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Longitudinal associations between mothers' and fathers' anger/irritability expressiveness, harsh parenting, and adolescents' socioemotional functioning in nine countries

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Abstract

The present study examined parents' self-efficacy about anger regulation and irritability as predictors of harsh parenting and adolescent children's irritability (i.e., mediators), which in turn were examined as predictors of adolescents' externalizing and internalizing problems. Mothers, fathers, and adolescents ($N = 1,298$ families) from 12 cultural groups in nine countries (China, Colombia, Italy, Jordan, Kenya, Philippines, Sweden, Thailand, and United States) were interviewed when children were about 13 years old, and again one and two years later. Models were examined separately for mothers and fathers. Overall, cross-cultural similarities emerged in the associations of both mothers' and fathers' irritability, as well as mothers' self-efficacy about anger regulation, with subsequent maternal harsh parenting and adolescent irritability, and in the associations of the latter variables with adolescents' internalizing and externalizing problems. The findings suggest that processes linking mothers' and fathers' emotion socialization and emotionality in diverse cultures to adolescent problem behaviors are somewhat similar.

Keywords

irritability; anger; harsh parenting; behavior problems; adolescence

Toward clarifying the determinants of adolescents' socioemotional functioning: Tips from the parental socialization heuristic model (Eisenberg et al., 1998)

How do parents' beliefs and behaviors affect children's experience, expression, and regulation of emotions (i.e., emotion development)? How does children's emotion development predict adolescents' socioemotional development and risk of psychopathology? Those are some of the questions that many previous studies have addressed in the last 20 years, inspired by the heuristic model presented by Eisenberg, Cumberland, and Spinrad (1998) on parental emotion socialization. The primary target of this research has been parents' reactions to children's experience and expression of emotion (i.e., one of the parental socialization or emotion-related socialization behaviors; ERSBs).

Eisenberg and her colleagues underlined the high degree of complexity of understanding ERSBs, prompting the study of determinants, as well as moderators and mediators, of associations between ERSBs and child outcomes. Correlates of ERSBs include parental characteristics, parent-child relationship characteristics, and child characteristics. In terms of parental characteristics, Eisenberg et al. (1998) stated that "parental display of emotion, even when they are not reactions to the child's emotion, can affect the child's arousal by contagion, vicarious processes, or through the meaning that the child attributes to the parental emotional display" (p. 243). Associations between parental emotion expressions and children's emotions may change depending on the specific emotion being expressed and may vary depending on whether the parental emotion reaction is directed specifically toward the child or not (Eisenberg et al., 1998). In addition, norms about how children should modulate their emotion expression vary depending on the cultural context in which children live (e.g., Matsumoto, Yoo, & Chung, 2010). Thus, another prompt coming from Eisenberg et al.'s (1998) heuristic model is to evaluate how ERSBs undermine or support children's socioemotional development, taking into account the cultural context in which the family system is embedded.

The present study examined associations between parents' emotionality or self-efficacy about their emotionality as a parental characteristic (i.e., self-efficacy beliefs about anger regulation and irritability, both of which were not directed specifically toward children's emotional reaction) with physical and verbal forms of discipline (harsh parenting; e.g., Lansford et al., 2014) as an aspect of parenting that is likely to include parental displays of negative emotionality and negative (e.g., punitive) reactions to children's expressions of emotion (and also may reflect the quality of the parent-child relationship). These parent-related variables were used to predict children's temperamental reactivity (i.e., irritability) as a child characteristic. These aforementioned variables were examined in light of their predictive power for adolescents' risk of psychopathology (i.e., externalizing and internalizing problems). In addition, these associations were examined in nine countries, adding evidence about cultural similarities and differences in ERSBs in the Eisenberg et al. (1998) model.

The present study addressed some of the issues identified by Eisenberg and colleagues, such as the importance of focusing on parents' irritability considering that relations involving negatively valenced emotional expressions "are more complex than those for positive family expressiveness" (p. 261). Moreover, whereas most of the literature reviewed by Eisenberg et al. (1998) focused on infant, preschool, and school-age children, the present study focused on the transition to adolescence. It is important to study parental socialization and its correlates during adolescence because this phase of life is associated with substantial increases in the prevalence of a wide range of externalizing behavior problems (EXTs) and internalizing problems (INTs) that have long-term implications for both physical and mental health in adulthood around the world (e.g., Lancet Editorial, 2017). EXTs include overt and covert problematic behaviors, such as aggression and delinquency, respectively, directed toward the external environment (Achenbach, 1991). INTs include anxious and depressive symptoms, social withdrawal, and somatic complaints (Achenbach, 1991). When examining the diverse predictors of adolescent mental health, researchers have previously identified separate contributions of parents' and adolescents' characteristics and behaviors (e.g., Belsky, 1984; Eisenberg et al., 1998; Morris et al., 2007). In the present study, we sought to investigate the joint prediction of adolescents' EXTs and INTs from parents' self-efficacy beliefs about anger regulation and irritability, harsh parenting, and adolescents' irritability. Such associations were examined longitudinally (from age 13 to age 15) and cross-culturally.

Adolescent Anger/Irritability and Socioemotional Functioning in Adolescence

Adolescent negative emotionality is a key factor implicated in the development of psychopathology that has received considerable attention in both prevention and intervention research (e.g., Izard, 2002). It probably is also one of the child's characteristics associated with parental socialization of emotion, via its role as both a determinant of ERSBs and as a moderator of the association between ERSBs and child socioemotional functioning. Throughout childhood and adolescence, negative emotionality has been related to both EXTs (e.g., Mullin & Hinshaw, 2007) and INTs (e.g., Yap et al., 2007). However, the association between negative emotionality and adjustment might depend on the type of negative emotion being managed (e.g., Rothbart & Bates, 2006). Anger/irritability (hereafter referred to as irritability) has received considerable empirical attention in research with children and adolescents. As an aspect of temperamental reactivity, children's irritability is related to the latency, duration, and intensity of motor, affective, and attentional angry reactions (Rothbart & Bates, 2006). During childhood and adolescence, frequent irritability has been associated with both EXTs and INTs (e.g., Sheeber, Allen, Davis, & Sorensen, 2000). Moreover, in longitudinal studies, irritability in childhood and adolescence has predicted maladjustment in adulthood (e.g., Copeland, Shanahan, Egger, Angold, & Costello, 2014). Given the cross-diagnostic and long-term impact of irritability during adolescence, it is crucial to understand mechanisms associated with its development.

Parental Irritability, Harsh Parenting, Adolescents' Irritability, and Socioemotional Functioning

There is a wealth of evidence indicating that irritable people (i.e., those who tend to be angry and reactive to the slightest provocation; Caprara et al., 1985), in general, more easily engage in aggression than less irritable people (e.g., Bettencourt et al., 2006). Thus, parental irritability may increase the likelihood of harsh parenting. In addition, parents' irritability (particularly mothers), as well as high levels of harsh parenting, have been related to their children's EXTs and INTs (e.g., Gershoff, 2002; Lansford et al., 2018).

Parents' Irritability and Adolescents' Irritability

Parents are a key influence on children's and adolescents' abilities to regulate their emotions (Sheeber et al., 2000). One goal of this study was to examine the association between parents' irritability and their adolescent children's irritability. This goal was inspired not only by Eisenberg et al.'s (1998) theory of parental socialization, but also on the Tripartite Model of the impact of the family on children's emotion regulation and adjustment by Morris, Silk, Steinberg, Myers, and Robinson (2007). Theoretical perspectives on observational learning/modelling suggest that parents' personal emotional tendencies implicitly teach adolescents which emotions and self-management strategies are appropriate. By observing their parents' reactions to provocative emotional situations, children learn what is expected of them in analogous situations in their own lives. Heredity of emotional characteristics involved in reactivity processes (e.g., negative emotionality) can also partly explain similarities in parents' and children's irritability (e.g., Borkenau, Rieman, Angleitner, & Spinath, 2001). In addition, parents who are prone to experience negative emotions may have difficulties regulating those emotions that, in turn, might be transmitted to their children via observational learning (e.g., Eisenberg, Fabes, Guthrie, & Reiser, 2000; Morris et al., 2007; Rothbart & Bates, 2006), as well as heredity (Bavilacqua & Goldman, 2012).

Toward an Integrative View

According to the model of parental socialization of emotion (Eisenberg et al., 1998), parents' expressions of emotion (e.g., irritability) affect adolescents' socioemotional functioning through, among other ERSBs, parents' behaviors (e.g., harsh parenting; physical and verbal punishment and coercive parent-child interactions) and adolescents' characteristics (e.g., adolescents' irritability). An integrative view among such constructs is also consistent with Belsky's (1984) and Bornstein's (2016) model in which parents' characteristics are viewed as influencing the quality of their parenting, and quality of parenting affects their children's emotional competence and adjustment. Inspired by those models, several groups of researchers have found support for a positive association between parents' (especially maternal) irritability and parents' difficulties in managing their own negative emotions and harsh parenting (e.g., Saritas, Grusec, & Gençöz, 2013). Other studies suggested that parents' irritability is related to aggressive behaviors toward their children (i.e., harsh parenting; Shay & Knutson, 2008), which, in turn, could influence the development of their children's EXTs and INTs (for a review, see Gershoff, 2002). Taken

together, these results support the view that parent irritability leads to greater parental harsh parenting and adolescent irritability (although the latter could also affect the quality of parenting), both of which increase the likelihood of EXTs and INTs.

Within such an integrative view, further comment is needed about harsh parenting, which includes more than an ERSB, and may not be equated to a typical ERSB as conceptualized by Eisenberg et al. (1998). Harsh parenting includes physical and verbal (e.g., scolding, yelling) punishment and coercive parent-child interactions (e.g., Lipscomb et al., 2011). When harsh parenting occurs, parents typically have difficulty with emotional control and tend to escalate their violence behavior (e.g., Scaramella, Sohr-Preston, Mirabile, Robinson, & Callahan, 2008).

Novel Parent Characteristics, Harsh Parenting, and Adolescents' Irritability

One of the novel aspects of this study was its focus on parents' self-efficacy beliefs about anger regulation as a parent characteristic (in addition to parental irritability) that might affect both parents' behaviors (i.e., harsh parenting) and adolescents' irritability. Specifically, the present study focused on self-efficacy beliefs about emotion regulation (e.g., Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003)--what parents believe themselves capable of doing in response to their emotional experiences, including exerting control over the origins and intensity of, reactions to, and consequences of, one's own emotions (Bandura et al., 2003). Thus, one's self-efficacy beliefs about emotion regulation likely impact many aspects of one's response to emotionally evocative situations, including the interpretation of situations, the expression of emotion, choice of regulatory strategies, and evaluation of consequences (e.g., Caprara, Di Giunta, Pastorelli, & Eisenberg, 2013). Previous studies involving adults supported moderate associations of high self-efficacy about anger regulation with low irritability and aggression (e.g., Caprara et al., 2013).

In line with the aforementioned theoretical models delineating conceptual associations among parents' emotionality, adolescents' emotionality, and developmental outcomes (i.e., Belsky, 1984; Eisenberg et al., 1998; Morris et al., 2007), there is preliminary evidence suggesting that parental self-efficacy beliefs about anger regulation are related with correspondent adolescents' beliefs, which in turn impact adolescents' EXTs and INTs (e.g., Di Giunta et al., 2018). Yet, to our knowledge, no empirical work has tested this hypothesis.

Parenting and Adolescents' Adjustment Across Countries

When considering the role of family life in adolescent adjustment, it is important to acknowledge that families are embedded within cultural contexts that affect their cognitions and behaviors (e.g., Bornstein, 2009). Cross-cultural and intracultural theories underline the importance of belief systems to understand cultural variations (Harkness & Super, 2002). The same parenting characteristics, as well as child behaviors, can be interpreted differently cross-culturally and can produce certain outcomes in some cultures and not in others (Bornstein, 2009). The present study addresses two gaps in the literature by examining associations among parents' irritability, harsh parenting, adolescents' irritability, and adolescents' adjustment in two novel ways: namely, examining both mothers' and fathers'

irritability and their emotion socialization practices (i.e., maternal and paternal harsh parenting) and examining these associations across nine different countries (including 12 cultural contexts).

Parents' and Adolescents' Emotional Functioning Around the World

Evidence indicates that there are cultural differences in the expression of discrete emotions. In the case of the basic emotion of anger/irritability, its expression is considered to be similar worldwide (Ekman, 1999). However, how typical it is to express anger differs (Matsumoto, Yoo, & Chung, 2010). For example, some researchers have found that anger expression is more typical in individualistic than collectivistic cultures (Earley & Gibson, 1998), whereas anger suppression is more typical in collectivistic groups (Porter & Samovan, 1998).

Other researchers have identified both variation and similarities among cultures in the emotional significance given to situations, the manner in which emotions are conveyed, and the manner in which people deal with situations that elicit emotion (e.g., Mesquita, 2001). For example, multiple studies have shown that there are cross-cultural differences in emotion regulation between American and Asian countries (Matsumoto, Yoo, & Fontaine, 2008). Similarly, other researchers have found that adults in collectivist cultures tend to have higher scores on emotion suppression when compared to adults in individualistic cultures (Matsumoto et al., 2008). More cross-cultural studies are needed to better understand the role of culture in shaping association between negative emotions and adolescents' adjustment.

The Present Study

This longitudinal study examined whether harsh parenting and adolescents' irritability mediated the relation between parental self-efficacy beliefs about anger regulation and irritability and adolescents' EXTs and INTs. We had three main hypotheses: (a) parents who have lower self-efficacy about anger regulation and are higher in irritability engage in harsher parenting and have offspring with higher irritability; (b) harsh parenting and higher adolescent irritability predict more EXTs and INTs; and (c) harsh parenting and adolescent irritability mediate relations between parents' self-efficacy beliefs about anger regulation and irritability and adolescents' EXTs and INTs.

We sought to increase external validity of our findings, and to identify limits to the generalizability of the results of this study. In addition, more information on the prediction of adolescents' socioemotional development from mothers' and fathers' emotionality and parental socialization of emotions is warranted (e.g., Brand & Klimes-Dugan, 2010). Contemporary cross-cultural research suggests that, overall, mothers are more involved than fathers in parenting their children, but the gap diminishes as children grow older (OECD, 2017). Despite the lower levels of paternal involvement in childcare, previous studies without a cross-cultural approach found a significant association between fathers' emotion socialization and child emotional competence and psychological distress (e.g., McDowell & Parke, 2005). However, when both maternal and paternal emotion socialization are examined, (a) mothers and fathers often express similar types of emotions (e.g., Halberstadt

et al., 1995); (b) mothers are typically more emotionally expressive than fathers within the family context, which makes mothers more available to their children for modeling emotional expressiveness (Halberstadt et al., 1995); (c) greater emotional arousal is linked to father-child interaction than mother-child interaction (Parke, 1996). In addition, different cultures may rely on different expectations about what is considered appropriate in men's and women's (fathers' and mothers') emotion expression (e.g., anger expression; Matsumoto et al., 2010). Thus, it is crucial to examine how both maternal and paternal emotion socialization predict adolescent development.

Given the dearth of relevant cross-cultural research including parenting and both parents' and adolescents' anger-related characteristics, we cannot formulate clear hypotheses regarding the association between parental self-efficacy beliefs about anger regulation and irritability, harsh parenting, adolescents' irritability, and EXTs and INTs cross-culturally.

Method

Participants

The families investigated in the current study are participants in a larger ongoing longitudinal investigation of parenting and child mental health across cultures. The present analyses used data collected in three consecutive years, when child participants were approximately ages 13-15. Participants (Table 1) included 1,298 children ($M = 13.13$ years, $SD = .91$, 51% girls), their mothers ($N = 1,275$, $M = 41.74$ years, $SD = 6.62$), and their fathers ($N = 1,032$, $M = 44.70$ years, $SD = 6.51$). Families were recruited from 12 distinct ethnic/cultural groups across 9 countries including: Shanghai, China ($n = 121$); Medellín, Colombia ($n = 108$); Naples ($n = 100$) and Rome ($n = 103$), Italy; Zarqa, Jordan ($n = 114$); Kisumu, Kenya ($n = 100$); Manila, Philippines ($n = 120$); Trollhättan/Vänersborg, Sweden ($n = 101$); Chiang Mai, Thailand ($n = 120$); and Durham, NC, United States ($n = 111$ European American, $n = 103$ African American, $n = 97$ Latin American). Participants were recruited through letters sent from schools. Most parents lived together (82%) and were biological parents (97%); nonresidential and non-biological parents were able to provide data. Sampling included families from the majority ethnic group in each country, except in Kenya where we sampled Luo (3rd largest ethnic group, 13% of population), and in the United States, where we sampled equal proportions of European American, African American, and Latin American families. Socioeconomic status was sampled in proportions representative of each recruitment area. Child age and gender did not vary across countries. Attrition was minimal: 79% of the original sample provided data at age 15. Participants who provided follow-up data did not differ from the original sample with respect to any demographic variable or any study variables $F(1,928) = 3.98$, $p = .05$, except for harsh parenting (i.e., the families who were part of the study longitudinally showed higher scores for harsh parenting than those ones who did not provide data at age 15 ($F(1,707) = 6.12$, $p = .01$)).

Procedure

Measures were administered in Mandarin Chinese (China), Spanish (Colombia and the United States), Italian (Italy), Arabic (Jordan), Dholuo (Kenya), Filipino (the Philippines), Swedish (Sweden), Thai (Thailand), and English (the United States and the Philippines)

following forward- and back-translation and meetings to resolve any item-by-item ambiguities in linguistic or semantic content (Erkut, 2010). Country coordinators and the translators reviewed the discrepant items and made appropriate modifications.

Interviews lasted 2 hours and were conducted after parent consent and child assent were given in locations chosen by the participants (e.g., home, school). Participants were given the choice of completing the measures in writing or orally. Families were paid modest monetary compensation for participation. Procedures for the project were approved by the Duke University Institutional Review Board (IRB; Study title: Parenting, adolescent self-regulation, and risk-taking across cultures; Protocol number: 2032), as well as by university IRBs in all of the other participating countries—University of Macau, Macau, China; Universidad San Buenaventura, Medellín, Colombia; Hashemite University, Zarqa, Jordan; University of Naples, Naples, Italy; Università di Roma, Rome, Italy; Maseno University, Maseno, Kenya; Ateneo de Manila University, Quezon City, Philippines; University West, Trollhättan, Sweden; Chiang Mai University, Chiang Mai, Thailand.

Measures

Item were averaged to create the scale scores for all the measures reported below.

Mothers' and fathers' self-efficacy about anger regulation.—When children were 13 years old, mothers and fathers (α s across cultures = .64 to .81 and .62 to .85, respectively) rated (1 = *not well at all*; 5 = *very well*) their ability to manage anger with four items (e.g., “How well can you avoid flying off the handle when you get angry?”) of the Regulative Emotional Self-Efficacy Scale (RESE; Caprara et al., 2013). Higher scores indicate greater self-efficacy.

Mothers' and fathers' irritability.—When children were 13 years old, mothers and fathers self-reported how easily they were angered or irritated using the 4-item Irritability Scale, which has been used and validated in numerous cultures (Caprara et al., 1985). Parents rated items (e.g., “When I am tired, I easily lose control”) on a 0 = *completely false for me* to 5 = *completely true for me* scale (α s across cultures = .72 to .89 for mothers and .72 to .92 for fathers with the exception of Kenya (α = .59)). Higher scores indicate greater parent irritability.

Mothers' and fathers' harsh parenting.—When children were ages 13 and 14, mothers and fathers reported on their use of harsh parenting practices to deal with children's misbehaviors using the Discipline Interview. This measure has demonstrated excellent reliability and validity in numerous cultures, including all cultures in the current study (Huang et al., 2012). Parents reported the frequency (1 = *never* to 5 = *almost every day*) that they used seven different harsh disciplinary behaviors (e.g., spanking, yelling at). Higher scores indicate harsher parenting (α s = .72 to .86 for mothers and α s = .73 to .89 for fathers).

Adolescents' irritability.—When children were 14 years old, mothers and fathers reported (1 = *almost always untrue of you* to 5 = *almost always true of you*) how easily their children were angered or irritated using a subset of items from the Irritability subscale of the

Early Adolescent Temperament Questionnaire-Revised (EATQ-R; Ellis & Rothbart, 2001; e.g., “(S)he gets irritated when (s)he has to stop doing something that (s)he is enjoying”; α s = .69 to .91 across all reporters and cultures). The items in the present study were the four out of 11 items from the original subscale that had the highest factor loadings in confirmatory factor analyses with preadolescents from Colombia, Italy, and the United States (Thartori et al., 2018).

Adolescent externalizing (EXTs) and internalizing (INTs) problems.—Mothers and fathers completed the Child Behavior Checklist, and adolescents completed the Youth Self Report (Achenbach, 1991) when adolescents were 13 and 15 years old. Participants rated how true each item was of the adolescent during the last six months (0 = *not true*, 1 = *somewhat or sometimes true*, 2 = *very or often true*). The *Externalizing Behavior* scale averaged across 33 items (for parent reports) or 30 items (for adolescent reports) and captured behaviors such as lying, truancy, vandalism, bullying, drug and alcohol use, disobedience, tantrums, sudden mood change, and physical violence. The *Internalizing Behavior* scale averaged across 31 items (for parent reports) or 29 items (for adolescent reports) and measured behaviors and emotions such as loneliness, nervousness, sadness, and anxiety. We used the family mean of child EXTs (α s = .71 to .93) and INTs (α s = .78 to .93) at ages 13 and 15, with scores averaged across child, mother, and father reports at each age.

Demographics.—Child gender and average number of years of parents’ education were included in analyses as covariates. Because years of mother and father education were highly correlated ($r = .70$, $p < .01$), the average of these two variables was used in analyses.

Social desirability.—Mothers’ and fathers’ self-reported social desirability were included in all analyses as control variables to lessen the effects of parents’ social desirability bias. Social desirability was measured via the 13-item Social Desirability Scale-Short Form, which has demonstrated reliability and validity across various cultures (Reynolds, 1982). Participants were asked whether each of the items (e.g., “I’m always willing to admit it when I make a mistake”) described them (1 = “Yes”) or did not describe them (0 = “No”). Responses were averaged, with higher scores indicating greater social desirability (α s for mothers = .46 to .68 and α s for fathers = .44 to .73). In particular, only for Italian mothers and Swedish fathers were alphas below .50.

Analysis Plan

We examined the a-priori, theoretically informed hypothesis that parents’ self-efficacy in regulating anger and irritability would predict harsh parenting and child irritability, which in turn predict child externalizing and internalizing symptoms. Analyses proceeded in several steps via Mplus Version 7 (Muthén & Muthén, 2012). First, separately for each construct and reporter, mean scores were computed from all available reports for adolescents’ irritability, EXTs, and INTs, as described above. We computed means scores from all reporters’ perspectives on these constructs *a priori* mainly to avoid inflation of effects due to the use of only the same reporter (i.e., mothers or fathers) reporting on all study constructs.

After mean scores were created, 2 separate initial path models (one for mothers, one for fathers) testing the association of parent education and mother and father social desirability (i.e., covariates) with all study constructs in the same analysis were run. If covariate paths continued to demonstrate significance ($p < .05$) in these principal models, they were retained and are reported in Tables 4 and 5. All other non-significant paths were deleted in the interest of model parsimony and model fit. In sensitivity analyses including these non-significant associations in all analyses, no substantive changes in results occurred, but omnibus measures of model fit (i.e., CFI/TLI, RMSEA) were appreciably worse (probably due to the inclusion of many non-significant covariate paths). Therefore, we report our best-fitting models that deleted such non-significant associations. Furthermore, child gender was included as a covariate with age 13 and 15 externalizing and internalizing problems in all analyses regardless of its significance (see Tables 4 and 5) given its established association with externalizing and internalizing problems.

Then, two separate path models (one for mothers, one for fathers) exploring associations among age 13, age 14, and age 15 measures were estimated utilizing full-information maximum likelihood estimation procedures to handle missing data (Kline, 2011). The structures of these models are depicted in Figures 1 and 2. In each model, contemporaneous measures were correlated in each model as recommended in existing literature (Kline, 2011), and child gender was associated with age 13 and 15 externalizing and internalizing problems. Any covariates that survived the aforementioned initial path analyses were also included in models. Additionally, the effects of age 13 EXTs and INTs on age 15 EXTs and INTs were also controlled for in analyses to ensure significant substantive pathways emerged even after existing child adjustment difficulties were controlled. Mediation effects were calculated using the Model Indirect Mplus procedure. Importantly, age 13 harsh parenting was included in all models as a predictor of age 14 harsh parenting to ensure that any mediational effects from age 13 predictors to age 15 outcomes found through age 14 harsh parenting persisted even after controlling for prior levels of harsh parenting. Our study only measured adolescent irritability at age 14, and therefore we could not directly control for prior levels of irritability in mediational analyses. Internalizing and externalizing symptoms have been also found to be associated with irritability in adolescence (Humphreys et al., 2019). Thus, we included age 13 externalizing and internalizing symptoms as predictors of age 14 adolescent irritability to ensure that mediating pathways through age 14 irritability persisted after controlling for these prior symptoms.

Once path models were fit, multiple-group comparisons of the 12 cultural groups were conducted to examine cultural differences. All paths in each model were initially constrained to be equal across cultures. Then paths were freed to vary across cultures if a χ^2 difference test revealed that the model fit significantly better when the path was freed. Analyzing the data in this way follows established conventions in existing literature (e.g., Kline, 2011) and allowed precise identification of the age-specific pathways that vary across cultural groups.

Results

Table 2 provides descriptive statistics for all substantive study measures. Skewness and kurtosis estimates for all scores fell in acceptable ranges (Curran, West, & Finch, 1996),

suggesting no violation of the assumption of normally distributed indicators. Evaluation of model fit was based upon recommended fit index cut-off values that indicate excellent model fit (Comparative Fit index (CFI)/Tucker-Lewis Index (TLI) cut-off values > 0.95 , Root Mean Square Error of Approximation (RMSEA) cut-off value < 0.05 (Kline, 2011). Table 3 provides zero-order correlations among all study variables in the total sample (correlations within each culture group are available upon request). Standardized parameter estimates and standard errors are provided in Tables 4 and 5, and results are depicted in Figures 1 and 2.

Mother Model

The final model (Table 4; Figure 1) fit the data significantly better than the initial model that was constrained to be equal across groups ($\chi^2 [132] = 288.04, p < .01$). The model fit the data fairly well ($\chi^2 [454] = 672.96, p < .01$, RMSEA = 0.07, CFI = 0.94, TLI = 0.93) and explained significant amounts of variance in age 15 child INT ($R^2 = .20$ to $.60, p < .05$) and EXT ($R^2 = .31$ to $.68, p < .05$) in all cultures. The only covariate effects that were significant at $p < .05$ and thus retained in the final model were the effect of mother social desirability on age 15 adolescent INT and the effect of child gender on age 13 and 15 EXT and INT. In the final model, 5 paths examining prospective associations were freed to vary across all cultures: age 13 EXT predicting age 14 adolescent irritability (1) and age 15 EXT (2); age 13 INT predicting age 15 INT (3), mother social desirability predicting age 15 INT (4), and child gender predicting age 15 INT (5). Importantly, none of the freed paths related to principal study hypotheses. All other pathways depicting prospective associations were constrained to be equal across cultures; allowing such paths to vary did not significantly improve model fit. Below, we organize descriptions of results around the age 13 predictors that mark each indirect pathway.

Mother self-efficacy about anger regulation when adolescents were 13 years old.—Two indirect pathways emerged from mother self-efficacy in anger regulation when adolescents were age 13 to age 15 adolescent outcomes. These indirect pathways were significant in all 12 cultures studied. Age 14 adolescent irritability acted as a suppressor of effects of age 13 maternal self-efficacy about anger regulation on both age 15 adolescent INTs and EXTs: The effect of age 13 maternal self-efficacy on decreases in INTs and EXTs were larger when one accounts for age 14 adolescent irritability. Direct effects of age 13 maternal self-efficacy on INTs (direct effect $\beta = .02$ to $.04, p = .45$ across cultures) and EXTs (direct effect $\beta = .02$ to $.04, p = .36$ across cultures) were positively valenced and non-significant, whereas indirect effects via age 14 adolescent irritability on INTs (indirect effect $\beta = -.01, p = .05$ across cultures except China, where $p = .06$) and EXTs (indirect effect $\beta = -.01, p = .04$ across cultures) were negatively valenced and significant. In other words, higher maternal self-efficacy about anger regulation predicted lower adolescent irritability, which in turn predicted lower adolescent EXTs and INTs. Interestingly, there was no significant mediating pathway from maternal self-efficacy about anger regulation through maternal harsh parenting to either INTs or EXTs. This is probably because age 13 mother self-efficacy about anger regulation was not a significant predictor of age 14 maternal harsh parenting after accounting for the effects of age 13 mother harsh parenting and irritability on age 14 maternal harsh parenting. Finally, it is important to note that no direct effects of mothers' self-efficacy about anger regulation on age 15 adolescent outcomes were

significant. Therefore, the association between mother self-efficacy about anger regulation and age 15 adolescent outcomes appeared to be fully accounted for by age 14 adolescent irritability.

Mother irritability when adolescents were 13 years old.—In all cultures, the four indirect pathways from mother irritability when adolescents were 13 years old to age 15 adolescent outcomes were significant. Greater mother irritability at age 13 predicted greater adolescent irritability at age 14, which predicted more severe adolescent INTs (indirect effect β s = .01 to .03, $p < .01$ across cultures) and EXTs (indirect effect β s = .01 to .03, $p < .01$ across cultures) at age 15. Greater mother irritability at age 13 predicted greater mother harsh parenting at age 14, which predicted more severe adolescent EXTs (Indirect Effect β s = .01 to .03, $p < .01$ across cultures) and INTs (indirect effect β s = .01 to .04, $p = .03$ to .04 across cultures) at age 15. The direct effects of age 13 mother irritability on age 15 adolescent outcomes were non-significant, so the aforementioned pathways appeared to be fully mediated.¹

Because age 13 EXTs and INTs functioned primarily as control variables in the present model, and potential mediating pathways emerging from these predictors through mediators measured at age 14 to age 15 outcomes have been firmly established in existing literature, we included those results only in Figure 1 and in Table 4 and do not report them in the text. Contemporaneous measures were significantly correlated in all cultures (Figure 1).

Cultural differences in covariates.—All aforementioned significant mediating pathways were both significant and virtually identical in magnitude across cultures. However, there were differences across cultures in other pathways involving study covariates. Two pathways were significantly different in magnitude albeit were significant in all groups. Specifically, the effects of age 13 adolescent EXTs on age 15 EXTs (β s = .39 to .71, $p < .01$), as well as the effect of age 13 adolescent INTs on age 15 adolescent INTs (β s = .39 to .71, $p < .01$), varied moderately in magnitude but not significance across culture (Table 4). Additionally, three pathways were significant in some cultures but not others. Specifically, the effect of age 13 EXTs on age 14 adolescent irritability was significant in every culture except Colombia and Jordan. Boys scored lower than girls in age 15 INTs only in Naples, Italy as well as the US European American, African American, and Latin American samples. Maternal social desirability predicted lower age 15 INTs in the Jordan, US European American, and US Latin American samples only.

Father Model

The final model (Table 5; Figure 2) fit the data significantly better than the initial model that was constrained to be equal across groups ($\chi^2 [88] = 248.33$, $p < .01$). The model fit the data

¹There was no item overlap between the irritability and externalizing problem behavior scales (i.e., no items were quite similar on both scales) except for one item in the CBCL for both mother and father reports, namely “Stubborn, sullen, or irritable” in the aggression scale. To support the very minor overlap between such study constructs, the path between irritability and the CBCL/YSR delinquency items (not involving emotionality), as opposed to the entire CBCL/YSR externalizing scale (EXT; which includes both delinquency and aggression items) was examined in sensitivity analyses utilizing simple regression models. Irritability prospectively predicted higher scores on the larger EXT ($B = .75$, $p < .01$) and on the delinquency items only ($B = .70$, $p < .01$) at virtually identical levels. Therefore, it does not appear that the significant path from adolescent irritability to adolescent EXT in this sample is due to item overlap or similarity.

well ($\chi^2 [382] = 544.22, p < .01, RMSEA = 0.06, CFI = 0.95, TLI = 0.94$) and explained significant amounts of variance in age 15 child INT ($R^2 = .18$ to $.68, p < .05$) and EXT ($R^2 = .31$ to $.67, p < .05$) in all cultures. The only covariate effect that was significant at $p < .05$ and thus retained in the final model was the effect of child gender on father harsh parenting at age 14 (Table 5). In all cultures, father harsh parenting was higher for boys than girls. In the final model, three indirect paths examining prospective associations were freed to vary across cultures: (1) age 13 INTs and (2) child gender predicting age 15 INTs; and (3) age 13 EXTs predicting age 15 EXTs. All other pathways depicting prospective associations were constrained to be equal across cultures because freeing such paths to vary did not significantly improve model fit. We once again organize our results descriptions around the age 13 predictors.

Father self-efficacy about anger regulation when adolescents are 13 years old.

—No significant indirect or direct paths were found from fathers' self-efficacy in anger regulation when adolescents were age 13 to age 15 adolescent outcomes in any culture.

Father irritability when adolescents are 13 years old.—Analysis of indirect effects indicated that in every cultural group adolescent irritability at age 14 mediated the effect of age 13 father irritability on both adolescent INTs (Indirect Effect $\beta s = .02$ to $.03, p < .01$ across cultures) and EXTs (Indirect Effect $\beta s = .02$ to $.03, p < .01$ across cultures) at age 15. Greater father irritability at age 13 predicted greater adolescent irritability at age 14, which predicted more INTs and EXTs at age 15. The third significant indirect pathway ran through age 14 harsh parenting. In all cultures, age 14 father harsh parenting mediated the effect of age 13 father irritability on age 15 adolescent EXTs (Indirect Effect $\beta = .01, p = .04$ across cultures). Greater father irritability at age 13 predicted greater father harsh parenting at age 14, which predicted more EXTs at age 15. There was no significant indirect pathway from age 13 father irritability through age 14 father harsh parenting to age 15 INTs. Direct effects of age 13 father irritability on age 15 adolescent outcomes were non-significant. Therefore, the association between father irritability at age 13 and age 15 adolescent outcomes appeared to be fully mediated by age 14 adolescent irritability and father harsh parenting. Moreover, potential mediating pathways emerging from age 13 EXTs and INTs to adolescent outcomes are reported in Figure 2 and in Table 5 (contact first author for greater detail on such pathways).

Contemporaneous measures were significantly correlated in all cultures (Figure 2). Specifically, age 13 father self-efficacy about anger regulation and father irritability were significantly negatively correlated, age 14 father harsh parenting and adolescent irritability were significantly positively correlated, and age 15 adolescent EXTs and INTs were significantly positively correlated in all cultures.

Cultural differences in covariates.—All aforementioned significant mediating pathways were both significant and virtually identical in magnitude across cultures. However, there were differences across cultures in other pathways involving study covariates. Three pathways were significantly different in magnitude albeit were significant in all groups. Specifically, the effects of age 13 adolescent EXTs on age 15 EXTs ($\beta s = .42$ to $.73, p < .01$), as well as the effect of age 13 adolescent INTs ($\beta s = .39$ to $.14, p < .01$) and

child gender (β s = $-.03$ to $-.05$, $p > .05$) on age 15 adolescent INTs varied moderately in magnitude but not in significance across culture (Table 5). Additionally, the effects of child gender on age 15 INTs were only significant in the Naples, Italy, Colombian, and US European American, African American, and Latin American groups. In these groups, girls experienced greater age 15 INTs than boys (Table 5).

Finally, a set of sensitivity analyses comparing competing models is reported as supplemental material. It appeared that our theoretically-derived path analyses reported in the results are superior to more complex but atheoretical, exploratory models.

Discussion

The present study found that mothers and fathers with higher irritability, as well as mothers with lower self-efficacy beliefs about anger regulation, were more prone to use harsh parenting and had adolescent children who were also high in irritability, which in turn was associated with adolescent externalizing (EXTs) and internalizing (INTs) problems. These results were examined in a cross-cultural sample (12 cultural groups within nine countries), and more similarities than differences emerged across cultures.

Existing theoretical frameworks have identified mechanisms by which parent emotional expressiveness and emotion socialization might affect child adjustment: child observational learning from parent models, parenting practices, and the family climate (Eisenberg et al., 1998; Morris et al., 2007). Additionally, extant work is consistent with the view that specific parenting practices (i.e., harsh parenting) can have especially deleterious effects on child anger expression and adjustment (Lansford et al., 2014). Moreover, existing studies have identified that differences in the family climate-related indicators, for example, between mothers' and fathers' self-efficacy beliefs about anger regulation, predict differences in child emotional expression and adjustment (Di Giunta et al., 2018). However, no researchers have simultaneously examined the predictive effects of all three of these mechanisms on child adjustment, or examined similarities and differences across cultures in the developmental pathways by which these mechanisms might affect adolescent adjustment. The present study attempted to fill these gaps in the literature by simultaneously examining the direct and indirect associations of parental irritability and parents' self-efficacy in their ability to regulate their anger with adolescent EXTs and INTs two years later, through harsh parenting and adolescent irritability. Moreover, cultural differences were also tested by examining differences and similarities in mother and father pathways in 12 different cultural groups embedded in nine countries. Even though the examined models included all the paths between predictors, mediators, and outcomes for each parent, for the sake of simplicity the discussion is organized in sections considering separate mediational pathways.

Maternal and Paternal Self-Efficacy about Anger Regulation and Irritability->adolescents' Irritability-> Adolescents' Maladjustment

Adolescent irritability at age 14 significantly mediated associations of mothers' and fathers' irritability with age 15 adolescent adjustment, and acted as a suppressor of the association between mothers' self-efficacy beliefs about anger regulation at age 13 with adolescent adjustment at age 15. These indirect paths were invariant across the 12 examined cultural

groups. These results are consistent with the theory of parental emotion socialization by Eisenberg et al. (1998) because they provide cross-cultural empirical support for the hypothesis that parents' personal emotional tendencies implicitly teach adolescents which emotions and self-management strategies are appropriate (and perhaps affect learning due to effects on children's arousal in socialization contexts) and, consequently, predict adjustment over time.

Thus, the present study sheds new light on the mechanisms by which parents in diverse cultures might socialize anger/irritability in their adolescents. By observing their parents' tendency to be angry and reactive to the provocations/disagreements, adolescents might learn what is 'expected' and what might be acceptable for them to do in analogous situations they encounter in their own lives. In addition, invariantly across cultures, stronger maternal, but not paternal, self-efficacy beliefs about anger regulation were associated with less adolescent irritability, which in turn predicted adolescents' adjustment. Mothers who do not believe they can regulate their own anger, and who feel ready to explode at minimum provocation, might implicitly teach their children that it is acceptable to lose control in the face of provocative circumstances. Alternatively (or in addition), such mothers may implicitly communicate that adolescents cannot expect to have the resources to manage their own anger, which could undermine their motivation or confidence. In regard to the different patterns for mothers and fathers, mothers spend more time with their children in physical and nonphysical care whereas fathers spend more time with children in play (Bonney, Kelley, & Levant, 1999). Thus, in comparison to fathers, mothers might be more likely to experience stressful situations in which their competence to handle angry/irritable feelings is tested in the presence of their children. Moreover, there may be fewer opportunities for adolescents to observe fathers' self-efficacy beliefs about anger regulation. Thus, mothers might be more accessible, salient models for adolescents' learning regarding how to regulate their own angry/irritable emotions in evocative situations.

Maternal and Paternal Self-Efficacy about Anger Regulation and Irritability->Harsh Parenting-> Adolescents' Maladjustment

Mothers and fathers who were higher in irritability and mothers (but not fathers) who were lower in self-efficacy in anger regulation when adolescents were age 13, tended to engage harsher parenting when their children were 14. In turn, those harsh parenting practices predicted more severe adolescent EXTs and INTs at age 15. Importantly, all mediated paths were invariant across the 12 examined cultural groups. In line with previous models (Bandura, 1997; Belsky, 1984; Eisenberg et al., 1998; Morris et al., 2007), the current results indicate that both the emotional competencies of parents (i.e., irritability, anger regulation beliefs) and parent practices related to emotion socialization (i.e., harsh parenting) might act together as developmental determinants of adolescents' EXTs and INTs. Our results further validate previous cross-cultural studies that have already established high rates of negative parenting practices (e.g., corporal punishment, low warmth) as universal mechanisms predicting the likelihood of child EXTs and INTs (e.g., Lansford et al., 2018). However, this study uniquely builds upon these findings by highlighting that such cross-cultural relations held not only in late childhood (e.g., Lansford et al., 2005; 2018), but also in the transition into and through adolescence.

Age 13 EXTs and INTs primarily functioned as control variables in the current study, and close examination of developmental pathways emerging from these age 13 predictors was beyond the scope of the present study. However, it is useful to highlight that, consistent with existing theoretical models that support bidirectional associations between parents' and children's behaviors, as well as between children's characteristics and behaviors (Bandura, 1997; Belsky, 1984; Eisenberg et al., 1998; Morris et al., 2007), our data support, across cultures, the view that adolescents' EXTs and INTs predict an increase across time in both maternal harsh parenting and adolescent irritability. Specifically, this study suggests that, in many cultures, the more adolescents experience emotional and behavioral problems, the more challenging it might be for parents to handle such problems, presumably leading parents to more frequently engage in harsh parenting. Because mothers are the primary caregivers in most cultures, maternal, as opposed to paternal, harsh parenting may be especially affected by these evocative adolescent behaviors. Moreover, a high degree of problem behaviors in early adolescence may, over time, render adolescents more vulnerable to losing control easily. These findings merit further examination to understand the sources of cultural similarities and differences in such relationships. Furthermore, similarly across cultures, stronger maternal and paternal self-efficacy beliefs about anger regulation were correlated with lower irritability, and each of those variables uniquely predicted parenting quality and adolescent functioning. This result supports cross-cultural validity for the association between parental self-efficacy about emotion regulation and quality of parenting, as well as socioemotional functioning of adolescents.

Mothers, Fathers, and Adolescents' Emotional Functioning Around the World

The results of the present study advance the literature by examining the associations among mothers' and fathers' irritability, maternal and paternal harsh parenting, and their adolescent children's socioemotional functioning in nine different countries (China, Colombia, Italy, Jordan, Kenya, Philippines, Sweden, Thailand, and United States). This represents an important attempt to increase external validity of our findings, deviating from the typical Western, educated, industrialized, rich, and democratic (WEIRD) research participants that most often characterize developmental studies (Henrich et al., 2010). Overall, the associations among maternal self-efficacy about anger regulation, irritability, harsh parenting, and adolescents' emotional and behavioral development were similar cross-culturally. In this sense, this study contributes to the external validity of the well-known impact of maternal emotionality on children's emotionality, which in turn affects adolescent development. Differently, and more innovatively, this study adds knowledge about how, similar to mothers, fathers' emotionality is related to adolescents' emotionality and socioemotional development. Relations among fathers' irritability, harsh parenting, and adolescents' adjustment were similar cross-culturally.

Overall this study suggests similarities, and not differences, in the ways in which both mothers' and fathers' anger/irritability-related characteristics (e.g., whether they tend to easily lose control, or whether they believe themselves to be able to handle angry feelings in challenging situations from their daily life) and harsh discipline (e.g., spanking, yelling) could affect adolescents' emotional and behavioral development. In addition, acknowledging the increase in risk of psychopathology around the world in the last decade, especially in

adolescence, and that risk of psychopathology in adolescence often precedes the emergence of psychiatric disorders in adulthood (e.g., Lancet Editorial, 2017), this study contributes by strengthening the effort to determine if fostering parents' emotion regulation promotes adolescents' well-being around the world.

Strengths and Limitations

Strengths of the study include the multi-informant approach and the longitudinal design that allowed us to examine prospective associations among some variables (i.e., parents' self-efficacy about emotion regulation and early adolescents' behavioral problems) which provides a more stringent test of mediation than does the use of cross-sectional data. Other strengths are the large sample size, inclusion of families in 9 countries, inclusion of mothers and fathers, and inclusion (when justified) of statistical controls for child age, parental education, social desirability, and initial levels of adolescents' EXTs and INTs.

However, our study also has several notable limitations that must be acknowledged. First, although the study's longitudinal nature is a strength, the current investigation did not measure parental irritability or self-efficacy beliefs before adolescents were age 13. The extent to which earlier parent and child emotional regulatory capacities and expressions influence parenting practices, child emotion expression, and child adjustment is unknown. Similarly, adolescent irritability was not directly measured before age 14. Therefore, we could not control for prior levels of irritability when examining mediational effects through age 14 irritability, casting some doubt on the directionality of mediational associations. However, we did control for associations between age 14 irritability and age 13 externalizing and internalizing problems (which are significant cross-sectional and longitudinal predictors of irritability; Humphreys et al., 2018) to control for prior levels of irritability via proxy variables. Therefore, we believe the directionality of mediational prediction through adolescent irritability can be interpreted with some confidence. Second, although cultural and socioeconomic diversity in this sample is a notable strength, subsamples were not fully representative of the countries in which they were embedded. Therefore, results should not be generalized to reflect country-wide effects. Third, this study employed survey data (not observational measures) of parents' and adolescents' characteristics and behaviors. Fourth, we acknowledge that a certain degree of heredity of emotion regulation-related characteristics is transmitted from parents to their offspring (e.g., Borkenau et al., 2001). Thus, our finding that irritable parents tend to have irritable children, and irritable children have more psychological problems, could be due to untested genetic effects. Future studies utilizing genetic or polygenic risk scores could disaggregate genetic and parental modeling effects. Fifth, parental irritability was self-reported, and did not include child or partner reports of a parent's irritability. Future studies could incorporate multiple reporters' perspectives about parental irritability, as well as indicators about parental emotion regulation. Sixth, the measure of social desirability used in this study showed low alpha in some of the participating countries; future studies should include a measure of social desirability that shows higher internal reliability cross-culturally than the one we used in this study. However, it is important to acknowledge that we ran the main analysis without social desirability, and the results remained the same. Seventh and finally, to prevent self-report bias and align with prior research, we combined all available reports of adolescents'

irritability, externalizing behavior, and internalizing behavior. However, doing so could have obscured differences across reporters; future work could investigate single-reporter perspectives.

Future Directions, Implications, and Conclusions

The findings of the present study support the broad generalizability of the association of parental irritability with both harsh parenting and adolescents' irritability, as well as of maternal self-efficacy with both maternal harsh parenting and adolescents' irritability, which in turn predicted adolescents' maladjustment (Eisenberg et al., 1998; Morris et al., 2007). We found more similarities than differences across cultures. Adolescents' own self-efficacy beliefs about anger regulation were not measured in the current study. Such beliefs might protect against the emergence of EXTs and INTs, even in the face of deleterious parental irritability, low parental self-efficacy about anger regulation, and high adolescent irritability. Future studies should investigate the mediating role of adolescents' self-efficacy beliefs about emotion regulation, as well as adolescents' irritability, in the association between correspondent beliefs in their parents and adolescents' adjustment. Indeed, after regularly witnessing their parents' low self-efficacy beliefs about emotion regulation, adolescents may eventually come to believe that similar cognitions are expected of them and that they are incapable of dealing with their own emotions. Furthermore, experiencing EXTs and INTs may be interpreted by adolescents as evidence of the failure of personal psychosocial functioning, which in turn might hinder the development of self-evaluations of being competent in dealing with negative emotions in challenging situations. Indeed, among the main sources of information that influence perception of self-efficacy, mastery experience, namely the actual performance of a behavior or task, is believed to be the most powerful source of information influencing self-efficacy (Bandura, 1997).

A better understanding of parents' and adolescents' self-efficacy beliefs in the domain of emotion regulation, parents' and adolescents' emotionality related characteristics, and experienced harsh parenting may further advance scientists' and practitioners' abilities to identify, prevent, and ameliorate the antecedents and negative consequences of poor psychological adjustment in adolescence. Given that parents' self-efficacy beliefs about emotion regulation are closely aligned with techniques already used in psychosocial interventions for adults and adolescents (e.g., Caprara et al., 2015), clarifying the influence of parents' self-efficacy beliefs about emotion regulation could have clear translatable implications for enhancing existing empirically-based intervention methods. In particular, the findings of the present study should encourage experimental interventions that test causal relations in a more rigorous manner and encourage genetically informed studies of these relations. Such interventions could test whether promoting parents' self-efficacy beliefs in dealing with anger in their daily life and parenting practices other than harsh discipline may result in improvements in their adolescent children's misbehaviors (e.g., Muratori et al., 2018). In addition, taking into consideration what recent studies report about developmental psychopathology and its relevance for understanding adolescent behavior in these times of change (Shulman & Scharf, 2018), interventions that take into account our results might boost cross-cultural resilience research designed to elucidate processes contributing to positive development under conditions of adversity (Luthar & Cicchetti, 2000). Finally, this

study suggests a novel aspect to be included in the model of parental socialization of emotions by Eisenberg et al. (1998), namely parental self-efficacy about anger regulation. In addition, the findings from this study support the prediction in Eisenberg and her colleagues' model (1998) that child temperament is an important predictor of parenting, and support the external validity of the model across multiple diverse cultures.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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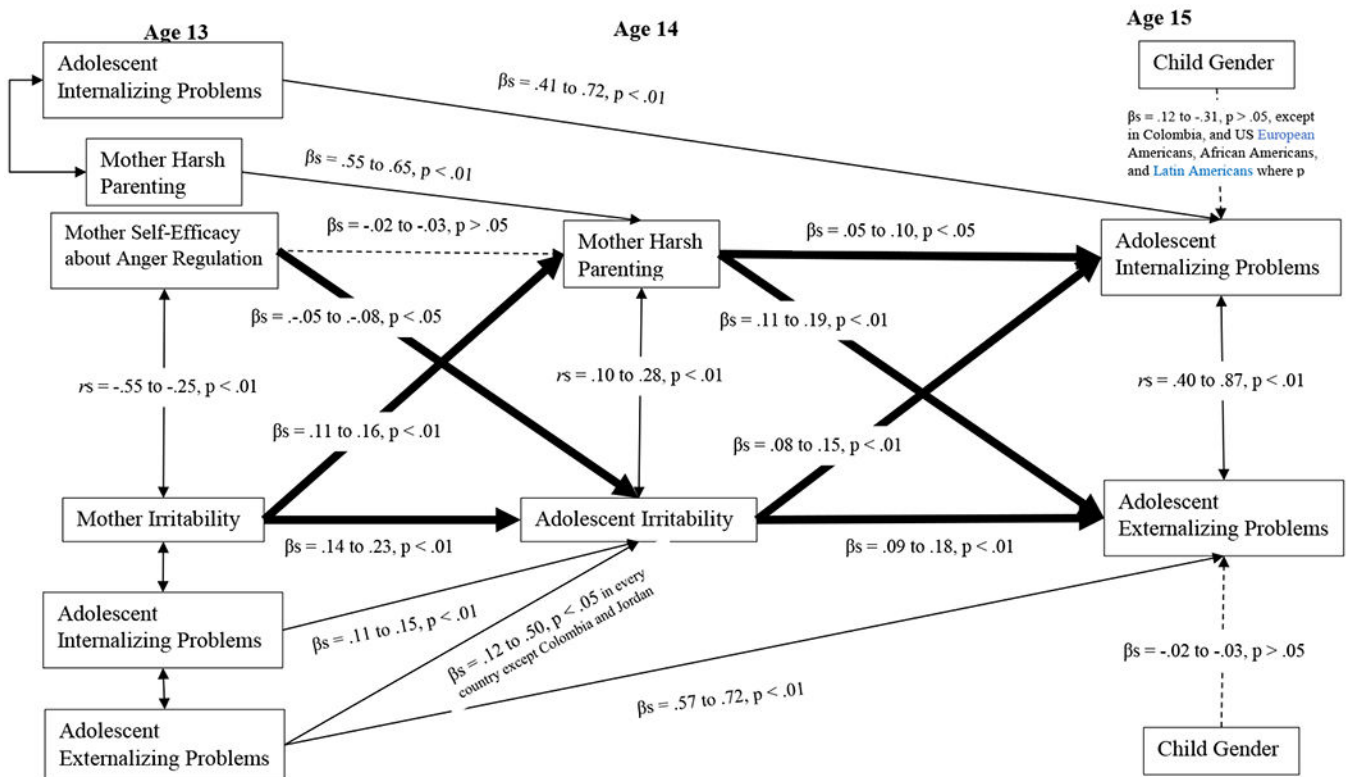


Figure 1. Model depicting pathways between mother and adolescent characteristics at adolescent ages 13, 14, and 15. Solid lines indicate significant paths in all cultural groups, dashed lines indicate non-significant paths in some or all cultural groups. Bolded lines indicate mediating pathway among principal study measures. If some cultural groups significant and some non-significant, non-significant groups this is noted beside the parameter estimate. See Table 4 for complete parameter estimates for every cultural group. Range of significant standardized effects estimates across all 12 cultural groups reported. Paths between age 13 mother self-efficacy about anger regulation and irritability and age 15 externalizing/internalizing problems and paths from mother social desirability and education were controlled for but not depicted here due to space (see Table 4 for these results). The same age 13 adolescent internalizing problems variable is listed twice on the left side of the figure merely so that all paths from this variable can be accurately depicted.

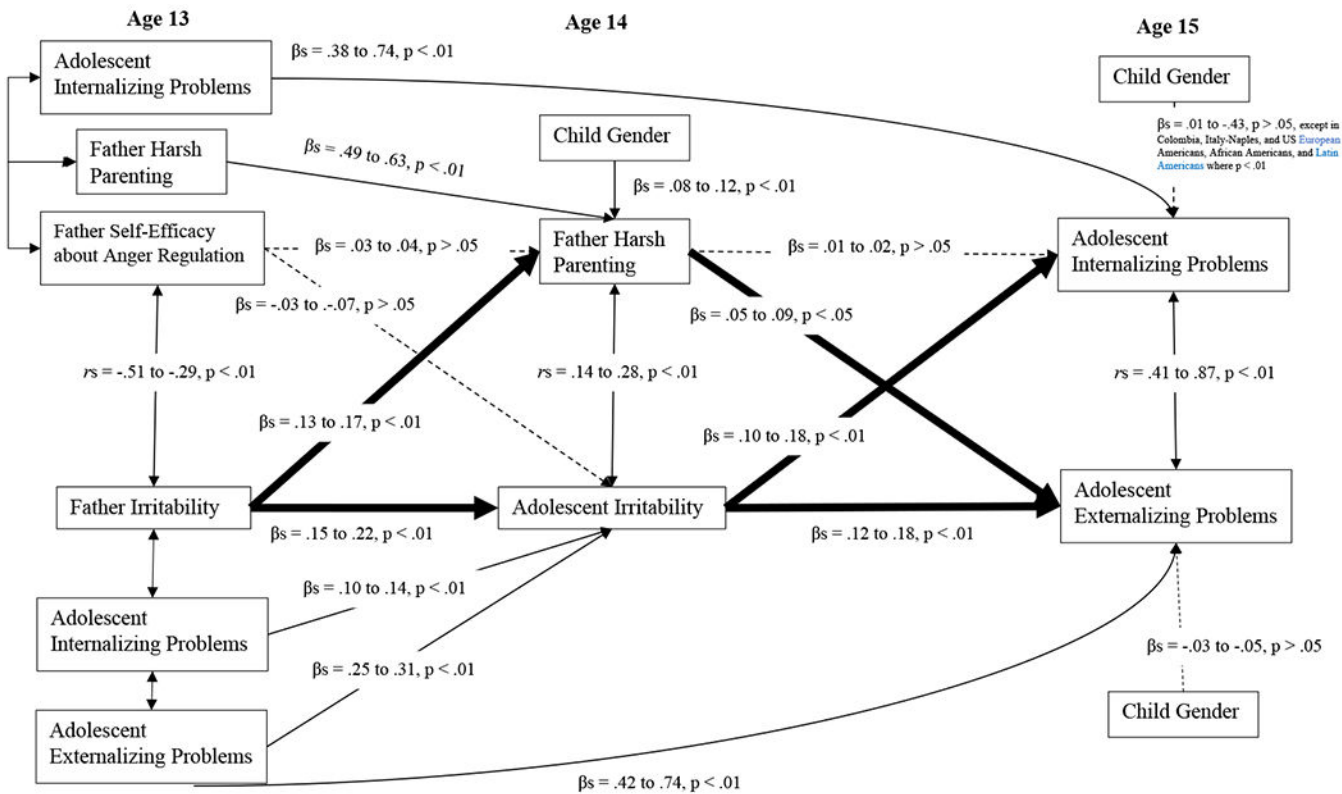


Figure 2. Model depicting pathways between father and adolescent characteristics at adolescent ages 13, 14, and 15. Solid lines indicate significant paths, dashed lines indicate non-significant paths. Bolded lines indicate mediating pathway among principal study measures. If some cultural groups significant and some non-significant, non-significant groups this is noted beside the parameter estimate. See Table 4 for complete parameter estimates for every cultural group. Range of significant standardized effects estimates across all 12 cultural groups reported. Paths between age 13 father self-efficacy about anger regulation and irritability and age 15 externalizing/internalizing problems were controlled for but not depicted here due to space (see Table 5 for these results). The same age 13 adolescent internalizing problems variable is listed twice on the left side of the figure merely so that all paths from this variable can be accurately depicted.

Table 1

Descriptive Statistics for Demographics by Cultural Group

Group	Mother's Age at Age 13 Time-point	Mother's Education	Father's Age at Age 13 Time-point	Father's Education	Child Gender (% girls)	Child Age at "Age 13" (years)	Time-point
Shanghai, China	38.64 (3.28)	13.16 (3.22)	41.19 (3.70)	13.71 (3.36)	50	11.60 (.50)	
Medellin, Colombia	41.25 (5.87)	9.85 (4.65)	44.79 (7.30)	9.42 (4.68)	56	13.40 (.59)	
Naples, Italy	42.99 (5.42)	10.72 (4.29)	45.90 (5.52)	10.90 (4.01)	52	13.52 (.39)	
Rome, Italy	45.01 (5.29)	12.93 (5.20)	48.38 (6.03)	13.08 (5.38)	47	13.55 (.78)	
Zarqa, Jordan	41.31 (5.87)	13.23 (2.73)	45.50 (5.83)	13.68 (2.97)	47	12.71 (.31)	
Kisumu, Kenya	37.16 (6.74)	10.81 (3.76)	43.24 (6.82)	12.51 (3.44)	60	13.04 (.92)	
Manila, Philippines	43.59 (6.52)	13.13 (4.46)	43.95 (7.38)	13.28 (3.88)	49	12.57 (.44)	
Trollhättan, Sweden	42.42 (4.30)	14.15 (2.75)	44.84 (4.53)	13.79 (2.60)	50	12.47 (.27)	
Chiang Mai, Thailand	43.59 (6.52)	12.61 (4.28)	45.63 (7.86)	13.09 (4.23)	49	13.61 (.59)	
U.S. African American	42.30 (9.34)	14.01 (2.90)	43.07 (8.10)	13.66 (2.55)	52	13.95 (.66)	
U.S. European American	46.03 (6.01)	16.87 (3.81)	47.12 (5.90)	16.99 (3.84)	42	14.04 (.59)	
U.S. Latin American	38.43 (5.90)	10.47 (3.76)	41.72 (7.62)	10.04 (4.10)	53	13.81 (.71)	

Note. Mother's and father's education = mean number of years of education completed. All numbers in parentheses are standard deviations.

Table 2.

Descriptive Statistics for Substantive Measures, Full Sample (N = 1,298).

	Mean	SD
Age 13 Measures		
Mother Social Desirability	8.71	2.38
Father Social Desirability	8.72	2.58
Mother Harsh Parenting	2.36	0.82
Father Harsh Parenting	2.13	0.75
Mother Self-Efficacy about Anger Regulation	3.27	0.81
Father Self-Efficacy about Anger Regulation	3.36	0.78
Mother Irritability	1.90	1.19
Father Irritability	1.63	1.13
Adolescent Externalizing Problems (mother-report)	0.27	0.23
Adolescent Externalizing Problems (father-report)	0.25	0.21
Adolescent Externalizing Problems (adolescent-report)	0.50	0.33
Adolescent Externalizing Problems (multi-informant)	0.34	0.20
Adolescent Internalizing Problems (mother-report)	0.30	0.24
Adolescent Internalizing Problems (father-report)	0.27	0.22
Adolescent Internalizing Problems (adolescent-report)	0.45	0.30
Adolescent Internalizing Problems (multi-informant)	0.29	0.19
Age 14 Measures		
Mother Harsh Parenting	2.28	0.81
Paternal Harsh Parenting	2.28	0.81
Adolescent Irritability (mother-report)	2.56	0.93
Adolescent Irritability (father-report)	2.47	0.88
Adolescent Irritability (multi-informant)	2.52	0.81
Age 15 Measures		
Adolescent Externalizing Problems (mother-report)	0.27	0.23
Adolescent Externalizing Problems (father-report)	0.25	0.21
Adolescent Externalizing Problems (adolescent-report)	0.50	0.33
Adolescent Externalizing Problems (multi-informant)	0.28	0.19

	Mean	SD
Adolescent Internalizing Problems (mother-report)	0.23	0.22
Adolescent Internalizing Problems (father-report)	0.21	0.22
Adolescent Internalizing Problems (adolescent-report)	0.38	0.25
Adolescent Internalizing Problems (multi-informant)	0.36	0.22

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Table 3

Correlation matrix of study variables across the entire sample

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Age 13 Mother Self-Efficacy about Anger Regulation	1.00																
2. Age 13 Father Self-Efficacy about Anger Regulation	.27*	1.00															
3. Age 13 Mother Irritability	-.40*	-.07	1.00														
4. Age 14 Father Irritability	-.16*	-.36*	.28*	1.00													
5. Mother Social Desirability	.26*	.03	-.28*	-.12*	1.00												
6. Father Social Desirability	.04	.19*	-.06	-.26*	.26*	1.00											
7. Parent Education	.03	.07	-.10*	.01	-.05	-.22*	1.00										
8. Age 13 Adolescent Externalizing Problems	-.19*	-.19*	.34*	.35*	-.15*	-.13*	-.09*	1.00									
9. Age 13 Adolescent Internalizing Problems	-.13*	-.16*	.30*	.29*	-.20*	-.14*	-.09*	.61*	1.00								
10. Adolescent Gender	.02	.05	-.01	.01	.00	.05	.01	-.08 [†]	.13*	1.00							
11. Age 14 Mother Harsh Parenting	-.30*	-.13*	.45*	.27*	-.14*	-.09 [†]	-.08 [†]	.47*	.26*	-.04	1.00						
12. Age 14 Father Harsh Parenting	-.17*	-.22*	.19*	.36*	-.05	-.16*	.00	.41*	.22*	-.16*	.50*	1.00					
13. Age 14 Adolescent Irritability	-.24*	-.18*	.34*	.30*	-.19*	-.15*	.01	.45*	.38*	.00	.40*	.37*	1.00				
14. Age 15 Adolescent Externalizing Problems	-.19*	-.15*	.30*	.30*	-.13*	-.12*	-.10*	.72*	.45*	-.01	.48*	.38*	.44*	1.00			
15. Age 15 Adolescent Internalizing Problems	-.12*	-.11*	.21*	.19*	-.20*	-.08 [†]	-.07 [†]	.34*	.64*	.22*	.24*	.14*	.35*	.57*	1.00		
16. Age 13 Mother Harsh Parenting	-.31*	-.16*	.48*	.25*	-.17*	-.06	-.07 [†]	.55*	.33*	.05	.74*	.47*	.41*	.48*	.24*	1.00	
17. Age 13 Father Harsh Parenting	-.13*	-.22*	.21*	.33*	-.06	-.13*	-.02	.44*	.28*	.12*	.42*	.68*	.27*	.35*	.17*	.48*	1.00

Note:

[†] *p* .05;

* *p* .01

Mother Path Model Results

Table 4

Paths	Cultural Group																	
	China	Colombia	Italy-Naples	Italy-Rome	Jordan	Kenya	Philippines	Sweden	Thailand	US-AA	US-EA	US-LA						
	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE				
Predicting Age 14 Adolescent Irritability from Age 13 Measures																		
Mother Self-Efficacy Anger ^A	-.08 [†]	.04	-.06 [†]	.03	-.08 [†]	.03	-.07 [†]	.03	-.08 [†]	.04	-.08 [†]	.04	-.05 [†]	.02	-.07 [†]	.03	-.08 [†]	.04
Mother Irritability ^A	.20*	.04	.14*	.03	.17*	.03	.17*	.04	.18*	.03	.16*	.03	.16*	.03	.14*	.03	.17*	.04
Adolescent Internalizing ^A	.13*	.04	.12*	.04	.12*	.04	.13*	.04	.13*	.03	.11*	.03	.12*	.04	.15*	.04	.12*	.04
Adolescent Externalizing ^B	.36*	.14	.14	.10	.33*	.08	.32*	.08	.27*	.09	.44*	.09	.35*	.08	.26 [†]	.11	.50*	.08
Predicting Age 14 Mother Harsh Parenting from Age 13 Measures																		
Mother Self-Efficacy Anger ^A	-.03	.03	-.02	.02	-.02	.02	-.02	.03	-.03	.03	-.03	.03	-.03	.03	-.03	.03	-.03	.03
Mother Irritability ^A	.16*	.04	.13*	.03	.11*	.02	.13*	.03	.14*	.03	.13*	.04	.15*	.03	.13*	.03	.14*	.03
Mother Harsh Parenting ^A	.65*	.05	.55*	.04	.59*	.04	.59*	.04	.62*	.04	.60*	.04	.62*	.04	.65*	.04	.58*	.04
Predicting Age 15 Adolescent Internalizing Problems from Age 13 and 14 Measures																		
Adolescent Irritability ^A	.08*	.03	.10*	.03	.09*	.03	.10*	.03	.15*	.04	.10*	.03	.11*	.03	.08*	.02	.10*	.03
Age 14 Mother Harsh Parenting ^A	.06*	.02	.06 [†]	.03	.08 [†]	.03	.07*	.03	.10 [†]	.04	.08 [†]	.03	.07 [†]	.03	.05*	.02	.07 [†]	.03
Mother Self-Efficacy Anger ^A	.02	.03	.02	.02	.02	.03	.02	.02	.04	.05	.02	.03	.02	.03	.02	.02	.03	.03

Paths	Cultural Group																
	China	Colombia	Italy-Naples	Italy-Rome	Jordan	Kenya	Philippines	Sweden	Thailand	US-AA	US-EA	US-LA					
Mother Irritability ^A	β	-.04	.03	-.04	.03	-.04	.03	-.03	.02	-.05	.04	-.04	.03	-.03	.02	-.04	.03
Adolescent Internalizing ^B	β	.41*	.06	.70*	.05	.72*	.05	.40*	.07	.35*	.16	.59*	.06	.54*	.08	.44*	.07
Mother Social Desirability ^B	β	-.06	.10	.07	.08	-.02	.06	-.18	.08	-.08	.08	-.11	.08	.12	.08	-.09	.07
Child Gender ^B	β	.00	.09	-.15	.07	-.07	.06	-.10	.07	-.04	.08	.00	.07	-.08	.08	-.27	.07
Total R ²		.22 [†]	.10	.51*	.08	.59*	.06	.24*	.06	.20*	.07	.43*	.07	.37*	.08	.36*	.06
Predicting Age 15 Adolescent Externalizing Problems from Age 13 and 14 Measures																	
Adolescent Irritability ^A	β	.11*	.03	.13*	.03	.14*	.03	.12*	.03	.09*	.02	.18*	.04	.13*	.03	.10*	.02
Age 14 Mother Harsh Parenting ^A	β	.13*	.03	.14*	.03	.19*	.03	.15*	.03	.13*	.02	.21*	.04	.18*	.03	.14*	.03
Mother Self-Efficacy Anger ^A	β	.02	.03	.02	.02	.03	.02	.02	.02	.04	.04	.03	.03	.03	.03	.02	.02
Mother Irritability ^A	β	-.01	.03	-.01	.02	-.01	.02	-.01	.02	-.01	.04	-.01	.03	-.01	.02	-.01	.02
Adolescent Externalizing ^B	β	.57*	.08	.63*	.06	.63*	.05	.71*	.04	.62*	.05	.39*	.08	.65*	.04	.72*	.04
Child Gender ^A	β	-.03	.03	-.02	.02	-.03	.03	-.03	.02	-.03	.03	-.03	.02	-.03	.03	-.03	.02
Total R ²		.48*	.10	.51*	.08	.61*	.06	.69*	.05	.48*	.06	.31*	.08	.61*	.06	.68*	.05

Note:

[†] *p* .05;

* *p* .01.

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US-AA = US African American sample. US-EA = US European American sample. US-LA = US Latin American sample. “Mother Self-Efficacy Anger” indicates measure of mother self-efficacy about anger regulation. Coefficients are standardized.

^AParameter was constrained to equality across cultural groups without significantly worsening model fit; slight variation in parameter estimates across cultural groups arises in the context of standardized coefficients.

^BParameter was not constrained to equality across cultural groups to improve model fit.

Table 5

Father Path Model Results

Paths	Cultural Group																											
	China	Colombia	Italy-Naples	Italy-Rome	Jordan	Kenya	Philippines	Sweden	Thailand	US-AA	US-EA	US-LA																
	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE														
Predicting Age 14 Adolescent Irritability from Age 13 Measures																												
Father Self-Efficacy	-.07	.06	-.03	.03	-.04	.04	-.05	.04	-.04	.04	-.04	.04	-.04	.04	-.05	.04												
Anger ^A																												
Father Irritability ^A	.21*	.05	.15*	.03	.19*	.04	.21*	.05	.18*	.04	.16*	.04	.22*	.05	.19*	.04	.25*	.06	.16*	.04	.16*	.04	.20*	.05				
Adolescent Internalizing ^A	.13*	.04	.11*	.03	.14*	.04	.14*	.04	.10*	.04	.12*	.04	.13*	.04	.12*	.04	.13*	.04	.12*	.04	.14*	.04	.14*	.04	.12*	.04		
Adolescent Externalizing ^A	.26*	.04	.27*	.04	.28*	.04	.28*	.04	.31*	.04	.25*	.04	.29*	.05	.25*	.04	.31*	.04	.31*	.05	.29*	.04	.29*	.04	.28*	.05		
Predicting Age 14 Father Harsh Parenting from Age 13 Measures																												
Father Self-Efficacy	.04	.04	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.04	.04	
Anger ^A																												
Father Irritability ^A	.14*	.04	.14*	.04	.13*	.03	.15*	.04	.14*	.04	.12*	.03	.13*	.03	.15*	.04	.17*	.04	.14*	.04	.14*	.04	.16*	.04	.16*	.04	.17*	.04
Age 13 Father Harsh Parenting ^A	.54*	.06	.62*	.05	.60*	.05	.55*	.04	.61*	.04	.58*	.04	.57*	.05	.63*	.05	.56*	.05	.49*	.05	.52*	.05	.49*	.05	.52*	.05	.63*	.06
Child Gender ^A	.11*	.04	.09*	.04	.09*	.03	.10*	.03	.09*	.03	.08*	.03	.08*	.03	.12*	.04	.10*	.03	.09*	.03	.12*	.04	.12*	.04	.11*	.03	.11*	.03
Predicting Age 15 Adolescent Internalizing Problems from Age 13 and 14 Measures																												
Adolescent Irritability ^A	.10*	.03	.14*	.03	.11*	.03	.12*	.03	.13*	.03	.18*	.04	.12*	.03	.11*	.03	.12*	.03	.14*	.03	.10*	.02	.10*	.02	.13*	.03	.13*	.03
Age 14 Father Harsh Parenting ^A	.01	.03	.01	.03	.01	.03	.01	.03	.01	.03	.01	.05	.01	.04	.01	.03	.01	.04	.01	.03	.00	.02	.01	.02	.01	.02	.01	.03
Father Self-Efficacy	-.01	.04	-.01	.02	-.01	.03	-.01	.03	-.01	.03	-.02	.05	-.01	.03	-.01	.03	-.01	.03	-.01	.03	-.01	.02	-.01	.02	-.01	.02	-.01	.04
Anger ^A																												
Father Irritability ^A	-.03	.03	-.03	.03	-.04	.04	-.04	.04	-.03	.03	-.04	.04	-.04	.04	-.03	.03	-.04	.05	-.03	.03	-.02	.02	-.02	.02	-.04	.04	-.04	.04

Paths	Cultural Group																							
	China	Colombia	Italy-Naples	Italy-Rome	Jordan	Kenya	Philippines	Sweden	Thailand	US-AA	US-EA	US-LA												
Adolescent Internalizing ^B	.38*	.11	.66*	.08	.69*	.05	.74*	.04	.42*	.07	.36*	.09	.62*	.06	.53*	.08	.45*	.06	.68*	.05	.53*	.08		
Child Gender ^B	.01	.09	-.43*	.15	-.14 [†]	.06	-.06	.06	-.08	.07	-.04	.08	-.02	.07	-.08	.09	-.10	.08	-.28*	.06	-.19*	.06	-.31*	.08
Total R ²	.18 [†]	.09	.68*	.13	.60*	.06	.62*	.06	.24*	.06	.20*	.07	.44*	.07	.34*	.09	.38*	.07	.37*	.06	.66*	.06	.43*	.08
Predicting Age 15 Adolescent Externalizing Problems from Age 13 and 14 Measures																								
Adolescent Irritability ^A	.13*	.03	.15*	.03	.15*	.03	.14*	.03	.12*	.02	.18*	.04	.14*	.03	.15*	.03	.12*	.03	.14*	.03	.13*	.03	.15*	.03
Age 14 Father Harsh Parenting ^A	.07 [†]	.03	.06 [†]	.02	.08 [†]	.03	.07 [†]	.03	.06 [†]	.02	.09 [†]	.04	.09 [†]	.04	.07 [†]	.03	.06 [†]	.03	.06 [†]	.03	.05 [†]	.02	.07*	.03
Father Self-Efficacy Anger ^A	.04	.04	.02	.02	.03	.03	.03	.03	.02	.02	.04	.04	.03	.03	.03	.03	.02	.02	.03	.03	.02	.02	.03	.03
Father Irritability ^A	.01	.03	.01	.02	.01	.03	.01	.03	.01	.02	.01	.03	.01	.03	.01	.03	.01	.03	.01	.03	.01	.02	.01	.03
Adolescent Externalizing ^B	.59*	.08	.66*	.05	.66*	.05	.73*	.04	.61*	.05	.42*	.08	.68*	.05	.62*	.06	.74*	.04	.65*	.04	.56*	.06	.66*	.06
Child Gender ^B	-.05	.03	-.03	.02	-.04	.03	-.04	.03	-.03	.02	-.05	.03	-.04	.03	-.05	.03	-.04	.02	-.03	.02	-.04	.02	-.04	.03
Total R ²	.47*	.11	.55*	.07	.58*	.06	.67*	.05	.46*	.06	.31*	.08	.60*	.06	.53*	.08	.67*	.05	.53*	.06	.41*	.07	.57*	.08

Note:

[†] *p* .05;

* *p* .01.

US-AA = US African American sample. US-EA = US European American sample. US-LA = US Latin American sample. Coefficients are standardized.

^AParameter was constrained to equality across cultural groups without significantly worsening model fit; slight variation in parameter estimates across cultural groups arises in the context of standardized coefficients.

^BParameter was not constrained to equality across cultural groups to improve model fit.