



Intergenerational Transmission of Emotion Dysregulation: The Role of Authoritarian Parenting Style and Family Chronic Stress

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Abstract

Objectives Although studies support a direct association between parent and child emotion regulation, little work has considered potential mechanisms, such as family context. For example, parents who have difficulty regulating their emotions may be more likely to adopt an authoritarian parenting style, especially under high family chronic stress, and this parenting style may then influence children’s development of emotion regulation. The current study examined authoritarian parenting style as a potential mechanism of the intergenerational transmission of emotion regulation. We also examined how maternal emotion regulation and family chronic stress interact to influence parenting behaviors.

Methods A total of 218 mother-adolescent dyads (*M* age = 15.5 years, 55% female) were recruited from the community and assessed using a mix of self-report measures of emotion dysregulation and parenting style, and interview-based measures of family chronic stress.

Results Results showed maternal emotion dysregulation predicted authoritarian parenting style that, in turn, predicted adolescent emotion dysregulation, with a significant indirect effect. Family chronic stress strengthened the association between maternal emotion dysregulation and authoritarian parenting style, such that the indirect effect of maternal emotion regulation on adolescent emotion regulation via authoritarian parenting style was stronger at high levels of chronic stress.

Conclusions Results suggest that authoritarian parenting style and family chronic stress serve as important factors in the intergenerational transmission of emotion regulation.

Keywords Emotion regulation · Intergenerational transmission · Authoritarian parenting style · Family chronic stress · Adolescents

Emotion regulation (ER) refers to the internal and external processes involved in initiating, maintaining, and modulating the occurrence, intensity, and expression of emotion (Thompson 1994). An essential component of development is learning to regulate emotional tone and dynamics and manage emotional responses in socially appropriate and adaptive ways (Eisenberg et al. 2002). Strategies employed to regulate emotion have important implications for individual’s interpersonal functioning, affective experience, and wellbeing (Gross and John 2003). Difficulties with ER have been increasingly linked to a wide range of outcomes,

including transdiagnostic psychopathology risk and increased physical illness (e.g., Aldao et al. 2010; Graziano et al. 2010; Yap et al. 2007). As such, understanding the development of ER capacities has broad implications for an individual’s psychosocial development.

There is evidence to support an association between parent and child ER, suggesting that ER is transmitted across generations. In a review, Bridgett et al. (2015) identified studies utilizing various methods across developmental periods to assess the intergenerational transmission of ER. Positive associations were reported between parental and infant vagal tone (Bornstein and Suess 2000), maternal and toddler effortful control (Bridgett et al. 2011), parental and preschooler reappraisal/response suppression (Gunzenhauser et al. 2014), and parental and adolescent emotion dysregulation (Buckholdt et al. 2014; Saritas and Gencoz 2012). These studies support the direct association between parent and child ER, but few have tested potential mechanisms through which transmission occurs. More work

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is needed to empirically examine the family context, specifically the role of authoritarian parenting style, as a mechanism of the intergenerational transmission of ER in adolescents.

Familial socialization of ER, defined as parents' implicit and explicit reactions to children's experience and expression of emotion, influences youth ER abilities. According to the tripartite model (Morris et al. 2007), a major process involved in familial socialization of ER is the emotional climate of the family, an important component of which is parenting style. Different parenting styles, characterized by variations in responsiveness and demandingness, are associated with discrete parenting practices that are differentially related to youth ER competencies (Baumrind 1968; Darling and Steinberg 1993). In particular, research has demonstrated links between *authoritarian* parenting (i.e., high levels of hostility, coercion, and psychological control, and low levels of warmth and acceptance) and children's poor observational and physiological self-regulatory behaviors. For example, maternal hostility and psychological control is associated with children's less adaptive ER, noncompliant behavior, and poor physiological regulation (e.g., Calkins et al. 1998; Morris et al. 2002). Parental minimizing and punitive responses to school-aged children's emotional displays also predict negative emotionality and avoidant coping in the child (Eisenberg et al. 1996). These studies support a model of ER development suggesting parenting characterized by punitive or hostile parenting practices, components of authoritarian style, may teach children to suppress (rather than understand and appropriately express) negative emotions, and deprive children of opportunities to learn and practice active, problem-focused ER skills in a supportive context (Grolnick et al. 1999; Sroufe 1996). Instead, children may feel little control over their environment and internalize messages that they are helpless and incompetent, thereby fostering passive, emotion-focused ER strategies (Nolen-Hoeksema 1998).

Importantly, almost all research (including the studies above) on the links between authoritarian parenting styles and ER focuses on childhood, such that limited information is available to support the assumption that parenting styles continue to impact the development of ER abilities in adolescence. To date, two studies suggest high levels of maternal rejection, a parenting practice associated with authoritarian style, are associated with low levels of ER in early adolescent (ages 10 to 11) males (Moilanen et al. 2010), and that harsh-conflicted parenting is linked to early adolescent (ages 11 to 13) difficulties with behavior regulation (Brody and Ge 2001). Moreover, Moilanen et al. (2014) found high levels of authoritarian parenting predicted rank-order decreases in adolescent (ages 11 to 16) ER abilities. These analyses also revealed high temporal

stability of parenting style and self-regulation over time, suggesting potential continuity of effects over the course of development. In contrast, authoritative parenting (i.e., high levels of responsiveness and demandingness, and high levels of warmth and acceptance) has been associated with youth self-regulation and use of adaptive ER strategies (Brody and Ge 2001; DeWall et al. 2007; Hardy et al. 1993).

Although numerous studies report direct associations between parental attitudes and behaviors and children's ER, few have explored potential explanations for authoritarian parenting behaviors that lead to child ER difficulties. Parental ER may be an important predictor of individual differences in parenting style. Negative emotional arousal is linked to negative parenting styles (Eisenberg et al. 1998; Gudmundson and Leerkes 2012). Parents experiencing overwhelming emotions without access to ER skills may utilize strategies that provide immediate escape from distress (i.e., speaking harshly or critically to a child) but are not responsiveness to children's needs (Dishion et al. 1991). For example, studies demonstrate associations between parent ER difficulties and increased use of negative discipline strategies, and decreased emotional availability (Kim et al. 2012; Kim et al. 2009). Poor executive functioning and effortful control, aspects of behavioral ER, are also linked to negative parenting behaviors (e.g., Bridgett et al. 2013; Deater-Deckard et al. 2012). Additionally, difficulties in parents' ability to cope with their own emotional arousal appears to influence attributional biases, as studies suggest parents who use harsh and inconsistent discipline often hold negative interpretations of their children's behavior (Jouriles and Thompson 1993; Weis and Lovejoy 2002), and that negative appraisal bias mediates the relation between mothers' experience of negative emotions and use of overreactive discipline (Lorber and O'Leary 2005). Research in families with depressed parents further suggests they experience deficits in ER that adversely influence parenting behaviors (Dix and Meunier 2009; Gross and Munoz 1995; Hops et al. 1987). Moreover, parents who use more reappraisal strategies exhibit less harsh and overreactive discipline, and are more likely to utilize praise as positive reinforcement for desirable behavior (Kohlhoff et al. 2016; Lorber 2012). Overall, difficulties in parent regulation skills hinder responsiveness to children's emotions and affect emotion socialization. As such, maternal emotion dysregulation could potentially predict higher levels of authoritarian parenting.

Given that it is likely both (a) predicted by parental ER and (b) predictive of offspring ER, authoritarian parenting style may serve as a mechanism of the intergenerational transmission of ER. Few studies have examined such mechanisms. Notably, Buckholdt et al. (2014) found that parental invalidation of emotion (i.e., punishment and neglect of emotions) mediated the relation between parent

and adolescent emotion dysregulation. Another study found parent and child effortful control (a temperamental characteristic contributing to ER) were associated through parenting practices (Valiente et al. 2007). Likewise Saritas and Gencoz (2012) suggested that maternal rejection, but not maternal warmth, mediated the intergenerational transmission of ER. These studies demonstrate preliminary support for associations investigated in the current study. However, no study has explicitly examined authoritarian parenting style, a distinct construct in the tripartite model (Morris et al. 2007), as a mechanism of the intergenerational transmission of ER.

In addition, another characteristic of the family environment, *family chronic stress*, may amplify the link between parental ER difficulties and authoritarian parenting behaviors. Family chronic stress is defined as persistent, enduring strains in relationships among family members, including (among other factors) higher levels of conflict, lower availability of family members for support due to competing demands, and lower relationship quality (Hammen and Brennan 2001). ER abilities may be especially important when chronic stress is high, as stress causes sustained emotional arousal that may require adaptive ER skills to cope. The stress and coping model (Lazarus 1993) identifies cognitive appraisals and coping strategies, two central components of ER, as interacting with stress to influence immediate and long-term outcomes (Tomaka et al. 1993). This model is supported by Deater-Deckard et al. (2016), who found that ER capacity and chronic stress interact to predict negative affectivity, such that women with more ER difficulties demonstrated the strongest associations between stress and negative affectivity. Extending these findings, not all parents with ER difficulties may be equally likely to utilize authoritarian parenting behaviors, as chronic stress may intensify or dampen associations between parental ER and parenting behaviors. For parents with ER difficulties, it is possible that stressful family environments may amplify parents' hostile appraisals of their children, heighten feelings of helplessness and distress, and decrease perceptions of control in the family system, so that this may lead them to utilize more authoritarian parenting behaviors.

Further, family stress may increase parents' cognitive load. High cognitive load has been shown to decrease the effectiveness of ER strategies, so that for parents with limited ER skills, the added demands of high family chronic stress may make it more difficult to manage emotions in parenting situations (Wegner et al. 1993). These processes may be stronger for women, who are most typically primary caregivers and more likely than men to experience uncontrollable stressors (i.e., discrimination), appraise events as threatening, experience distress in response to chronic stressors (especially those in the health and family

domains), and utilize emotion-focused coping (Folkman and Lazarus 1980; Matud 2004; Nolen-Hoeksema and Jackson 2001). This increased focus on negative emotions and experience of negative affect in the context of stressors may increase cognitive load and decrease effective employment of ER strategies (Folkman and Lazarus 1980; Ingram et al. 1998). Taken together, these factors may further impinge on mothers' regulatory capacities, thereby reducing maternal responsiveness and support in stressful family contexts. As such, mothers' emotion dysregulation may influence parenting behaviors more strongly in families with more chronic stress. Moreover, maternal functioning in stressful family contexts may be associated with youth adjustment, as Valiente et al. (2007) found parenting practices mediate the effects of family stress on children's effortful control and externalizing behaviors. As such, maternal ER and family chronic stress may interact to influence authoritarian parenting behaviors.

Adolescence may be a key developmental context during which the aforementioned processes are likely to occur. The majority of research on emotion socialization has focused on young children, and less work has investigated the role of parenting behaviors in adolescent ER. However, ER capacities and emotion-related processes are particularly important in adolescence given the numerous changes that accompany this developmental period. Changes in the dynamics of parent-child relationships, including increased autonomy seeking and conflict with parents, suggest adolescents require different parenting practices (i.e., less coaching and more acceptance and support) to manage their emotions independently (Yap et al. 2008). Moreover, adolescents tend to experience increased frequency and intensity of negative affect that may further tax parents' emotion-related skills (Flannery et al. 1993). Yap, Schwartz, Byrne, Simmons, and Allen (2010) report adolescents whose mothers display more negative affect and negative interaction behaviors display increased emotionally dysregulated behaviors and report more ER difficulties and depression. This demonstrates adolescent vulnerability to emotional dysregulation may be heightened due to their mothers' ER abilities and approach to emotion socialization. Because adolescence constitutes a time of increased risk for problems associated with poor regulation, and given changes in the dynamics of parent-child relationships, it is particularly appropriate to investigate authoritarian parenting style as a mechanism of the intergenerational transmission of ER during this period.

In the present study, we examine authoritarian parenting style as a mechanism of the intergenerational transmission of ER, and the role of family chronic stress as a risk factor for maladaptive parenting behaviors. We hypothesize that (a) maternal ER difficulties will be related to adolescent ER difficulties through authoritarian parenting style, and

regarding specific pathways, (i) maternal emotion dysregulation will predict higher levels of authoritarian parenting (the “*a*” path) and (ii) higher levels of authoritarian parenting will predict greater adolescent emotion dysregulation (the “*b*” path), (b) family chronic stress will intensify the association between maternal emotion dysregulation and authoritarian parenting style, and (c) the indirect effect of maternal emotion dysregulation on adolescent emotion dysregulation via authoritarian parenting style will be stronger at high levels of family chronic stress.

Method

Participants

The sample included adolescents aged 14–17 years ($N = 241$), recruited from the community, who participated with their primary caregiver. To obtain a sufficiently sized sample, we utilized multiple recruitment methods, including advertisements posted online and in the community (55.6%), a commercial mailing list (40.2%), and ResearchMatch, a national health volunteer registry (4.2%; for more recruitment details, see Starr et al. 2017). There were no differences across recruitment method on sex, age, or racial/ethnic group. However, adolescents recruited via advertisements were more likely to receive subsidized school lunch than those recruited through alternate methods ($\chi^2 = 10.50$, $p = 0.005$). Exclusion criteria included evidence of adolescent pervasive developmental disorder, prior diagnosis of bipolar or psychotic disorder, or any major physical or neurological disorder that impeded participation. Moreover, adolescents were excluded if they or their participating parents demonstrated English reading or language difficulties, or due to prior participation of another household member in the study. For most families (90.9%), the participating parent was a female caregiver (87.6% biological mother, 2.5% adoptive mother, 0.4% stepmother, 0.4% grandmother); the remaining families participated with a biological (8.7%) or adoptive (0.4%) father. All parents were legally able to provide permission for the adolescent to participate. Because mothers are typically more active emotion socializing agents and associated with the intergenerational transmission of emotion problems more than fathers, we restricted analyses to families in which a mother participated (Garside and Klimes-Dougan 2002; Tully et al. 2008). The final sample included 218 adolescents (M age = 15.5 years, $SD = 1.07$; 55% female) and their mothers (M age = 46.57, $SE = 6.10$). We also assessed non-binary gender identification, and three adolescents (1.4%) self-identified as gender fluid. Because gender was not a main focus of the study and included only as a covariate, these individuals were classified by

biological sex in analyses. Participants identified the following racial/ethnic backgrounds: 74.8% White, 13.3% Black, 3.2% Asian, 6.9% Multiracial, 1.4% other, and 0.4% Native American. In addition, 9.2% identified as Hispanic or Latino, and 24.8% of parents reported that their child received free or reduced-price lunch at school (an index of economic hardship).

Procedure

Informed consent/assent was obtained from all adolescents and parents included in the study, after which they were separately interviewed and completed a battery of questionnaires. Families were paid \$160 for participation in all study procedures and were entered into raffles. The University of Rochester Research Subjects Review Board approved study procedures.

Measures

Emotion regulation difficulties

Mothers and adolescents completed the Difficulties in Emotion Regulation Scale (DERS; Gratz and Roemer 2004), a 36-item self-report questionnaire that assesses multiple aspects of emotion dysregulation. It consists of a five-item Likert-type scale on which higher scores suggest greater problems with ER. The measure yields a total score assessing non-acceptance of emotional responses, difficulties engaging in goal directed behavior, impulse control difficulties, lack of emotional awareness, limited access to ER strategies, and lack of emotional clarity. Example items include, “I experience my emotions as overwhelming and out of control,” and “When I’m upset, I have difficulty thinking about anything else.” Strong psychometric properties of the DERS have been established in adult and adolescent populations, including high internal consistency ($\alpha = 0.93$), good test-retest reliability ($\rho_1 = 0.00$, $p < 0.01$), and adequate construct and predictive validity (Gratz and Roemer 2004; Weinberg and Klonsky 2009). Cronbach’s alpha was 0.94 for both parents and adolescents in the current study sample.

Authoritarian parenting style

The authoritarian scale of the Parenting Styles and Dimensions Questionnaire (PSDQ; Robinson et al. 2001) is a 12-item, parent-report questionnaire that measures how frequently a parent exhibits certain behaviors, including physical coercion, verbal hostility, and non-reasoning/punitive strategies, towards their child. Each item is rated along a five-point Likert-type scale, with higher scores indicating more frequent use of the described behavior.

Example items include, “I scold or criticize when our child’s behavior doesn’t meet our expectations” and “I punish by taking privileges away from our child with little if any explanations.” The PSDQ has demonstrated good psychometric properties including criterion validity and internal consistency (Robinson et al. 2001). Cronbach’s alpha was 0.83 in the current study sample.

Family chronic stress

The Chronic Stress Interview (CSI), a portion of the UCLA Life Stress Interview (Hammen et al. 1987), is a semi-structured interview adapted for use with adolescents (Hammen and Brennan 2001). The CSI evaluates and objectively codes the nature and quality of ongoing conditions in the prior six months of the adolescent’s life as a measure of chronic stress and adaptive functioning. We specifically used the family relations domain, which assesses frequency and nature of arguments, conflict resolution, closeness, communication, trust, availability, acceptance, and dependability in all family relationships, including parent-child, sibling, and marital relationships. The CSI isolates objective assessments of ongoing stressful circumstances from the adolescents’ subjective perceptions of stress, with interviewers rating chronic stress based on objective features of individual domains on a nine-point scale (1–5, including half-points), with behaviorally specific anchors for each full value. These anchors range from exceptional to very poor conditions in the family environment. Coding is explicitly based on objective level of chronic stress, rather than distress that occurs as a consequence; this method of interviewing and objective coding is designed to segregate stress exposure from stress response. The CSI has demonstrated good psychometric properties including stability (representing truly chronic, ongoing conditions) and convergent validity (not subjective and corresponds to independent measures of similar constructs) (Daley et al. 2000; Hammen et al. 2009). Second raters re-coded 20% of interviews for interrater reliability; intraclass correlation was 0.78.

Data Analysis

Analyses were performed with path analysis in Mplus Version 7.4 (Muthén and Muthén 1998–2012). Given presence of some non-normal variables, maximum likelihood robust estimator was used to compute parameter estimates for continuous outcomes with standard errors that are robust to non-normality. An application of the general linear model, path analysis allows for parsimonious examination of hypothesized pathways across multiple correlated variables. Using path analysis over standard regression procedures also allows for missing data estimation procedures.

Specifically, missing data for endogenous variables was estimated using full information maximum likelihood, consistent with best-practice recommendations (Enders 2010). All path models included manifest variables only, and four criteria were employed to evaluate model fit: the chi-square test (χ^2), comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). According to Kline (2015), a nonsignificant χ^2 statistic, CFI 0.90, with > 0.95 preferred, and RMSEA and SRMR < 0.05 are considered evidence of good model fit. As indirect effects do not always have a normal distribution, hypotheses related to indirect effects were tested using 95% asymmetric confidence intervals (CIs) (Tofighi and MacKinnon 2011). CIs that do not include the value zero indicate a significant indirect effect. To test moderation, we created a multiplicative interaction term of maternal emotion dysregulation and family chronic stress. Significant interactions were decomposed by conducting simple slope tests in Mplus at high ($M + 1 SD$) and low ($M - 1 SD$) levels of the moderator. Moderation of the indirect effect was examined using 95% asymmetric CIs at high and low levels of family chronic stress. Figure 1 provides a conceptual depiction of the model tested.

Results

Descriptive Statistics

Table 1 presents descriptive data and bivariate correlations among major study variables. As expected, there were significant positive correlations between maternal and adolescent emotion dysregulation, maternal emotion dysregulation and authoritarian parenting style, and authoritarian parenting style and adolescent emotion dysregulation. Moreover, family chronic stress was significantly positively correlated with maternal emotion dysregulation, adolescent emotion dysregulation, and authoritarian parenting style; the modest correlations

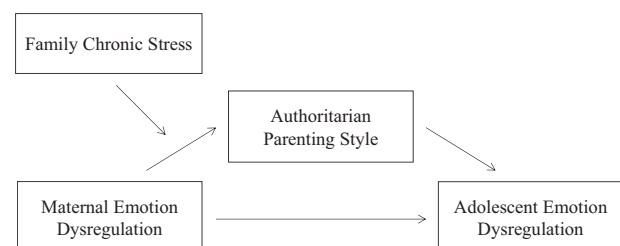


Fig. 1 Conceptual model in which authoritarian parenting style is a mechanism of intergenerational transmission of emotion regulation, with the indirect effect moderated by family chronic stress

Table 1 Pearson's product moment correlations, means, and standard deviations for study variables

	1	2	3	4	M	SD
1. Maternal emotion dysregulation					66.74	18.68
2. Authoritarian parenting	0.42***				1.51	0.42
3. Adolescent emotion dysregulation	0.15*	0.22**			86.25	25.07
4. Family chronic stress	0.18**	0.23**	0.33***		2.43	0.71
5. Adolescent sex	0.11	0.05	-0.09	-0.05		

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

between family chronic stress and authoritarian parenting style suggest they tap distinct constructs.

Authoritarian Parenting Style as a Mechanism of the Intergenerational Transmission of Emotion Dysregulation

Path analyses were conducted to examine whether authoritarian parenting style accounts for the intergenerational transmission of ER. Maternal emotion dysregulation was entered as an exogenous variable with authoritarian parenting style as the mediator and adolescent emotion dysregulation modeled as the endogenous variable. Adolescent sex was included as a covariate predicting the outcome variable. This model evidenced good model fit, $\chi^2(1) = 0.005$, $p = 0.94$, CFI = 1.0, RMSEA = 0.00, SRMR = 0.001; note that perfect CFI and RMSEA values are expected in cases where $\chi^2 < df$. With regard to specific parameters, maternal emotion dysregulation positively predicted authoritarian parenting style ($\beta = 0.42$, $p < 0.001$, 95% CI [0.30, 0.54]). Authoritarian parenting style, in turn, predicted increased adolescent emotional dysregulation ($\beta = 0.19$, $p = 0.019$, 95% CI [0.06, 0.32]). Finally, 95% asymmetric CIs indicated a significant indirect effect of maternal emotion dysregulation on adolescent emotion dysregulation via higher levels of authoritarian parenting (indirect effect = 0.11, $SE = 0.05$, $p = 0.024$; 95% CI [0.02, 0.22]). The association between maternal and adolescent ER was non-significant ($\beta = 0.08$, $p = 0.258$, 95% CI [-0.04, 0.21]) with inclusion of authoritarian parenting style. Figure 2 presents standardized parameter estimates for this model.

Family Chronic Stress as a Moderator of the Association Between Maternal ER and Authoritarian Parenting Style

To examine whether family chronic stress strengthens the association between maternal emotion dysregulation and authoritarian parenting style, we estimated a path model where authoritarian parenting style is predicted by the main effects of maternal emotion dysregulation and family chronic stress (both centered) and their interaction, with

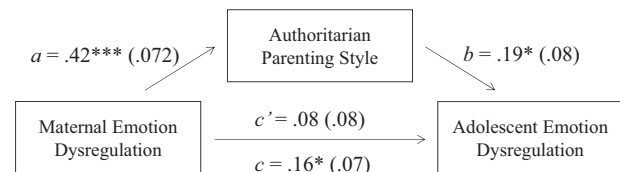


Fig. 2 Authoritarian parenting style as a mechanism of the intergenerational transmission of emotion regulation. Figure illustrates standardized parameter estimates (standard errors) for mediation pathway, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

adolescent sex included as a covariate. Full results are reported in Table 2. Notably, the interaction term was significant. Simple slope tests were conducted at high and low levels of family chronic stress. Although both simple slopes were significant, the association between maternal ER difficulties and authoritarian parenting was stronger at high chronic stress ($\beta = 0.53$, $p < 0.001$, 95% CI [0.40, 0.66]) than at low chronic stress ($\beta = 0.23$, $p = 0.017$, 95% CI [0.07, 0.38]). This interaction is illustrated in Fig. 3.

Authoritarian Parenting Style as a Mechanism of the Intergenerational Transmission of Emotion Dysregulation, Moderated by Family Chronic Stress

We next examined whether authoritarian parenting style differentially accounts for the intergenerational transmission of ER by level of chronic stress in the family. As predicted, the indirect effect of maternal ER on adolescent ER via authoritarian parenting style is stronger for families high in chronic stress (indirect effect = 0.13, $SE = 0.06$, 95% CI [0.02, 0.26]) than low in chronic stress (indirect effect = 0.06, $SE = 0.03$, 95% CI [0.003, 0.13]).

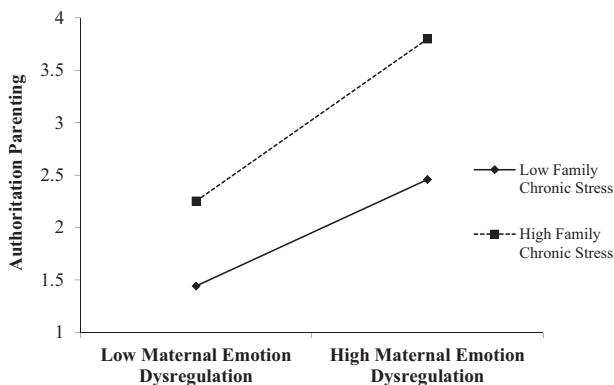
Additional Tests of Robustness

To ensure that the decision to restrict analyses to mother-adolescent dyads did not unduly influence results, analyses above were re-conducted using the full sample, including families with participating fathers ($n = 241$). All findings were retained. Finally, additional analyses were also

Table 2 Path analysis models testing moderating effect of family chronic stress on the association between maternal emotion dysregulation and authoritarian parenting behavior

Predictor	β	<i>b</i>	SE	<i>p</i>	95% C.I.*
Model $R^2 = 0.23$					
Intercept	-0.04	-0.02	0.08	0.836	-0.34, 0.27
Maternal ER	0.35	0.01	0.002	<0.001	0.24, 0.47
Family chronic stress	0.16	0.09	0.04	0.013	0.05, 0.26
Maternal ER \times Family chronic stress	0.18	0.01	0.002	0.005	0.07, 0.28
Adolescent gender	0.01	0.01	0.05	0.908	-0.09, 0.11

95% confidence intervals are presented for standardized model results

**Fig. 3** Graphical depiction of the interaction between maternal emotion dysregulation and family chronic stress, predicting authoritarian parenting behavior. High and low levels of each variable reflect one standard deviation above and below the mean

conducted with indicators of socioeconomic status such as parental education level, employment status, and household income included as covariates predicting the outcome variable. Again, all results were retained.

Discussion

The current study sought to examine aspects of the family environment that may serve as mechanisms of the intergenerational transmission of ER. Previous studies support associations between parent and child ER, but fewer have considered mechanisms of transmission. Findings provided support for authoritarian parenting style as a mechanism through which ER difficulties are passed from mother to adolescent. Further, family chronic stress strengthened the association between maternal emotion dysregulation and authoritarian parenting style, such that the indirect effect of maternal ER on adolescent ER via authoritarian parenting style was stronger at high stress levels.

As hypothesized, maternal ER difficulties were associated with greater authoritarian parenting style. Maternal emotion dysregulation may influence how mothers interpret children's behavior and affect their emotional availability, sensitivity, and discipline practices (Jouriles and Thompson 1993; Lorber and O'Leary 2005). We also found that higher levels of authoritarian parenting were associated with greater adolescent emotion dysregulation. This is consistent with research suggesting parental socialization practices, including hostile or coercive reactions to children's behaviors and emotional expression, influence children's understanding, experience, expression, and regulation of emotion (Eisenberg et al. 1998). Notably, when children's expression of negative emotion is punished or dismissed, they are socialized to suppress emotion and show increased physiological arousal, store more negative affect in their memory, and avoid or exhibit maladaptive responses to emotion-eliciting situations (Eisenberg et al. 1996; Gross and Levenson 1997).

Higher levels of authoritarian parenting accounted for the effects of maternal ER difficulties on adolescent ER difficulties; thus, parenting style may be an important mechanism of the intergenerational transmission of trait ER deficiencies. Mothers with limited emotional awareness or access to adaptive ER strategies may not be able to manage their own emotional responses in difficult parenting situations, or may become overwhelmed by their adolescent's intense and fluctuating emotions. These ER difficulties may hinder maternal responsiveness and support, and intensify hostility and control, parenting practices that may, in turn, heighten adolescents' emotional arousal and distress (i.e., induce anxiety about punishment, fear, or anger) and prevent their understanding of negative affect. This may influence adolescents' awareness and expression of emotions, and limit their access to adaptive ER strategies when managing stressors (Eisenberg et al. 1996).

Although this study supported the relationship between maternal emotion dysregulation and parenting style, the moderate magnitude of this association suggests possible heterogeneity in parenting behaviors among mothers with similar levels of ER difficulties. This study identified family chronic stress as a contextual factor that strengthened the association between maternal emotion dysregulation and authoritarian parenting style, such that authoritarian parenting style accounted for the relation between maternal and adolescent ER more strongly in families experiencing high levels of chronic stress. A stressful home environment may strain parents' regulatory capacities and impact parenting behaviors through mechanisms such as amplified negative affect and feelings of helplessness and distress, decreased perceptions of control in the family system, and disrupted cognitive capacities and regulation of attention. As such, levels of chronic stress in the home influence the extent to

which parents' ER abilities predict parenting style, which in turn contributes to adolescent emotion dysregulation (Muraven and Baumeister 2000). Notably, many studies on stressful home environments focus on chronic, high stress or acute events (i.e., maltreatment) that result in increased likelihood of maladaptive outcomes. This study is novel in its objective measurement of chronic stress across a larger continuum of severity (ranging from high-level family functioning to severely stressful family environments) in relation to ER and parenting style.

Regulation of emotional experience and expression has important implications for adolescents' ability to cope with stressors, and their vulnerability to psychopathology. Healthy ER skills are especially critical in adolescence, a developmental period rife with interpersonal and biological changes that markedly increase risk for psychological disorders characterized by affective dysregulation, including depression (Kessler et al. 2001). Lack of parental provision of appropriate regulatory support and structure, compounded by high levels of stress in the home, may lead to increased adolescent emotional dysregulation that heightens vulnerability to depression. Supporting this finding, Buckholdt et al. (2014) found that the link between parent invalidation of emotion and adolescent internalizing symptoms is partially explained by adolescent ER difficulties. Moreover, sensitive caregiving plays a critical role in other developmental periods, as parents' responsiveness to infants' emotions influence infants' ability to regulate internal states. For example, infants whose mothers misread or ignore their emotional cues display more signs of stress, less positive affect, and utilize maladaptive and self-oriented ER strategies (Gable and Isabella 1992; Kogan and Carter 1996). Given research suggesting the stability of maternal sensitivity and attachment security over time, early parental interactions may predict parenting style in adolescence and influence a child's long-term ability to express and regulate emotions (Bigelow et al. 2010; Contreras et al. 2000; Waters et al. 2000). Future longitudinal research should examine the continuity of these processes across developmental periods.

Limitations and Future Directions

In terms of study limitations, this study is cross-sectional in design, and thus we are unable to make causal inferences or verify temporal ordering of effects. This limitation is tempered by the strong theoretical basis for the direction of effects hypothesized (Eisenberg et al. 1996; Morris et al. 2002; Shrout 2011), as well as existing longitudinal studies that are consistent with findings from this cross-sectional work (Buckholdt et al. 2014; Saritas and Gencoz 2012; Valiente et al. 2007). While it is conceptually unlikely that parenting style predicts maternal ER, the association

between parenting style and adolescent ER is likely bidirectional, as parents are likely to modulate their parenting choices based on their child's emotional needs (Eisenberg et al. 1998; Morris et al. 2007). Thus, a model in which adolescent ER predicts parenting style could potentially account for results. Adolescent ER difficulties may also have an impact on parental ER capacity over time, and, subsequently, influence parenting behaviors. Finally, the cross-sectional design also precludes us from determining whether findings are unique to adolescence, or whether they reflect continuity in processes that emerge earlier in development. Utilizing longitudinal designs to examine temporal patterns would provide insight into causal and bidirectional relationships, and is a necessary next step. However, given the novelty of the mechanisms investigated, we believe our study represents an important first step to elucidating mechanisms of the intergenerational transmission of ER.

In addition to the cross-sectional design, other study limitations must be noted. First, we assessed self-reported ER abilities and authoritarian parenting behaviors rather than using interview or observationally based measures. Although widely used, these self-report measures are subject to limitations of social desirability and lack of awareness that may underestimate actual, less censored responses. This is especially relevant to maternal perceptions of their parenting, as explicit attitudes about their children and parenting behaviors are often subject to cognitive control and social distortion (Kendziora and O'Leary 1998). Moreover, adolescents often lack insight into their ER abilities and strategies that may bias reporting. Future studies should utilize alternative assessment approaches (e.g., implicit measures; Sturge-Apple et al. 2015) to more accurately evaluate underlying parental attitudes. Using observational parent-child interaction tasks and coding for dimensions of emotional responses may help us to gain insight into parent and child ER strategies and parental socialization of emotion. Additionally, the operationalization of chronic stress is based on interviews conducted with the adolescents, and it is feasible that adolescent ER could influence how they describe chronic stressors to interviewers. However, the measurement of chronic stress via coded interviews based on objective features of stressful circumstances, rather than adolescents' subjective perceptions of stress, is designed to minimize this potential confound. Finally, due to a limited number of fathers in the sample, this study was unable to explore parent gender as a moderator of effects. However, compared to mothers, fathers report less involvement in parenting and more punitive, less sensitive reactions to children's emotions (Eisenberg et al. 1996; Zeman and Shipman 1996). As such, future studies should examine if paternal ER differentially impacts child ER, or does so via different pathways. Study limitations are balanced by several strengths, including the

use of both moderation and mediation analyses to elaborate on the processes through which the family context affects the intergenerational transmission of emotion dysregulation. The use of multi-informant (e.g., adolescent-report, parent-report) and multi-method (e.g., interview, questionnaire) data reduces possible shared method variance. Moreover, this study expands on existing literature by examining the adolescent period, a critical time wherein interpersonal and biological changes heighten vulnerability to emotion dysregulation and psychopathology.

An important next step is to clarify additional mechanisms through which the intergenerational transmission of ER operates. In addition to authoritarian parenting style, the tripartite model (Morris et al. 2007) suggests that familial socialization of ER can occur via observations of how family members handle emotions, socialization of emotion understanding and emotion-coaching, parent-child attachment, and family expressivity. Research also indicates that high levels of interparental conflict may spillover into the parent-child relationship, thereby disrupting children's emotional security and influencing ER abilities (Schoppe-Sullivan et al. 2007). As such, marital stress might influence both parenting behaviors and youth ER, and future work should clarify the interplay between these constructs. In addition to investigating other mechanisms of transmission, it is important to continue to examine biomarkers of ER implicated in stress physiology (i.e., heart rate, respiratory sinus arrhythmia, hypothalamic-pituitary-adrenal axis regulation), as well as genetic influences on heritability, gene-environment interplay, and epigenetic processes, that may help to explain the link between parent and child ER (for a review, see Bridgett et al. 2015; Joosen et al. 2013; Moore et al. 2009). Future work should also consider the role of parent and adolescent temperament, and how differences in dispositional emotionality might interact with family processes and ER abilities (Morris et al. 2007; Yap et al. 2007). Finally, more research should further elucidate the role of parental ER, authoritarian parenting style, and stressful family contexts on youth ER, with the ultimate goal of identifying potential targets for intervention that may help to prevent the transmission of ER difficulties.

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Compliance with Ethical Standards

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

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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