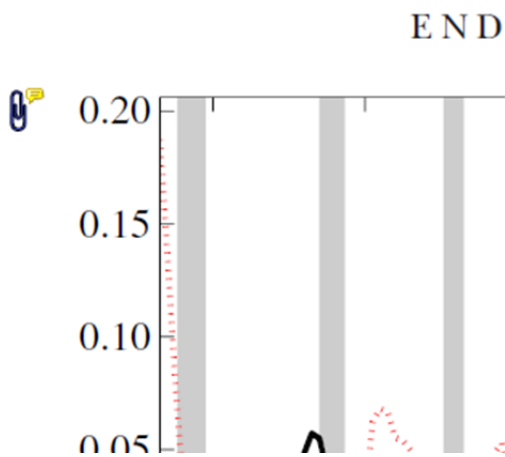


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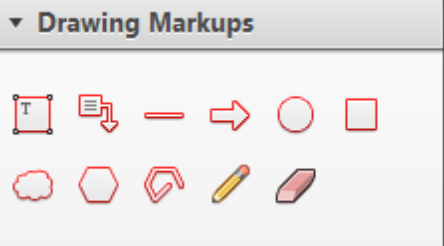
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of the business cycle, starting with the
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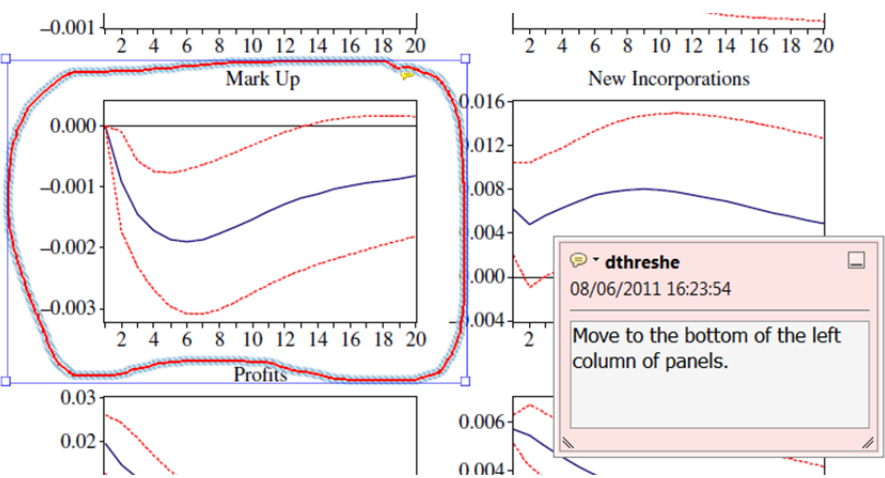


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