



Punitive Parenting Style and Psychological Problems in Childhood: The Moderating Role of Warmth and Temperament

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Abstract

Punitive parenting style has been identified as a risk factor for the development of internalizing and externalizing problems in childhood. However, its effect might depend on child temperament and the combined use of punishment with other parenting forms such as warmth. This longitudinal study assessed whether three temperament traits (negative affectivity, positive affectivity, and effortful control), as well as parental warmth moderated the association between punishment and child internalizing and externalizing problems. Five-hundred and seventy-two children (mean age at wave 1: 8.47 years; 45% girls) and their parents participated in the two waves (8 month apart) of the study. Children completed measures of depression, somatization, rule breaking, aggressive behavior, and parenting styles. Parents completed measures assessing their children's temperament traits (negative affectivity, positive affectivity, and effortful control) and problems. Punishment predicted an increase in all problems over time. Parental warmth predicted a decrease in depression and somatization. Positive affectivity predicted an increase of aggressive behavior. Negative affectivity moderated the predictive association between punishment and externalizing symptoms, with the detrimental effect of punishment being higher among children high in negative affectivity. In addition, the damaging role of punishment on depression was higher when both warmth and effortful control were high. In boys, punishment predicted higher depression when both warmth and negative affectivity were higher. Results suggest that punishment is uniquely associated with an increase in externalizing and internalizing problems, even though some interactions between temperament, warmth and punishment can exacerbate or diminish direct associations between punishment and children's psychological symptoms.

Keywords Punitive parenting style · Warmth · Temperament · Externalizing problems · Internalizing problems.

The influence of parenting styles in psychological wellbeing in childhood has long been an object of study (e.g., Flouri and Midouhas 2017; Gilliom and Shaw 2004; McKee et al. 2007). Punitive parenting style (“punishment” from now on) is characterized by rigid rules, verbal and physical hostility, and high penalization of errors among other features (Baumrind 1996; Robinson et al. 1995). Punishment has been positively associated with externalizing and internalizing problems in several longitudinal studies (e.g., Flouri and Midouhas 2017; MacKenzie et al. 2012;

McLoyd and Smith 2002; Pinquart 2017). However, its effect might depend on child temperament and the combined use of punishment with other parenting forms such as warmth.

Regarding the latter, warm parenting style (“warmth”, from now on) is characterized by a high level of positive affect, dedication and warmth, as well as closeness to the child (Baumrind 1996; Kiff et al. 2011; Robinson et al. 1995). It has been negatively associated with internalizing and externalizing problems and positively associated with social competence and adjustment in both cross-sectional and longitudinal studies (e.g., Hipwell et al. 2008; Stormshak et al. 2000; Williams et al. 2009).

A few studies have examined whether warmth can buffer the negative effects of punishment on psychological adjustment, yielding mixed results. Some findings suggest that warmth buffers against the detrimental influence of punishment (e.g., Deater-Deckard et al. 2006; Germán et al. 2013). For example, McLoyd and Smith (2002), in a 6 year

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longitudinal study of children aged 4–11, found that spanking predicted an increase in children behavior problems when mothers' warmth and support levels were low, but not when warmth and support were high. In another study, warmth buffered the impact of harsh parental physical discipline on child internalizing and externalizing problems cross-sectionally in a sample of 5th and 6th grade students (McKee et al. 2007). In contrast, other studies have found that warmth does not moderate the associations between punishment and child externalizing and internalizing problems (e.g., Del Hoyo-Bilbao et al. 2018; MacKenzie et al. 2012). For example, Wang and Kenny (2013, 2014) found that parental warmth failed to moderate the longitudinal relationship between highly punitive parenting and child internalizing and externalizing problems.

Moreover, there is some preliminary evidence suggesting that the presence of co-occurring parental punishment and warmth may contribute to increases in internalizing problems such as anxiety. In a longitudinal study (Lansford et al. 2014), with 7- to 10-year-old children and their mothers across eight countries, punishment predicted increases in anxiety and aggression over time, and maternal warmth was related to decreases in these symptoms. In addition, anxiety increased over time in cases in which both high punishment and high warmth were present, whereas when punishment was high and warmth was low, anxiety decreased over time. In this study, warmth did not moderate the relation between punishment and change in aggression. Anonas and Alampay (2015) found a similar pattern regarding verbal punishment as high maternal warmth increased the detrimental effect of high verbal punishment on internalizing and externalizing behaviors. Moreover, in another longitudinal study with children and their parents, a combination of low punishment and high warmth led to a decrease in psychological problems, whereas the combination of elevated warmth and elevated punishment predicted behavior problems (Danzig et al. 2015).

In addition to parenting, other factors such as temperament may be relevant when predicting psychological problems. There is increasing evidence for associations between temperament and both internalizing and externalizing behavioral problems over time (Kiff et al. 2011; Rothbart 2007). Recent research in the field of childhood psychopathology has focused on three central dimensions of temperament (Rothbart 2007; Rothbart and Bates 2006): Effortful control (EC), described as base self-regulation; negative affectivity (NA), characterized by emotions such as fear, anger, sadness, shame and, in general, other unpleasant emotions (Putnam et al. 2008); and positive affectivity (PA), which includes positive mood states, extraversion and reward-seeking approach to novelty (Rothbart 2011; Rothbart and Bates 2006). EC has been associated with less internalizing and externalizing

problems. Low levels of EC and high levels of NA have been found to be related to both internalizing and externalizing problems (e.g., Eisenberg et al. 2009; Rothbart and Bates 2006). Regarding PA, it has been related with less internalizing and more externalizing symptoms (e.g., Berdan et al. 2008; Wang and Saudino 2015). Even if it has been found to be related with subjective well-being, satisfaction and social outgoing (Lyubomirsky et al. 2005; Salovey et al. 2000), PA is also related with anger and aggression proneness (Rothbart and Bates 2006; Rothbart et al. 2000; Stifter et al. 2008).

It has been proposed that underlying temperament influences children's sensitivity to positive (e.g., warmth) and negative (e.g., punishment) features of parenting, which, in turn, influences how children perceive a situation as well as their subsequent affective and behavior responses (Bates and Pettit 2007; Bates et al. 2012; Rothbart 2007; Rothbart and Bates 2006). Studies examining the interaction of parental punishment and child temperament in predicting child outcomes have focused on EC and NA. Thus, EC has been proposed to moderate the adverse effect of negative parenting. It has been suggested that higher EC helps achieving emotion regulation, mainly through effortful management of attention, when facing threatening or negative situations (e.g., Eisenberg et al. 2000; Salmon and Pereira 2002). It appears to be protective against the adverse effects of risk- and stressful contexts, including negative parenting (Lengua 2008; Lengua et al. 2008). Some studies show that negative parenting conducts are particularly detrimental for children low in EC (e.g., Lengua 2008; Morris et al. 2002). Muhtadie et al. (2013), for example, demonstrated an interaction between authoritarian parenting and EC in the prediction of both internalizing and externalizing problems. In children with low levels of EC, authoritarian parenting predicted higher levels of both internalizing and externalizing problems but high EC did not predict higher levels of problems. A similar pattern was found by Morris et al. (2002) for externalizing problems, where low EC increased the risk for problems in the presence of negative parenting and children with high EC seemed more resistant to its deleterious effects.

Regarding NA, evidence suggests that NA may indeed function as a moderator in the relation between punishment and child internalizing and externalizing symptoms (Rothbart and Bates 2006; Van Aken et al. 2007). For instance, Edwards and Hans (2015) found that hostile parenting style augmented the risk for having both internalizing and externalizing problems for those children with a higher level of anger/frustration, a core component of NA. Morris et al. (2002), as well, found that hostile parenting was associated with more externalizing problems among children high on NA. Covert hostility was also related with internalizing problems among these children.

The potential role of PA as moderator of punishment remains unknown. However, it has been proposed that children high in PA are more sensitive to reward and, thus, when they are exposed to limitations in access to positive reinforcers, they may experience anger and frustration and increase risk of aggression (Stifter et al. 2008; Zentner and Bates 2008).

The role of temperament and parenting could be different for boys and girls. Several studies have indicated that girls tend to experience more internalizing symptoms, whereas boys tend to experience more externalizing problems (e.g., Bongers et al. 2003; Keiley et al. 2003; Kiff et al. 2011). In a meta-analysis conducted by Rothbaum and Weisz (1994), some characteristics of parenting, including harsh, threatening, coercion, and restrictiveness, more strongly predicted externalizing problems among preadolescent boys than among preadolescent girls. However, all the studies included in the meta-analysis were cross-sectional, so that can differ in important ways from sex-differences present in longitudinal studies.

Longitudinal research on sex differences in the relationships between parenting, temperament and psychological problems is scarce and overall indicates that these relationships are similar for both boys and girls. For instance, Muhtadie et al. (2013) did not find significant sex differences in the interaction between temperament (NA and EC) and authoritarian parenting style when predicting internalizing problems in children. In their study, Parent et al. (2011) did not find sex differences for the associations between punishment and externalizing problems. Similarly, Stormshak et al. (2000) found that sex did not moderate the association between punishment and child externalizing problems. Others, too, found no moderation effect of sex in the interactional relations between warmth, punishment and temperament for internalizing and externalizing symptoms (Del Hoyo-Bilbao et al. 2018; Lansford et al. 2014; McKee et al. 2007).

Based on the above review, the aim of this study was to examine the role of punishment in the development of internalizing and externalizing problems in childhood and evaluate whether parental warmth and three child temperament traits (NA, PA, and EC) moderate the predictive association between parental punishment and child internalizing and externalizing problems. We hypothesized the following: (1) punishment would predict higher rates of child internalizing and externalizing problems, (2) parental warmth would predict fewer problems, (3) NA would increase the predictive association between punishment and psychological problems, (4) PA would reduce the relationship between punishment and internalizing problems, whereas it would intensify the association for externalizing problems, (5) EC would moderate the link between punishment and child psychological problems, and (6) girls

would score higher on internalizing problems, whereas boys would score higher on externalizing problems and the associations between variables would be similar for boys and girls.

Method

Participants

The initial sample consisted of 1148 children (565 girls, 623 boys, 5 did not indicate sex) between 6 and 10 years of age ($M = 8.47$, $SD = 0.60$). Participants were children from 16 primary schools in Bizkaia and Gipuzkoa, and their parents. Schools were randomly selected and included both private and public schools. 1064 children from the initial sample completed measures at both Time 1 (T1) and Time 2 (T2), spaced 8 months apart (92.7% retention). At T2, mean age was 9.14 years ($SD = 0.60$; age range: 7–11). A total of 572 parents (81.8% mothers) completed parent-report measures about their children. Parents were between 25 and 55 years old (mean age = 41.45, $SD = 4.05$). Since parental measures were required for this study, the final sample consisted of those 572 children (262 girls, 308 boys) whose parents completed measures. Most of participants were Spanish (95.6%), with smaller numbers identifying as Arab (2%), non-Spanish European (2%), and South American (0.4%). Participants' socio-economic status was determined applying the criterion recommended by the Spanish Society of Epidemiology and Family and Community Medicine (2000) and presented the following distribution: 20.7% low, 20.6% medium-low, 16.5% medium, 20.2% medium-high, and 22.3% high. Participation was voluntary for both children and parents.

Procedures

After contacting several schools in Gipuzkoa and Bizkaia (Spain), and once we had their approval, an information consent sheet was sent to parents. Once in the classroom, children were informed about the study and had the option of declining their participation. At T1 they completed measures of parenting style and internalizing and externalizing problems. At T2 they again completed the measures of internalizing and externalizing problems. Parents were sent additional questionnaire measures of their child's temperament and internalizing and externalizing problems. Upon completion, parents sent the questionnaires to the university. At T1 they answered scales assessing children temperament and internalizing and externalizing problems. At T2 they completed measures of child symptoms only. The responses were anonymous to ensure honesty and participation was in all cases voluntary. In order to match

T1 and T2 responses, a code known only by children was used. Children's and parents' questionnaires were matched by means of a numerical code. There were not differences between children whose parents completed measures and those who did not complete them in punishment, warmth, and internalizing and externalizing problems. The exception was somatization, which was slightly higher among children whose parents participated in the study ($t = 2.29$, $p = 0.022$). Data are available at the Open Science Framework (<https://osf.io/uz7bs>)

Measures

We measured parenting style using a Spanish adaptation of the *Parenting Style Questionnaire* (PSQ, Smith, Towey, Lewis, Bowers, & Binney, not published; cited in Bowers et al. 1994; Zubizarreta & Calvete, not published), child-report version. The PSQ is a 30-item instrument that assesses children's perception of both their mother and father along five dimensions. Children indicate their agree with a series of statements (e.g., "My mother/father can make me feel better when I am upset", "My mother/father shouts at me a lot of the time") on a 3-point Likert scale, from 0 (*not at all*) to 2 (*a lot*). We calculated composite scores comprising responses for both mothers and fathers for the purpose of present statistical analyses. Because in a pilot study we observed that children had difficulties in understanding and answering the inverse items, they were reformulated, so that all the items on the scale were direct (for example, "My mother does not like to hug me" was changed by "My mother does like to hug me"). Two dimensions of the PSQ are used in the present study: warmth (8 items) and punitiveness (7 items). In this study, the Cronbach's alpha coefficients were 0.76 for warmth and 0.82 for punitiveness.

Temperament was assessed using parent-reports on the Spanish adaptation of the Very Short Form of the *Children's Behavior Questionnaire* (CBQ-VSF; Putnam and Rothbart 2006; Spanish adaptation by GIPSE -Grupo de Investigación en Psicología Evolutiva, University of Murcia). The parents were asked to indicate how true a series of 36 statements were of their child on a 7-point Likert scale (1 = *extremely untrue of your child*, 7 = *extremely true of your child*). The questionnaire consists of three general scales (with several subscales each): Surgency/extraversion (used to measure PA), negative affectivity and effortful control. Items include "Likes going down high slides or other adventurous activities", "Gets angry when s/he can't find something s/he wants to play with.", and "Is very difficult to soothe when s/he has become upset". Although it is the shortest version of the original questionnaire, the correspondence in relation to the original scale is 0.83, 0.75, 0.83 for the surgency/extraversion, NA and EC,

respectively (Putnam and Rothbart 2006). In this study, the Cronbach's alpha coefficients were 0.70 for NA, 0.69 for surgency/extraversion, and 0.68 for EC.

We assessed child internalizing and externalizing symptoms using scores on the Spanish adaptation of the *Child Behavior Checklist for ages 6–18* (CBCL; Achenbach and Rescorla 2001). The CBCL is a widely used instrument and answered by parents (and/or primary caregivers) regarding their child in terms of behavioral, emotional and social problems over the past six months. It consists of 120 items with three response options (0 = *Not true*; 1 = *Somewhat or sometimes true*; 2 = *Very true or often true*). In this study, the items corresponding to scales of internalizing (depression and somatic complaints) and externalizing problems (breaking rules and aggressive behavior) were used. In addition, the items that were considered not appropriate or applicable due to the age of the sample, such as those related to sexuality or substance use, were removed. Thus, the final scale used in the present study was composed of 64 items. Cronbach's α at T1 was 0.72 for depression, 0.65 for somatic complaints, 0.66 for rule-breaking, and 0.91 for aggressive behavior. At T2 they were 0.69, 0.71, 0.59 and 0.90, respectively.

In addition, we adapted 31 of these 64 items for administration to children (we omitted those that were not considered adequate due to their content taking into account the age of the children -e.g., suicidal thoughts). Thus, it was possible to obtain parallel measures with different informants. For child-reports, Cronbach's α at T1 was 0.51 for depression, 0.64 for somatic complaints, 0.70 for rule-breaking, and 0.74 for aggressive behavior. At T2 they were 0.52, 0.67, 0.72 and 0.76, respectively. After estimating separately the parent and child-reported scores, we calculated composite scores comprising responses from both child-report and parent-report. Thus, we averaged the child and parent-report scale scores.

Data Analysis

Path analysis with LISREL 9.2 was used to test study hypotheses with the robust maximum likelihood (RML) method, which requires an estimate of the asymptotic covariance matrix of the sample variances and covariances and includes the Satorra-Bentler scaled χ^2 index (S-B χ^2 ; Chou et al. 1991). The initial model included auto-regressive paths from the measures of psychological problems (depression, somatization, rule-breaking, and aggressive behavior) at T1 and the same variables at T2. The model also included paths from punishment, warmth, and the three temperament traits (NA, PA, and EC) to T2 psychological problems. Finally, the model included paths from the two-way interaction terms (i.e., between temperament traits and punishment, between temperament traits and warmth, and

between warmth and punishment) and the three-way interaction terms (i.e., between temperament traits, warmth and punishment) to T2 psychological problems. We transformed the values of temperament traits, punishment and warmth into centered scores by subtracting the mean before estimating the interaction terms (Frazier et al. 2004). The model’s goodness of fit was evaluated using the comparative fit index (CFI), the non-normative fit index (NNFI), the root mean square error of approximation (RMSEA), and the standardized root-mean-square residual (SRMR). Generally, CFI and NNFI values of 0.90 or higher reflect a good fit. RMSEA and SRMR values lower than 0.08 indicate adequate fit of the model for longitudinal data (Little 2013). Missing values at the item-level were imputed by means of the EM algorithm.

We performed a multiple-group analysis to assess whether the predictive model was invariant for boys and girls, following these steps: First, the model was estimated separately in boys and girls. Second, we examined an unconstrained model that included both girls and boys simultaneously. In this model, we freely estimated all of the parameters of the model. Finally, the unconstrained model was compared with a model that constrained the pattern of paths between the variables to make them equal for both girls and boys. Comparisons between models were done following the procedure proposed by Satorra and Bentler (2001) and using an application developed by Crawford and Henry (2003).

Results

Descriptive Statistics

Table 1 shows the means and standard deviations for all measures, differentiated by sex. Differences between girls and boys in all variables were significant, except for depression at T1 and somatization at T1 and T2. Specifically, in terms of psychological problems, girls scored lower in rule breaking and aggressive behavior over time and depression at T2. In addition, warmth was used more frequently with girls, and punishment with boys. Regarding the temperament traits, NA and EC were higher among girls, while PA was higher among boys. Table 2 includes correlation coefficients between all the variables. Most of the correlation coefficients were statistically significant and as expected.

Predictive Model for Punishment, Warmth, and Temperament

Table 3 displays the cross-sectional paths between T1 variables. NA was associated with higher scores on all

Table 1 Means and standard deviations (in brackets) of all variables and sex differences

	Time 1				Time 2							
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys				
	95% CI (LL-UL)	95% CI (LL-UL)	95% CI (LL-UL)	95% CI (LL-UL)	95% CI (LL-UL)	95% CI (LL-UL)	95% CI (LL-UL)	95% CI (LL-UL)				
Depression	0.33 (0.31)	0.29–0.37	0.38 (0.32)	0.34–0.41	–1.81	–0.16	0.28 (0.34)	0.24–0.32	0.38 (0.39)	0.34–0.42	–3.12*	–0.37
Somatization	0.54 (0.29)	0.51–0.58	0.51 (0.32)	0.47–0.54	1.38	0.10	0.61 (0.41)	0.56–0.66	0.58 (0.41)	0.53–0.63	0.78	0.07
Rule-breaking	0.17 (0.17)	0.15–0.20	0.28 (0.23)	0.25–0.30	–5.82**	–0.54	0.17 (0.21)	0.15–0.20	0.35 (0.35)	0.31–0.38	–7.14**	–0.61
Aggressive behavior	0.36 (0.23)	0.33–0.39	0.46 (0.28)	0.43–0.49	–4.64**	–0.39	0.34 (0.26)	0.31–0.37	0.48 (0.34)	0.44–0.52	–5.58**	–0.46
Punishment	0.46 (0.34)	0.42–0.50	0.58 (0.36)	0.54–0.62	–3.94**	–0.34						
Warmth	1.79 (0.21)	1.76–1.81	1.72 (0.26)	1.70–1.75	3.31**	0.29						
Negative affectivity	4.13 (0.86)	4.02–4.23	3.92 (0.86)	3.82–4.02	2.90*	0.24						
Positive affectivity	4.19 (0.65)	4.11–4.27	4.39 (0.76)	4.30–4.48	–3.38**	–0.28						
Effortful control	5.09 (0.68)	5.00–5.17	4.64 (0.72)	4.56–4.72	7.59**	0.64						

* $p < 0.05$; ** $p < 0.001$

Table 2 Correlation coefficients between all the variables at T1 and T2

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Punishment	1												
2. Parental warmth	−0.21**	1											
3. NA	0.06	0.04	1										
4. PA	0.12**	0.04	0.04	1									
5. EC	−0.06	0.08	0.19**	0.17**	1								
6. T1 depression	0.34**	−0.17**	0.17**	−0.10*	−0.13**	1							
7. T1 somatization	0.24**	−0.04	0.20**	−0.04	0.02	0.33**	1						
8. T1 rule-breaking	0.40**	−0.24**	0.11**	0.16**	−0.15**	0.38**	0.27**	1					
9. T1 aggressive behavior	0.45**	−0.17**	0.29**	0.25**	−0.12**	0.45**	0.36**	0.67**	1				
10. T2 depression	0.23**	−0.20**	0.11**	0.04	−0.02	0.36**	0.24**	0.34**	0.38**	1			
11. T2 somatization	0.18**	−0.12**	0.10*	0.02	−0.02	0.22**	0.37**	0.21**	0.25**	0.42**	1		
12. T2 rule-breaking	0.28**	−0.15**	0.04	0.12**	−0.09*	0.21**	0.05	0.45**	0.40**	0.33**	0.27**	1	
13. T2 aggressive behavior	0.31**	−0.13**	0.14**	0.20**	−0.04	0.26**	0.20**	0.44**	0.55**	0.47**	0.40**	0.69*	1

* $p < 0.05$; ** $p < 0.001$

Table 3 Cross-sectional associations between variables at T1 in the estimated model

	1	2	3	4	5	6	7	8	9
1. T1 Depression	1								
2. T1 Somatization	0.33**	1							
3. T1 Rule-breaking	0.38**	0.27**	1						
4. T1 Aggressive behavior	0.45**	0.36**	0.67**	1					
5. Negative affectivity	0.17**	0.20**	0.11*	0.29**	1				
6. Positive affectivity	−0.10*	−0.04	0.16**	0.25**	0.04	1			
7. Effortful control	−0.13**	0.02	−0.15**	−0.12*	0.19**	0.17**	1		
8. Punishment	0.34**	0.24**	0.40**	0.45**	0.06	0.12*	−0.06**	1	
9. Warmth	−0.17**	−0.04	−0.24**	−0.17**	0.04	0.04	0.08	−0.21**	1

* $p < 0.05$; ** $p < 0.001$

psychological symptoms. PA was associated with less depression and more rule-breaking and aggressive behavior. EC was associated with lower scores on all psychological problems but somatization. Punishment was positively associated with all psychological problems whereas warmth was negatively associated with all psychological problems but somatization. Punishment and warmth were negatively associated with each other. Warmth was not associated with any temperament trait. Punishment was positively associated with PA and negatively with EC.

Regarding longitudinal paths, all autoregressive paths for psychological problems were statistically significant and moderate. Punishment predicted an increase in all psychological problems over time, whereas warmth predicted reductions in depression and somatization. Temperament traits did not predict changes in psychological problems over time, except PA, which predicted an increase of

aggressive behavior at the follow-up. Regarding two-way interactions, NA moderated the predictive association between punishment and both rule-breaking behavior and aggressive behavior. Finally, the path from the punishment x warmth x EC interaction term to T2 depression was statistically significant. This model obtained excellent fit indexes, $S-B\chi^2(154, N = 572) = 294$, $RMSEA = 0.033$, $90\%CI [0.025; 0.040]$ $p = 1$, $CFI = 0.974$, $NNFI = 0.958$, $RMSR = 0.071$. The model explained 17, 15, 18, and 25%, respectively, of the variance in depression, somatization, rule-breaking, and aggressive behavior at T2. Figure 1 displays the significant standardized paths of the model.

Next, we plotted the NA x punishment interaction for rule-breaking. Figure 2 displays the predictive association between punishment and rule-breaking for children that score low (1 SD below the mean) and high (1 SD above the mean) for NA. As observed, this association is more intense

Fig. 1 Predictive model of symptoms. Only significant paths are depicted. *Note.* Standardized coefficients are shown. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

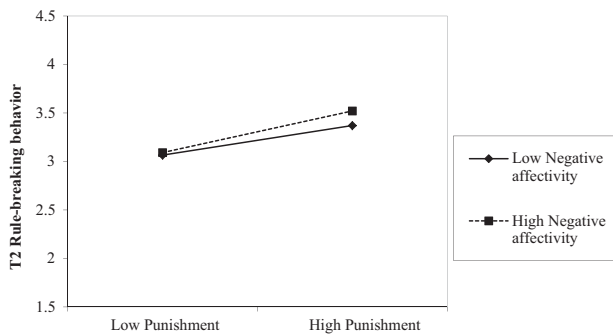
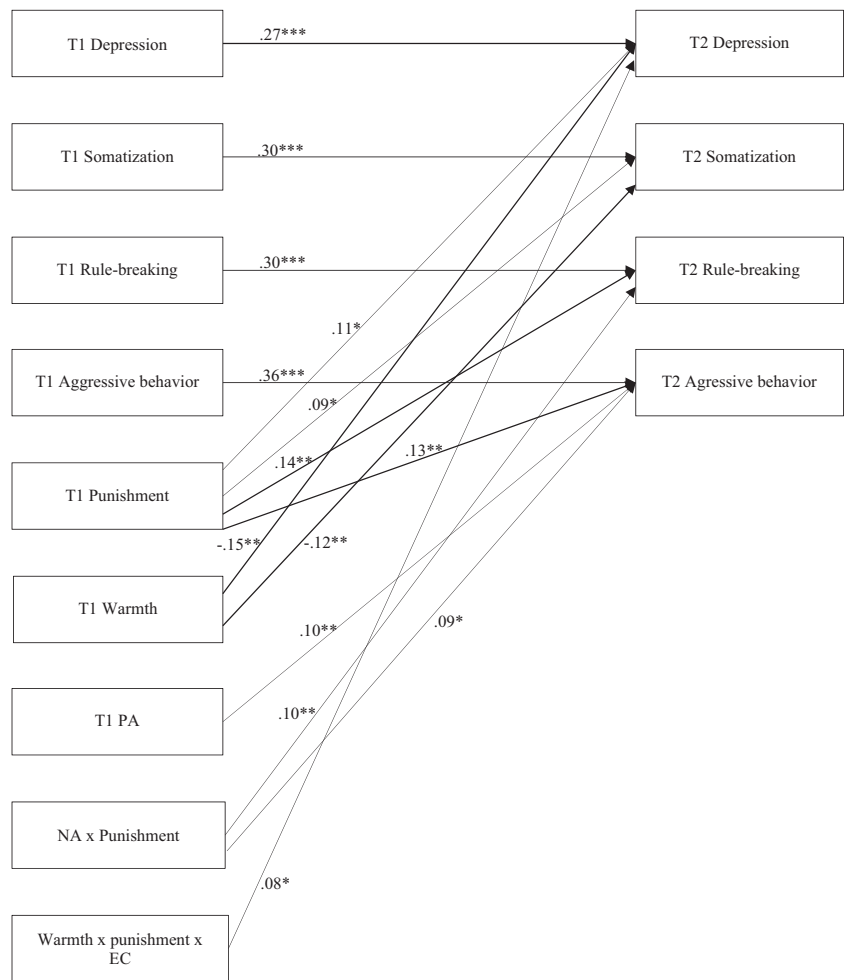


Fig. 2 Interaction between negative affectivity and punishment for rule-breaking

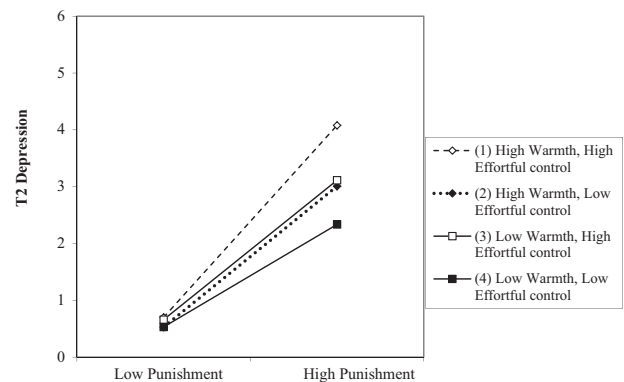


Fig. 3 Interaction between punishment, warmth, and effortful control for depression

among children that score high on NA. The plot for this interaction for aggressive behavior is not displayed because it had a similar form. Finally, Fig. 3 displays the plot for the three-way punishment x warmth x EC interaction term. As can be seen, the predictive association between punishment and depression was more intense when both warmth and EC were high and less intense when both warmth and EC were low.

Sex Differences in the Model

The longitudinal model was estimated separately in boys and girls. The model obtained adequate fit indexes in boys, $S-B\chi^2(154, N = 308) = 223$, $RMSEA = 0.040$, $90\%CI [0.023; 0.051]$ $p = 0.93$, $CFI = 0.965$, $NNFI = 0.942$, $RMSR = 0.09$, and in girls, $S-B\chi^2(154, N = 268) = 114$,

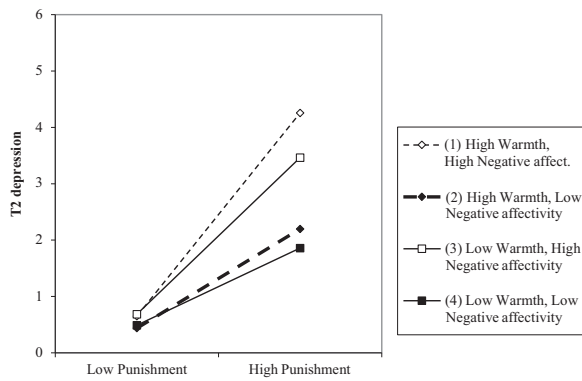


Fig. 4 Interaction between punishment, warmth and negative affectivity for depression in the sample of boys

RMSEA = 0.001, 90%CI [0.00; 0.001] $p = 1$, CFI = 1, NNFI = 1, RMSR = 0.071. In boys, an additional three-way interaction was statistically significant for depression: the punishment \times warmth \times NA. Figure 4 displays the form of this interaction. Punishment predicted higher depression at the follow-up when both warmth and NA were high.

We examined an unconstrained model that included both girls and boys simultaneously. This model provided an adequate fit to the data: S-B $\chi^2(308, n = 576) = 344$, RMSEA = 0.020, 90% CI [0.00; 0.031], NNFI = 0.984, CFI = 0.990, SRMR = 0.07. Finally, the unconstrained model was compared with a model that constrained the pattern of paths between the variables to make them equal for both subsamples (i.e., girls and boys). According to the corrected chi-squared difference test (Crawford and Henry 2003), the fit of the more-restrictive longitudinal model was not significantly worse than the fit of the less-restrictive longitudinal model (specifying freely estimated parameters), Δ S-B $\chi^2(64, N = 576) = 37, p = 0.99$. Therefore, this result confirmed the invariance of the model across sexes.

Discussion

This study aimed to explore the impact of punitive discipline on child internalizing and externalizing problems, as well as the moderating role of temperament traits and positive aspects of parenting (i.e., warmth) in this relationship, thus providing a more complete understanding of the relationship between parental punishment and child psychological difficulties.

As expected, parental punishment predicted increases in child internalizing and externalizing symptoms over time. This is consistent with existing longitudinal research indicating positive associations between punitive parenting and child psychological distress and behavior problems (Flouri and Midouhas 2017; Muhtadie et al. 2013; Pinquart 2017). We also hypothesized that temperament would moderate the

predictive role of punishment in psychological problems. Contrary to expectations, we only found evidence for moderation by NA, such that children high in NA experienced higher levels of externalizing symptoms in response to parental punishment. This finding is consistent with previous research (Kiff et al. 2011; Morris et al. 2002; Van Aken et al. 2007). Moreover, overall, the role of temperament as predictor of psychological problems was very small. We observed that none of the temperament traits predicted changes in problems, except for PA, which predicted an increase of aggressive behavior over time. PA has been related with approach behaviors, less fear, and higher proneness to frustration and impulsivity (Berdan et al. 2008; Rothbart et al. 2000; Stifter et al. 2008). These characteristics have been associated to aggressive behavior. Although the rest of longitudinal associations between temperament traits and psychological problems were not significant, we found several significant cross-sectional associations between variables. Thus, NA was concurrently associated with higher scores on all psychological problems, and PA was concurrently associated with less depression and more rule-breaking and aggressive behavior. EC was associated with lower scores on all psychological problems but somatization.

Findings from previous studies on the interplay between warmth and punitive parenting indicate that this is an unsolved question. In our study, although parental warmth was associated with decreases in internalizing problems (i.e., depression and somatization), consistent with previous research (Hipwell et al. 2008; Williams et al. 2009), warmth did not moderate the simple relationship between punishment and psychological problems. Thus, this result would be in part consistent with findings from some of the previous studies in which warmth did not moderate the associations between punishment and child externalizing and internalizing problems (e.g., Kiff et al. 2011; Lansford et al. 2014; Wang and Kenny 2013, 2014). However, our results display a more complex picture as they suggest that a combination of high parental warmth and high EC in the child could augment the negative effect of punishment in depressive symptoms. Namely, the results indicate a significant three-way interaction between punishment, warmth and EC, according to which punishment has a greater effect in depression when it takes place in families where warmth is high and the child is characterized by high EC, and has a lesser effect when both warmth and EC are low. An interpretation of this finding is that high warmth may be felt as contradictory by the child in a family context where punishment is overused, and children with high EC may be constantly trying to deal with this contradiction by dysfunctional self-regulatory efforts (e.g., Kopp and Neufeld 2003; Koutstaal 2011). Effortful control is the ability to suppress a dominant or impulsive response (Rothbart and

Bates 2006), for example anger or an aggressive behavior in response to punishment. Thus, one tentative explanation could be that child may encounter contradictory impulsive reactions, ones in response to punishment (i.e. negative reactions) and the others in response to warmth (i.e. positive reactions). This may yield to confusion and bewilderment and, so, to internalized problems due to the constant trying to face that confusion. Anyway, this result is intriguing and warrants further investigation so the mechanisms involved in this pattern of result may be better understood.

We also examined sex differences in this study. Girls reported lower rates of depression than boys at T2, which contrasts with higher depression rates among girls in other studies (e.g., Albert 2015; Keiley et al. 2003). This can be explained because of children's age, as they were included between ages 6 to 10. Previous literature has indicated that sex differences in depression do not begin to emerge until mid-adolescence (e.g., Bongers et al. 2003; Hankin and Abramson 2001). Regarding sex differences in the role of parenting and temperament in child psychological problems, overall all the associations between variables were similar. However, in boys a significant three-way interaction between punishment, warmth and NA emerged for depression. Concretely, punishment had a greater effect in depression when both parental warmth and NA were high whereas this effect was lesser when both warmth and NA were low. Thus, this finding suggests that boys who present characteristics of NA such as feelings of sadness and shame (Putnam et al. 2008) can be more vulnerable to apparent contradictory parent behavior that combines punishment with warmth. However, it is difficult to explain why this pattern emerged only in boys.

Overall, the results obtained show that punishment plays a central role in the development of behavior problems in children and that this role is relatively independent of other influences. Thus, punishment is uniquely associated with problems over time and tends to be detrimental regardless of co-existing positive parenting practices (MacKenzie et al. 2012; McKee et al. 2007; Stormshak et al. 2000). Parental warmth not only does not buffer the negative effect of punishment but also can increase it when warmth combines with other characteristics of children, such as EC or –in the case of boys – NA.

Strengths, Limitations and Future Research

The present study demonstrates a number of strengths. The sample was obtained from several schools and included families from a broad socioeconomic status range. In addition, by recruiting children ages 6–10, an understudied population, this study advances knowledge on childhood processes that may be critical to future psychological adjustment. Childhood psychological difficulties are one of

the most potent predictors of psychological problems in adult life (Rutter et al. 2006). Despite the critical role of childhood internalizing and externalizing symptoms in the prediction of subsequent psychopathology, research has predominantly focused on symptoms experienced among samples of adolescents and adults. Thus, the present study lends needed insight into childhood processes that may contribute to long-term psychological outcomes. Moreover, we integrated data from parent and child informants collected across two time points, which enabled prospective prediction.

Despite these strengths, results of the present study should be interpreted in light of several limitations. First, childhood symptoms are not as clearly demarcated along dimensions of internalizing and externalizing as are symptoms manifested in adolescence or adulthood, and some childhood symptoms are easier to assess (e.g., externalizing problems) than others. In fact, the reliability of depression based on child-reports was low. Second, only 54% of the parents completed measures. Although, there were no significant differences in the final sample for those children whose parents did not complete measures compared to those who did (except in somatization), we cannot rule out possible difference in temperament variables, which would limit the representativeness of the sample. Third, although we used both child and parent reports to reduce shared informant variance, the use of other sources of information such as teachers or peers to assess behavioral problems would have improved the validity of the results. Also, the effect sizes of the associations were relatively small. Finally, in this study we did not include interdependent and bi-directional associations between temperament and parenting although these can be transactional. Namely, child temperament and behavior may elicit a parent response that reinforce the child basic tendency and this, in turn, may result in a stronger parent response (e.g., Bates et al. 2012; Bates and Pettit 2007; Kiff et al. 2011; Rothbart and Bates 2006).

Understanding how internalizing and externalizing problems evolve, particularly in response to widely endorsed parenting practices, is essential to inform intervention strategies aimed at ameliorating childhood psychological problems and promoting healthy development across the lifespan. These results add up to those showing the negative consequences of the punitive parenting style. These consequences, moreover, appear independently of the existence of other contextual variables (i.e., warmth) and temperamental variables. Thus, they visualize the need to promote alternative parenting styles that reinforce psychological well-being and adjustment. Also, the results do highlight the need for more research about the topic. Nevertheless, it is important for future research to replicate the findings of this study solving the aforementioned limitations to further

investigate the implicated mechanisms and their reciprocal associations.

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Author Contribution A.Z.: designed and executed the study, collected data, assisted with the data analyses and wrote part of the paper. E.C.: designed the study, analyzed the data, wrote the results and part of the paper and edited drafts by A.Z. and the final manuscript. B.H.: collaborated in the writing and editing of the final manuscript.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee of the University of Deusto (Spain) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This paper does not include any studies with animals.

Informed Consent Informed consent was obtained from all individual participants included in the study and their parents.

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