

What Counts in Externalizing Behaviors? The Contributions of Emotion and Behavior Regulation

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The aim of this study was to examine the distinct roles of emotion and behavior regulation in externalizing behavior problems of elementary school children. Parents and teachers of 104 seven-year-old children living in Istanbul were given the Emotion Regulation Checklist and the Children's Behavior Questionnaire. The Eyberg Child Behavior Inventory was used to measure children's externalizing behaviors. Results revealed that emotion and behavior regulation are modestly related to each other, and in general, both abilities are linked to externalizing behaviors. Low emotion and low behavior regulation significantly predict externalizing behaviors. Interaction between the two regulatory abilities predicts externalizing behaviors. Emotion and behavior regulation appear to be separate dimensions operating together in relation to children's behavior problems.

Childhood externalizing behaviors involving disobedient, destructive and aggressive acts have been associated with peer rejection, poor academic performance, increased risk for school drop-out and problems (for example, delinquent behaviors) in adolescence and adulthood (Bradley, 2000; Fergusson, Horwood, & Ridder, 2005; Reid, Gonzales, Nordness, Trout, & Epstein, 2004). This suggests that prevention of externalizing behaviors is of special importance, and requires an understanding of the processes in social and emotional development in early years. Among all abilities, emotion regulation and behavior regulation appear to be the basic regulatory mechanisms which underlie social behaviors, and hence, are linked closely to externalizing behaviors.

Previous findings consistently indicate that emotion regulation (Zahn-Waxler, Cole, Fox, Usher, & Welsh, 1996) and behavior regulation are negatively related to externalizing behaviors (Eisenberg, Cumberland et al., 2001). However, these studies have mostly investigated emotion regulation (Rydell, Berlin, & Bohlin, 2003) and behavior regulation (Lengua, 2003) separately in relation to externalizing behavior problems. Moreover, the conceptual distinction between emotion regulation and behavior regulation is rarely accentuated, in some cases causing contamination between the two measures. For instance, attentional regulation, which is an aspect of behavior regulation, has sometimes been suggested to be a mechanism primarily employed for managing internal emotion-related states, and used interchangeably with emotion regulation (Eisenberg, Guthrie et al., 2000).

Due to the imperative role of emotion regulation and behavior regulation in social behaviors of children, it is necessary to distinguish between these two regulatory abilities, both at the conceptual and measurement levels, and to examine them simultaneously in order to clarify their unique contributions as well as their combined and interactional effects on social behavior. The purpose of this study was to investigate the relations between emotion regulation, behavior regulation, and externalizing problems using unadulterated measures of emotion regulation and behavior regulation.

A brief review of the extant literature helps to understand the conceptual distinction between emotion regulation and behavior regulation. To begin with emotion regulation, researchers (for example, Eisenberg and Fabes, 2000; Zahn-Waxler et al., 1996) define emotion regulation in different ways. Much of the diversity in these definitions stems from the basic question of what emotion regulation consists of; whether emotion regulation involves only the *inhibition* of emotional reactions, or whether it also includes the *maintenance* or *enhancement* of these reactions. Another question concerns whether emotion regulation can be regarded solely as self-management or whether we can consider one's assent to other's management of emotions as emotion regulation.

Thompson (1994) defines emotion regulation as "the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goal" (pp. 27–28). In this definition, both maintenance and enhancement aspects of emotion regulation and the inhibition of emotional arousal are emphasized. Accordingly, depending on the context, negative emotions such as anger may sometimes need to be maintained or enhanced rather than inhibited. For example, children who need to stand against the class bully would probably need to intensify their anger in order to cope with the situation (Thompson, 1994).

A last point regarding the definition of emotion regulation concerns the type of emotion that is regulated. Although much focus is given to the regulation of negative emotions, emotion regulation should involve the modulation of both positive and negative emotions (Bridges, Denham, & Ganiban, 2004). In the present study, Thompson's (1994) definition of emotion regulation is adopted, and emotion regulation is conceptualized as a constellation of skills related to both self-management and enhancement of emotions, and inhibition of emotional arousal as appropriate.

Difficulties in regulating emotions have been proposed to be a central feature of children's externalizing behaviors (Bradley, 2000). This relation has received support from a large number of studies (for example, Zahn-Waxler, Cole, & Smith, 1994). Zahn-Waxler et al. (1996) examined the relations between expressivity of emotion regulation (highly expressive, modulated, and inexpressive children) and externalizing behaviors. They showed that children with optimal levels of emotion regulation were able to modulate displays of negative affect, and that both overregulation and underregulation reflected atypicality in emotion regulation.

Shields, Cicchetti, and Ryan (1994) found that maltreatment had an adverse influence on children's emotion regulatory abilities which further predicted aggression and disruptive behaviors. Similarly, Eisenberg, Losoya et al. (2001) revealed that children

whose parents expressed negative affect frequently and were not warm displayed underregulation of emotion, and were in turn more prone to show externalizing behaviors than children whose parents were warm and expressed positive emotions frequently. These findings suggest that emotion regulation has a central place in adaptive social development and difficulties in this skill play an important role in children's externalizing behavior problems.

The other regulatory mechanism, behavior regulation, is defined in terms of attentional processes (for example, attention shifting, attention focusing), inhibitory control and impulsivity (Posner & Rothbart, 2000), and suggested to have a strong temperamental basis. For instance, in their definition of temperament as relatively stable and physiologically based individual differences in reactivity and self-regulation, Rothbart et al. (1994) emphasize aspects of behavioral regulation (Rothbart, Ahadi, and Hershey, 1994). Attentional, inhibitory and activational control systems involved in behavior regulation enable the suppression of an inappropriate response or maintenance of a desired response (Posner and Rothbart, 2000). A brief description of these processes indicates how each is linked to behavior regulation. Attentional processes of focusing (that is, the ability to maintain attention upon task-related channels) (Rothbart, Ahadi, Hershey, and Fisher, 2001) and shifting have an important part in managing emotion-related physiology and behaviors (Eisenberg, Fabes et al., 2000). Inhibitory control involves the ability to plan and suppress inappropriate responses (Rothbart et al., 2001) and is thought to be fundamental for active inhibition of antisocial behaviors and also for enactment of prosocial behaviors (Lengua, 2003). The other process, impulsivity, refers to the speed of response initiation as well as the ability to wait for a desired goal or object (Rothbart et al., 2001) and is shown to predict externalizing behaviors in children (Lengua, 2003).

It has well been documented that behavior regulation plays an important part in externalizing behaviors (Eisenberg, Cumberland et al., 2001). Children with externalizing problems were found to be low on attentional and inhibitory control, and higher on impulsivity, and both inhibitory control and attention regulation were found to be related to lower levels of externalizing behaviors (Eisenberg, Guthrie et al., 2000; Lengua, 2003). Poor behavior regulation in early childhood was also found to predict externalizing behaviors in middle childhood (Bowen, 2005).

When described on its own merits, each regulatory ability appears as clear, distinct skills. However, distinguishing between what constitutes emotion regulation and behavior regulation is not an easy task. Eisenberg, Fabes et al. (2000) differentiated between emotion regulation and emotion-related behavior regulation, and defined emotion regulation as the process of initiating, maintaining, modulating, or changing the occurrence, intensity, or duration of *internal* feeling states and emotion-related *physiological* processes. They suggested that attention focusing and shifting are necessary for attainment of emotion regulation. On the other hand, they described emotion-related behavior regulation as the process of initiating, maintaining, modulating, or changing the occurrence, form and duration of *behavioral* aspects of emotion. They referred to this type of regulation as behavioral regulation and stated that it involves

inhibition or activation of behavior that is linked to emotion. According to this account, the *locus* of regulation is key to the distinction between the two capacities. While the locus of emotion regulation is the internal psychological reaction, it is the overt act associated with aroused internal states in behavior regulation. As evident in this description, emotion regulation and behavior regulation are different and related, since they are both linked to inner processes in varying levels. For instance, behavioral inhibition can be used to prevent approach towards a distressing situation which influences internal *experience* of emotions, and hence, can be considered as a strategy for regulating emotions (Eisenberg, Fabes et al., 2000).

Since some aspects of behavior regulation also have a role in the regulation of emotions, some researchers (Eisenberg, Fabes et al., 2000) take them as indicators of both behavior regulation and emotion regulation, which raises the issue of contamination between measures. Among all, attentional control is studied the most in relation to emotion regulation. For instance, emotion regulation has sometimes been defined in terms of attention focusing and shifting, and these terms were used synonymously (Eisenberg et al., 1997). This basically stems from the thought that attention regulation (for example, shifting attention from an emotionally arousing situation) helps one to control affect. In this way, emotion regulation encompasses aspects of behavior regulation. Rothbart and Rueda (2005) also indicated that attention can be directed internally to coordinate thoughts and emotions. However, it might be argued that attention regulation chiefly reflects regulation of behaviors which do not involve major emotional processes (for example, easily shifting from one activity to another one), and an examination of the scale items which measure attention regulation reveals that the processes tapped are more closely related to the behavioral aspects of regulation than the emotional ones (for example, "When watching T.V., is easily distracted by other noises or movements" in the Children's Behavior Questionnaire developed by Rothbart, 1994).

The problem of overlap between the two regulatory abilities also results from the fact that emotion regulation is mostly assessed via overt, *observable* attributes instead of physiological measures (for example, heart rate or vagal tone), which is mainly due to the difficulties associated with using these techniques (Zahn-Waxler et al., 1996). Nonetheless, emotion regulation and behavior regulation are related and distinct processes, and children who have difficulty controlling their feelings of anger, can well handle the acts associated with this affect, and may not display aggressive behaviors.

All these claims point to the importance of investigating the relations between emotion regulation and behavior regulation empirically. There are, so far, few studies which have examined the linkage between the two basic mechanisms of regulation. Kalpidou, Power, Cherry, and Gottfried (2004) found a positive link between emotion regulation and inhibitory control—that is, preschoolers who were able to maintain a positive emotional state were more likely to comply with adult instructions, and children who displayed their emotions through anger outbursts had more difficulty with acquiescence. Kochanska et al. (2000) further demonstrated that children who showed anger and joy more slowly and in lower intensity were also better at regulating their

behaviors (for example, inhibitory and attentional control). Although limited in number, these studies revealed a positive relationship between emotion regulation and some aspects of behavior regulation (for example, inhibitory control).

There are also a small number of studies that have examined children's behavior problems by focusing on emotion regulation and behavior regulation at once. The studies that focus on emotion regulation and behavior regulation have either combined these two regulatory abilities (for example, Rubin, Burgess, Dwyer, & Hastings, 2003) or explored the influences of behavior regulation together with emotionality, which can be considered an aspect of emotion regulation. Emotionality is principally the reactive component of emotion and describes frequency and intensity of emotional reactions (Rydell et al., 2003). It has been suggested that emotionality and emotion regulation are related processes and should be treated as separate phenomena. This is due to the fact that emotion regulation is not only limited to the regulation of intense emotions, but also includes maintenance and enhancement of emotions. Nevertheless, studies that examine behavior regulation together with emotionality can be informative, since emotionality captures some aspects of emotion regulation.

One such study conducted by Eisenberg, Guthrie et al. (2000) revealed that behavior dysregulation predicted externalizing behaviors in elementary school both for children who were high and low on negative emotionality. This finding suggests that children who do not experience intense emotions may still engage in externalizing problems if they have poor behavior regulation. In another study, Eisenberg, Cumberland et al. (2001) showed that negative emotionality and behavior regulation had additive effects on children's behavior problems, each explaining unique variance in the outcome behavior. For instance, children who displayed both angry affect and difficulties in behavior regulation were more prone to develop externalizing problems, compared to children who displayed only difficulties in behavior regulation.

More recently, Rubin et al. (2003) examined behavior regulation and emotion regulation simultaneously in relation to externalizing behaviors by combining the two regulatory skills into a single measure. Results of this study revealed that the relation between conflict-aggressive initiations (for example, grabbing or pushing peers while trying to acquire an object) and externalizing behaviors was strongest for toddlers who had low levels of emotional and behavioral dysregulation. While it is evident in this finding that emotion regulation and behavior regulation are strong predictors of children's externalizing behaviors, their unique and interactional effects are not convincing.

This review puts forward findings pertinent to the simultaneous influences of emotion regulation and behavior regulation are limited, not permitting conclusions about independent contributions of these two regulatory abilities to children's externalizing behaviors. Distinction between the two regulatory abilities is also imprecise, obscuring the evaluation of extant findings. Accordingly, the major goal of the present study was to distinguish between emotion regulation and behavior regulation both at the conceptual and measurement levels, and to examine the relations between the two regulatory abilities as well as revealing their individual and combined influences on children's externalizing behaviors.

An extensive literature review further revealed that few studies have examined externalizing behaviors in Turkish children. There are no studies conducted in Turkey which have investigated children's emotion regulation and behavior regulation. Another aim of the present study was to examine levels of emotion regulation, behavior regulation and externalizing behaviors in Turkish children which might contribute to our knowledge of these children's social and emotional development during their elementary school years.

Based on previous findings, it was predicted that emotion regulation and behavior regulation would be positively related, and the two abilities would be negatively linked to externalizing behaviors: children who displayed more externalizing behaviors were expected to score lower on emotion regulation and behavior regulation than children who displayed lower levels of externalizing behaviors. In terms of sex differences, previous findings indicated that girls are better at regulating their emotions (Zahn-Waxler et al., 1994) and behaviors (Eisenberg, Cumberland et al., 2001) and they engage in less externalizing behavior than boys (Eisenberg, Gershoff et al., 2001; Ulu and Fisiloglu, 2002). Hence, in the present study it was predicted that girls would score higher on emotion regulation and behavior regulation, and lower on externalizing behaviors than boys.

To our knowledge, independent and combined influences of emotion regulation and behavior regulation on children's externalizing behaviors have not been explicitly examined in children coming from a Turkish background or other backgrounds. Rather, the studies that have simultaneously considered the two regulatory abilities in relation to externalizing behaviors have either combined the two regulatory abilities into a single measure (Rubin et al., 2003) or have not examined interactions between emotion regulation and behavior regulation (Eisenberg, Cumberland et al., 2001). In the present study, the additive and multiplicative influences of emotion regulation and behavior regulation were explored to see whether each ability individually predicts externalizing behaviors, and whether their interaction contributes to the prediction of externalizing behavior problems after individual variables were already accounted for.

METHOD

Participants

Participants in this study consisted of children who were in the second grade of three public and seven private schools located in the higher socioeconomic suburbs of Istanbul, Turkey. Children's parents and teachers participated in the study by completing questionnaires. The total sample included data from one hundred and five children. Among these one hundred and five children, one was identified as having a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD). Since the goal of the present study was to examine regulation and externalizing behaviors in a non-clinical sample of children, this child was excluded from the sample. The final sample included one hundred and four children whose age ranged from eighty-three to ninety-seven months with an average of 89.47 months ($SD = 3.48$). There were forty boys ($M = 89.63$

months, $SD = 3.45$) and sixty-one girls ($M = 89.54$ months, $SD = 3.44$). Sex information was not provided for three children.

The majority of the mothers and fathers had completed high school and university, respectively. There were six categories for household income where the highest category represented a very high income in Turkey. Socioeconomic status (SES) was composed from mothers' and fathers' education levels and occupation ratings, and household income. Z-scores were computed for these five variables and their average was calculated to obtain a total SES score. The mean SES for the sample was 0.07 ($SD = .79$) with a range of -1.92 to 1.21 .

Procedure

Turkish versions of the scales were formed through a careful translation and back-translation procedure. Semantic corrections were made to ensure that the items in Turkish tapped the very same behaviors as the original items.

In the first phase of data collection, directors of elementary schools were contacted and parent letters describing the purpose of the study were sent to mothers through the child's school. Mothers who agreed to participate in the study were sent the background information form and scales measuring emotion regulation, behavior regulation, and externalizing behavior problems, again via the child's school. Mothers were asked to return the completed questionnaires in the envelope enclosed. Teachers completed the same scales for children whose mothers had given consent to participate in the study.

Measures

Parent and teacher questionnaires were used for the assessment of predictor and outcome variables. The same questionnaires were administered to both parents and teachers in order to obtain information about children (that is, regulatory abilities and externalizing behaviors) in the home as well as in the school context.

Background Information Form. Parents were asked to complete a background information form where they provided information about the child (age, sex, presence of any developmental disorder), parents (age, occupation, education level), and household income.

Emotion Regulation. The Emotion Regulation Checklist (ERC) developed by Shields and Cicchetti (1997) was used to measure children's emotion regulation ability. The ERC is a twenty-four-item questionnaire with both parent and teacher forms. A factor analysis conducted by Shields and Cicchetti (1997) revealed two subscales labeled Lability-Negativity and Emotion Regulation. The Lability-Negativity subscale consisted of items tapping lack of flexibility, mood lability and anger dysregulation, such as "Exhibits wide mood swings"; and the Emotion Regulation subscale consisted of

items representing adaptive regulation including situationally appropriate positive and negative emotional displays and empathy, such as “Can say when she/he is feeling sad, angry or mad, fearful or afraid” and “Is empathic toward others.” Each item on the ERC is rated on a four-point Likert scale (One = “never,” four = “always”).

In the present study, responses of raters were subjected to detailed screening in the process of forming variables. One item in the parent form of the ERC, (“Takes pleasure in the distress of others (for example, laughs when another person gets hurt or punished; seems to enjoy teasing others”) was omitted due to low range.

The issue of overlap between concepts of emotion regulation and behavior regulation was discussed above. In addition to conceptual overlap, an overlap was observed at the measurement level. Due to the close link between emotion regulation and behavior regulation, creating reliable measures for each variable that excluded seemingly overlapping processes was a challenge for researchers, and not always achieved. In order to examine similarities in the skills and behaviors tapped in the scales, inter-item correlations were computed for measures of emotion regulation, behavior regulation and externalizing behaviors. Overall, associations among all scale items were low. Correlations between items of the ERC and the Children’s Behavior Questionnaire (used to measure behavior regulation) ranged between .01 and .42 ($p < .05$), indicating at best a moderate association.

A careful examination of the items in these scales, however, revealed there were some conceptually overlapping items. For example, “Is impulsive” is not an aspect of emotion regulation, as defined in the present study. This item measured the impulsivity aspect of behavior regulation. Thus, it was excluded from the parent and teacher forms of the ERC. On the other hand, a different item on the ERC, “Is prone to angry outbursts/tantrums easily” was included in the Eyberg Child Behavior Inventory (“Has temper tantrums”). It was used to measure externalizing behaviors in the present study. The correlation between those two items also showed they were strongly associated ($r = .67, p < .01$), and, therefore, the item was excluded from the ERC. Final versions of parent and teacher forms of the ERC were composed of twenty-one and twenty-two items, respectively.

In this study, emotion regulation was conceptualized as the capacity to modulate one’s emotional arousal, whether the emotion was a negative one such as anger, or a positive emotion such as excitement. This conceptualization implied that emotion regulation is a general construct involving mood lability, anger regulation, as well as the ability to display situationally-appropriate positive emotions. It necessitates examining emotion regulation as a unitary construct rather than investigating its aspects separately. Accordingly, a total score of emotion regulation¹ was computed for parent and teacher forms of the ERC, which displayed high internal consistencies with alpha coefficients of .73 and .75, respectively.

Behavior Regulation. The Children’s Behavior Questionnaire (CBQ) developed by Rothbart et al. (1994) was used to measure behavior regulation. The CBQ is composed of fifteen scales and one hundred and ninety-five items rated on a seven-point Likert

scale (One = "extremely untrue," seven = "extremely true"). These scales tap two broad dimensions of regulation—reactivity and self-regulation. An initial examination revealed that four of the fifteen scales in the CBQ are closely linked to behavior regulation: Attention Focusing (fourteen items), Attention Shifting (twelve items), Impulsivity (thirteen items), and Inhibitory Control (thirteen items). The Attention Focusing scale assesses a child's tendency to maintain attentional focus upon task-related issues (for example, "When practicing an activity, has a hard time keeping her/his mind on it"); the Attention Shifting scale measures a child's tendency to shift attention between tasks (for example, "Is hard to get his/her attention when s/he is concentrating on something"); the Impulsivity scale measures speed of response initiation (for example, "Usually rushes into an activity without thinking about it"); and the Inhibitory Control scale assesses the capacity to plan and suppress inappropriate responses under instructions or in novel situations (for example, "Has a hard time following instructions").

In the present study, these four scales were used to assess children's behavior regulation and items were rated on a five-point Likert scale (One = "always untrue," two = "always true") rather than a seven-point scale as in the original version of the CBQ. This reduction in points of the rating scale was made with the thought that a five-point scale would be more practical than, and as informative as, a seven-point one.

Although the CBQ was originally developed as a parental measure, some researchers (for example, Eisenberg, Cumberland et al., 2001) have also used it with teachers by making slight adaptations in item wordings (for example, "this child" instead of "my child"). In the present study, the item which is "Has an easy time leaving a play to come to dinner" was dropped from the teacher form, since teachers were unlikely to know this information. In addition, few adaptations were made in the teacher form of the CBQ (for example, "Is distracted from her/his projects when you approach" instead of "Is distracted from her/his projects when you enter the room") to make the assessed behavior more relevant for the classroom context.

All items in the four scales were also checked for their overlap with the measures of emotion regulation and externalizing behaviors. An item ("Is able to resist laughing or smiling when it isn't appropriate") in the Inhibitory Control scale was excluded from both parent and teacher forms of the CBQ as it tapped the appropriate display of emotional arousal, which is considered as an aspect of emotion regulation in the present study. In order to examine the overlap between items used to assess behavior regulation and externalizing behaviors, inter-item correlations were computed for CBQ and ECBI. The highest correlation found was $r = .49$, $p < .05$. Statistical examinations revealed no indications of multicollinearity, and in accordance, none of the items were dropped from the CBQ with a concern of overlap.

Rothbart et al. (2001) reported that CBQ is a theory-derived instrument and unlike factor-derived scales, the larger constructs are composed of relatively homogeneous components. Accordingly, the four scales of Attention Focusing, Attention Shifting, Impulsivity, and Inhibitory Control were regarded as homogeneous components of the

larger construct of behavior regulation. In this regard, total scores of behavior regulation for parent and teacher-ratings were computed from fifty-one and fifty items, respectively. The final forms of the parent scale had high internal consistency, with a Cronbach's alpha of .83. The teacher scale had a Cronbach's alpha of .90.

Externalizing Behaviors. The Eyberg Child Behavior Inventory (ECBI; Eyberg and Robinson, 1983) was used to assess children's externalizing behaviors. The ECBI is a thirty-six-item parent report measure of conduct problems involving three subscales: Conduct Symptoms (for example, "Steals"), Oppositional Defiant Symptoms (for example, "Does not obey house rules on own"), and Attention Deficit Hyperactive Symptoms (for example, "Is easily distracted"). The same questionnaire can also be administered to the teacher with appropriate changes in the wording of items (for example, "Hits parents" was replaced with "Hits teachers"). The scale items are rated twice, first, to indicate the intensity of behavior on a seven-point Likert scale (One = "never," seven = "always") and then to report whether it was perceived as a problem through "yes or no" questions. Accordingly, the child has an "Intensity Scale" score and a "Problem Scale" score for externalizing problems. In the present study, items were rated on a five-point Likert scale (One = "never," two = "always") rather than a seven-point one, in order to make the scale more user-friendly. Since the authors of the present study are particularly interested in investigating *levels* of externalizing behaviors instead of whether externalizing behaviors constitutes a problem for the parent or teacher, the Problem Scale score for the ECBI was not used, and the Intensity score was taken as the indicator of externalizing behaviors.

One of the items in the ECBI ("Wets the bed") was reported by the authors (Eyberg and Robinson, 1983) as a non-scale item (item distinct from behaviors tapped by the three subscales), and was omitted from both parent and teacher forms in the present study. In addition, one item ("Steals") was excluded from both of the forms due to its low range. A careful examination of the items in the ECBI revealed that two items ("Whines" and "Cries easily") tapped deficiencies in regulating emotions (that is, not being able to modulate sadness) rather than reflecting externalizing behaviors in elementary school children; and hence, were excluded from the parent and teacher forms of the ECBI.

Slight adaptations were made on the teacher form of the ECBI in order (for example, "Does not obey classroom rules on own" instead of "Does not obey house rules on own") to make the measure more appropriate for the school context. In addition, two items that were not relevant for teachers were omitted. The final form of the parent and teacher versions of the ECBI included thirty-two and thirty items, respectively.

The original normative studies (Eyberg and Robinson, 1983; Robinson et al., 1980) describe the ECBI as a unidimensional measure of conduct problems, and have used the mean-weighted intensity scores to represent levels of externalizing behaviors (Benzies, Harrison, and Magill-Evans, 2004; Robinson et al., 1980). For consistency, the present study investigated externalizing behaviors as a general dimension, all scales

TABLE 1
Mean, Standard Deviation, and Range for Questionnaire Data ($N = 104$)

	<i>M</i>	<i>SD</i>	Minimum	Maximum
Parent-rated measures				
Emotion regulation (1 = low, 4 = high)	3.11	.25	2.48	3.71
Behavior regulation (1 = low, 5 = high)	3.39	.30	2.73	4.00
Externalizing behaviors (1 = low, 5 = high)	2.23	.44	1.22	3.19
Teacher-rated measures				
Emotion regulation (1 = low, 4 = high)	3.00	.35	2.05	3.73
Behavior regulation (1 = low, 5 = high)	3.36	.46	2.34	4.28
Externalizing behaviors (1 = low, 5 = high)	1.76	.66	1.00	4.40

Note. Emotion regulation: the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions. Behavior regulation: attentional, inhibitory and activational control systems which enable the suppression of an inappropriate response to maintenance of a desired response. Externalizing behaviors: disobedient, destructive and aggressive behaviors.

in the ECBI were included in the measure, and a single score was computed from all the items. Both the parent ($\alpha = .91$) and teacher forms ($\alpha = .95$) of the ECBI displayed high internal consistency.

RESULTS

Descriptive statistics revealed that ratings of mothers and teachers were very similar for predicting and outcome variables (see Table 1). They both rated their children as displaying low levels of externalizing behaviors, and comparably high levels of emotion regulation and behavior regulation.

Sex Differences

MANOVA was computed to analyze sex differences in the two regulatory abilities and externalizing behaviors. Results showed that girls and boys were similar in terms of their regulatory abilities and externalizing behaviors on the whole (*Pillai's T* = .07,

$F(6, 74) = .94, \chi^2 = .07, ns$), and separately for parent-rated emotion regulation ($F(1, 79) = .69, ns$), behavior regulation ($F(1, 79) = 1.97, ns$), and externalizing behaviors ($F(1, 79) = 3.91, ns$). There were also no significant sex differences for individual measures of teacher-rated emotion regulation ($F(1, 79) = .13, ns$), behavior regulation ($F(1, 79) = .01, ns$), and externalizing behaviors ($F(1, 79) = .98, ns$).

Association between Regulatory Abilities and Externalizing Behaviors

SES was not significantly associated with emotion regulation, behavior regulation and externalizing behaviors as rated by parents (see Table 2 for the zero-order correlations). On the other hand, teacher ratings indicated that externalizing behaviors were slightly higher in children coming from a lower SES.

Emotion regulation, behavior regulation, and externalizing behaviors were all linked to each other according to both parent and teacher ratings. There was a significant and positive relationship between emotion regulation and behavior regulation, and both regulatory abilities were negatively associated with externalizing behaviors. These findings suggested that children with higher levels of emotion regulation and behavior regulation displayed less externalizing behaviors.

Prediction of Externalizing Behaviors

Hierarchical stepwise regression analyses were performed in order to explore the predictors of externalizing behaviors and to investigate the independent as well as interaction effects of emotion regulation and behavior regulation. First, hierarchical stepwise regression analysis was conducted for parent-reported externalizing behav-

TABLE 2
Pearson Product-Moment Correlations among All Variables (N = 100)

Variable	SES	1	2	3	4	5
Parent-rated						
1 Emotion regulation	.08					
2 Behavior regulation	.19	.46**				
3 Externalizing behaviors	.02	-.56**	-.67**			
Teacher-rated						
4 Emotion regulation	.17	.10	.11	-.18		
5 Behavior regulation	.15	.06	.24*	-.17	.64**	
6 Externalizing behaviors	-.24*	-.17	-.35**	.33**	-.57**	-.74**

* $p < .05$. ** $p < .01$.

TABLE 3
Summary of Hierarchical Stepwise Regression Analysis for
Parent-Rated Externalizing Behaviors (EB) ($N = 82$)

Outcome		Adjusted			
EB	Predictors	R	$R \leq$	Beta	β
Step 1					
	Sex			-.20	-.22 *
	SES	.05	.02	-.01	-.02
Step 2					
	Sex			-.09	-.10
	SES			.09	.14
	Parent-rated BR	.46	.44	-1.00	-.67 ***
Step 3					
	Sex			-.08	-.09
	SES			.07	.13
	Parent-rated BR			-.74	-.50 ***
	Parent-rated ER	.57	.54	-.64	-.37 ***

Note. BR = behavior regulation; ER = emotion regulation.
 * $p < .05$. ** $p < .01$. *** $p < .001$.

iors. In Step 1, sex of the child and SES of the family did not significantly predict the outcome variable ($R^2 = .05$, $F(2, 79) = 2.01$, ns). In Step 2, parent-reported behavior regulation was found to significantly predict parent-reported externalizing behaviors ($R^2 = .46$, $F(3, 78) = 22.15$, $p < .001$). In Step 3, parent-reported emotion regulation was added and it resulted in a significant increase in R^2 ($R^2 = .57$, $F(4, 77) = 25.20$, $p < .001$), and both emotion regulation and behavior regulation significantly predicted externalizing behaviors. These findings indicated that children who were higher on behavior regulation and emotion regulation displayed less externalizing behaviors in the home context. Table 3 summarizes the analysis for parent-reported externalizing behaviors.

In the second part of the regression analysis, an interaction term was created by multiplying the two variables (emotion regulation and behavior regulation) in order to examine whether the interaction between the two regulatory abilities predicted externalizing behaviors over and above each individual variable. Introduction of this interaction term ($B = -1.50$, $\beta = 5.19$) resulted in a significant change in R^2 ($R^2 = .61$, $F(5, 76) = 24.20$, $p < .001$).

Findings of regression analyses were further examined to elucidate the nature of interaction between parent-rated emotion regulation and behavior regulation. In order

to accomplish this, three levels of emotion regulation and behavior regulation which were low, medium and high were identified using medians. The median value that corresponded to the tenth percentile was taken as low, and the median values corresponding to the fiftieth and ninetieth percentiles were respectively taken as medium and high levels of emotion regulation and behavior regulation.

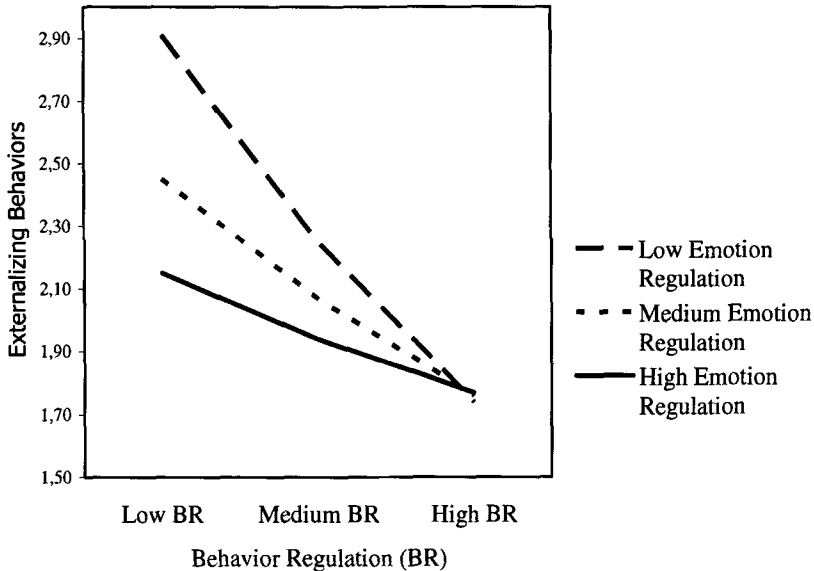
Accordingly, nine regression equations which were calculated to find the expected means for externalizing behaviors corresponded to the following conditions: (1) both of the regulatory abilities were low, (2) both of the regulatory abilities were medium, (3) both of the regulatory abilities were high, (4) emotion regulation was low and behavior regulation was medium, (5) emotion regulation was low and behavior regulation was high, (6) emotion regulation was medium and behavior regulation was high, (7) behavior regulation was low and emotion regulation was medium, (8) behavior regulation was low and emotion regulation was high, and finally (9) where behavior regulation was medium and emotion regulation was high.

The first set of equations was calculated for parent-reported externalizing behaviors. Line graphs were also computed from the expected mean values (see Figure 1). Figure 1 shows that low behavior regulation and low emotion regulation resulted in highest levels of externalizing behaviors. Levels of externalizing behaviors were lowest when behavior regulation levels were high. In this case, levels of emotion regulation did not make a difference. For every level of emotion regulation, however, behavior regulation appeared as a necessary skill for low levels of externalizing behaviors. Thus, it appeared that behavior regulation had a stronger effect on childrens' externalizing behaviors than emotion regulation. When behavior regulation levels were low or medium, externalizing behavior levels decreased as a function of emotion regulation. Higher levels of emotion regulation resulted in lower levels of externalizing behaviors. These findings suggested that emotion regulation is more critical for children who had low and medium levels of behavior regulation rather than children who had high levels of behavior regulation.

In the second hierarchical stepwise regression analysis, the criterion variable was teacher-reported externalizing behaviors. In Step One, sex of the child and SES did not significantly predict the outcome variable ($R^2 = .06$, $F(2, 79) = 2.63$). In Step Two, teacher-reported behavior regulation significantly predicted teacher-reported externalizing behaviors ($R^2 = .56$, $F(3, 78) = 33.51$, $p < .001$). In Step Three, teacher-reported emotion regulation was taken into the equation which led to a significant increase in R^2 ($R^2 = .58$, $F(4, 77) = 27.10$, $p < .001$). Results of this analysis (summarized in Table 4), as a whole, indicated that children who were higher on behavior regulation and emotion regulation displayed less externalizing behaviors in the school.

Another regression analysis was run with the interaction term for teacher-reported emotion regulation and behavior regulation ($B = -1.45$, $\beta = 5.10$), which resulted in a significant change in R^2 ($R^2 = .72$, $F(5, 76) = 38.40$, $p < .001$). Regression equations were computed in order to reveal the nature of interaction between emotion regulation and behavior regulation. The procedures explained above for parent-reported externalizing behaviors were repeated. Line graphs were also computed from the expected

FIGURE 1
Levels of Parent-Rated Externalizing Behaviors According to the
Levels of Emotion Regulation and Behavior Regulation



mean values of teacher-rated externalizing behaviors (see Figure 2). As displayed in Figure 2, low behavior regulation and low emotion regulation resulted in highest levels of externalizing behaviors, a similar pattern obtained for parent-reported variables. In the conditions of low and medium behavior regulation, externalizing behaviors changed according to the levels of emotion regulation, that is, externalizing behaviors decreased when levels of emotion regulation increased. The contribution of emotion regulation again appeared minimal for high levels of behavior regulation, despite the fact that behavior regulation was influential for externalizing behaviors, even in the conditions of high emotion regulation.

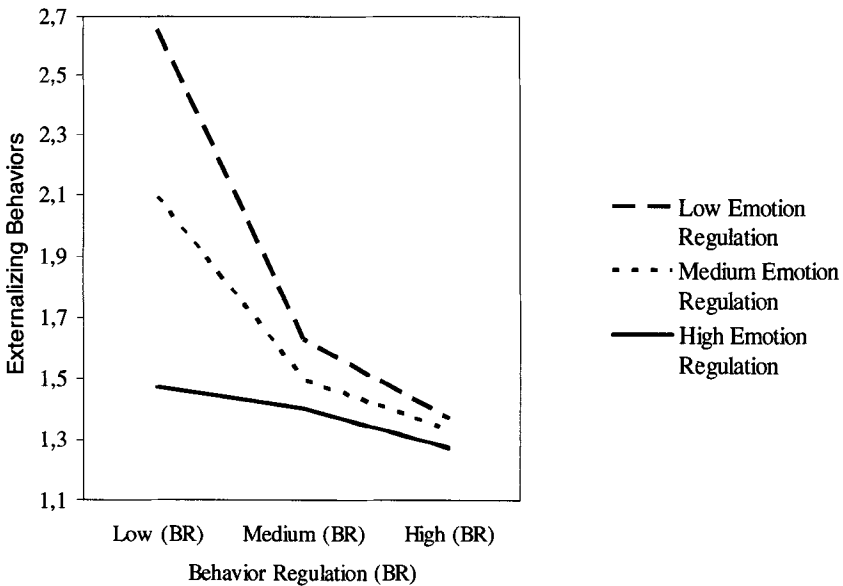
Children's overall function, at home and school contexts, was further examined and a composite score was computed by taking the average of parent- and teacher-rated variables (emotion regulation, behavior regulation and externalizing behaviors). Results of this regression analysis indicated that both emotion regulation and behavior regulation, as well as their interaction, significantly and individually predicted children's externalizing behaviors ($R^2 = .70$, $F(5, 85) = 37.36$, $p < .001$). This finding was very similar to those of the previous analyses conducted with teacher- and mother-rated data separately. However, since handling the data individually is more beneficial for a better understanding of children's regulatory abilities and problem behaviors as displayed in contexts of home and school, findings from composite scores are not further deliberated in the discussion.

TABLE 4
Summary of Hierarchical Stepwise Regression Analysis for
Teacher-Rated Externalizing Behaviors (EB) (N = 82)

Outcome		Adjusted			
EB	Predictors	R	R ²	Beta	β
Step 1	Sex			-.18	-.14
	SES	.06	.04	-.20	-.23 *
Step 2	Sex			-.15	-.11
	SES			-.11	-.13
	Teacher-rated BR	.56	.55	-1.02	-.72 ***
Step 3	Sex			-.16	-.12
	SES			-.10	.11
	Teacher-rated BR			-.85	-.59 ***
	Teacher-rated ER	.58	.56	-.37	-.20 *

Note. BR = behavior regulation; ER = emotion regulation.
 *p < .05. **p < .01. ***p < .001.

FIGURE 2
Levels of Teacher-Rated Externalizing Behaviors According to the
Levels of Emotion Regulation and Behavior Regulation



DISCUSSION

The aim of the present study was to investigate the relations among emotion regulation, behavior regulation, and externalizing behaviors in Turkish elementary school children, and to distinguish between emotion regulation and behavior regulation both at the conceptual and measurement levels. Another major aim of the study was to examine the interactive influences of emotion regulation and behavior regulation on children's externalizing behaviors. Findings of our study indicated that the two types of regulatory abilities were moderately associated with each other, and they both individually predicted externalizing behaviors in a significant way. The results also revealed that interaction between these two regulatory abilities further contributed to children's problem behaviors, providing support for distinctiveness of emotion regulation and behavior regulation.

In this study, we expected that emotion regulation and behavior regulation would be positively related to each other. The findings supported this prediction; emotion regulation and behavior regulation are positively associated, as rated by both parents and teachers. This suggests that children who were more capable of regulating their emotions were also better at behavior regulation. Previous research (Eisenberg, Cumberland et al., 2001) did not examine the links between emotion regulation and behavior regulation in general. It focused on specific aspects of the two regulatory abilities. These studies (Lewis & Stieben, 2004), which are small in number, have often reported positive relations between aspects of behavior regulation (for example, inhibitory control) and emotion regulation. For instance, Kalpidou et al. (2004) showed that preschool children with high emotion regulation abilities were also more likely to display better inhibitory control.

Other studies (for example, Eisenberg, Fabes et al., 1997) reported a similar positive link between the attention control aspect of behavior regulation (that is, attention focusing and shifting) and regulation of negative emotions (for example, anger). Children who were more capable of controlling their attention were also better at managing their anger. It seems reasonable to conclude that the significant positive association between emotion regulation and behavior regulation in Turkish children, as indicated by the present study, is similar to the findings of studies conducted with European and American children (Eisenberg, Fabes et al., 1997; Kalpidou et al., 2004). Our findings support the extant literature.

As mentioned earlier, the primary goal of this study was to explore the additive and multiplicative influences of emotion regulation and behavior regulation on children's externalizing behaviors. In general, results revealed that externalizing behaviors were predicted from both emotion regulation and behavior regulation. Children who were high on regulation (emotion regulation and behavior regulation) had lower levels of externalizing behaviors. These findings are consistent with previous studies (Eisenberg, Losoya et al., 2001) which have indicated negative links between emotion regulation and externalizing behaviors as well as between aspects of behavior regulation and externalizing behaviors. For instance, Eisenberg, Losoya et al. (2001) showed that

elementary school children who displayed low emotion regulation abilities (for example, underregulation of anger) were more prone to having behavior problems. Another study (Eisenberg, Cumberland et al., 2001) revealed that children with externalizing problems displayed control difficulties more than children who did not exhibit these behaviors. They had poor attentional and inhibitory control and were more impulsive. Results of the present study support these early findings and suggest a relation between regulatory abilities and externalizing behaviors in children.

Despite these findings, the specific nature of these relations has not been sufficiently explored. There still exist some accounts proposed to explain the underlying mechanisms. For instance, it has been suggested that children who are not able to regulate their emotions well tend to act out their feelings in physical ways, and display aggressive behavior, or they are oppositional as a way of dealing with their negative emotions (Bradley, 2000). On the other hand, inhibitory control facilitates the active inhibition of antisocial acts and the ability to regulate impulsivity reduces activity level and sensation seeking, which characterize externalizing behaviors (Rothbart, Ahadi, & Evans, 2000).

A prominent finding of our study was that the interaction between emotion regulation and behavior regulation contributed to the prediction of externalizing behaviors, and its influence was often additive. The highest levels of externalizing behaviors appeared when emotion regulation and behavior regulation were both low. Externalizing behaviors varied as a function of behavior regulation for all levels of emotion regulation. In other words, children who had low, medium, and high levels of emotion regulation displayed less externalizing behaviors if they were better at regulating their behaviors.

It is, however, intriguing that although behavior regulation appeared to be an important influence on externalizing behaviors even in very high levels of emotion regulation, the contribution of emotion regulation was minimal for children who were good at regulating their behaviors. Behavior regulation, when high, predicted low externalizing behaviors by itself and only for low and medium levels of behavior regulation. Externalizing behaviors decreased as a function of emotion regulation.

An interesting aspect of these findings is the suggestion that children with very high levels of behavior regulation are likely to show less externalizing behaviors even if they are not very good at regulating their emotions. Children who may well be able to regulate their emotions may still display externalizing behaviors if they have relatively poor behavior regulation. These findings indicate that all levels of behavior regulation and emotion regulation interact to predict externalizing behaviors, other than high behavior regulation, which appears sufficient for preventing externalizing problems.

It is worth noting that these findings are difficult to interpret in light of previous research, due to conceptual and measurement overlap between emotion regulation and behavior regulation. Some researchers (for example, Eisenberg, Guthrie et al., 2000) define emotion regulation in terms of attentional processes (for example, attention shifting and focusing) and assess emotion regulation by measures which do not involve items that tap emotional displays. It is important to emphasize that in the present

study, attention control was taken as an aspect of behavior regulation because the items that assessed this skill were not relevant to the management of attention with respect to emotions, but was related to attentional control as involved in behavior regulation (Lengua, 2003).

Despite the fact there is some overlap between the two regulatory abilities as examined by previous research, some support for findings of the present study come from studies which have investigated the role of negative emotionality and behavior regulation in children's externalizing behaviors. As described in the early paragraphs of this paper, emotionality refers to the frequency and intensity of emotional reactions (Rydell et al., 2003) that captures some but not all aspects of emotion regulation, which is a broader concept that also includes the maintenance and enhancement of emotions. Hence, studies examining the relations of emotionality and behavior regulation to children's externalizing behaviors can be informative.

In one such study, Eisenberg, Guthrie et al. (2000) found that children who had poor behavior regulation abilities (for example, low inhibitory control and high impulsivity) displayed more externalizing behaviors, regardless of being high or low on negative emotionality.

Authors (Eisenberg, Guthrie et al., 2000) argued that externalizing behaviors such as stealing are often performed with a desire to obtain a goal, even when one is not emotionally aroused. Some types of aggression are also organized, unemotional, and targeted at satisfying a need or a desire. Therefore, in some cases, behavior regulation might be more central to externalizing behaviors than emotion regulation.

It should be noted that, in the present study, the item which assessed stealing was dropped from the externalizing behavior scale due to its low range value, but there were some others which were still more related to the aspects of behavior regulation and did not refer much to emotional displays. For example, lying behavior is more related to the ability to plan and suppress inappropriate responses, and hence, reflects a problem in the inhibitory control aspect of behavior regulation. Similarly, teasing and provoking peers are behaviors which do not have strong emotional components. These items were very few in number, and thus, this argument is unlikely to hold for the stronger influence of behavior regulation.

On the other hand, it might also be argued that the emotion regulation scale used in the present study tapped many different aspects of this skill, such as enhancement and inhibition of a wide array of emotions, including sadness and happiness. Externalizing behaviors are related more to the inability to regulate feelings of anger and frustration (Eisenberg, Cumberland et al., 2001). It is possible that if our scale of emotion regulation involved more items assessing the ability to modulate such negative affect, emotion regulation and externalizing behaviors could be more closely linked, and emotion regulation could then have continued to exert an important influence on externalizing behaviors, even in conditions of high behavior regulation.

These suggestions are tentative and made with an attempt to explain the relatively strong role of behavior regulation in externalizing behaviors, as predicted by the interaction with emotion regulation. This finding may be of special importance since eluci-

dating relative contributions of the two distinct regulatory abilities is central to understanding the development of externalizing behaviors in children.

With respect to sex differences, it was expected that girls would display better emotion regulation and behavior regulation abilities, and less externalizing behaviors than boys. Our results were in line with these predictions; however, the difference between boys and girls did not approach statistical significance. The lack of a considerable sex difference found in the present study can be explained by the development of gender roles. Children learn their gender roles and conform to what is expected of them as boys or as girls, as a result of the different socialization processes they experience (Beal, 1994). Social roles attributed to boys and girls discourage females to display overt antisocial behaviors, whereas these behaviors are tolerated and viewed as more legitimate for boys. Similarly, failure to regulate certain behaviors (for example, impulsive behaviors) and emotions (for example, expressing anger) might be tolerated more in boys than in girls (Beal, 1994; Zahn-Waxler et al., 1994). Socialization processes are effective in reinforcing gender roles in boys and girls.

It has been reported that although major development in learning gender roles occurs between the ages of five and seven, these roles get stronger during elementary school years (Carter & Patterson, 1982; Golombok & Hines, 2002) and older children often display behaviors that are more consistent with their gender roles than do younger children. This usually results from the context of school, which is a special setting that tends to increase adherence to traditional gender roles (Beal, 1994). An implicit educational goal of schooling, referred to as the *hidden curriculum*, is to teach children the behaviors that are considered appropriate for boys and girls in society. In accordance, teachers tend to enhance assertiveness more in boys while encouraging girls to be quiet and agreeable. Extended contact with peers is also suggested as a factor that increases compliance to traditional gender roles in the school setting (Beal, 1994).

It might be claimed that since children in the present study were second graders who completed one year of schooling, they did not have sufficient experience with their teachers and peers. A study conducted with older children might reveal a bigger difference between girls and boys with respect to their regulatory abilities and behavior problems.

Another study (Batum & Yagmurlu, 2005) in which we compared seven—and nine-year-old Turkish elementary school children with respect to their regulatory abilities and externalizing behaviors supported these assumptions. Nine-year-old girls were better at regulating their emotions and behaviors and displayed less externalizing behaviors than nine-year-old boys. There were no differences, however, between seven-year-old girls and boys.

As prominent findings have been reviewed, it has to be mentioned that a strong point of the study was the inclusion of multiple raters providing information about children's behaviors reported to vary widely across home and school contexts. Results of the present study also revealed mild agreement between parents and teachers with regard to children's regulatory abilities and externalizing behaviors. In regression analyses, predictions were not usually significant across reporters as well. Nevertheless,

obtaining information from both parents and teachers showed how children's behaviors might differ in various contexts.

It might be argued that the study has a shortcoming relating to its methodology that depended solely on parent and teacher ratings, but did not involve behavioral assessments (for example, individual tasks or observations). It is, we believe, necessary to emphasize that the major aim of the current study was to clarify the relations among emotion regulation, behavior regulation and externalizing behaviors, as a way of solving the problem of *contaminating* measures.

As discussed, previous studies (for example, Eisenberg, Guthrie et al., 2000) used emotion regulation and behavior regulation interchangeably, which sometimes led to an overlap between measures of the two regulatory abilities. The basic idea behind our study was to form uncontaminated measures for each of these variables by eliminating confounding items on the relevant scales. Scales were chosen purposely as the sole method of assessment. Future studies that make use of additional measures such as observations and behavioral assessments would certainly be important to strengthen the distinction suggested here.

Overall, findings of the present study suggest several directions for future inquiry. First, results show that emotion regulation and behavior regulation are two distinct regulatory abilities with additive influences on externalizing behaviors. Future studies should treat emotion regulation and behavior regulation as separate constructs. This necessitates distinguishing between what constitutes emotion regulation and behavior regulation first at the conceptual level and second, forming unadulterated measures of the two regulatory abilities. Another possible direction for future research would be to test causal models for relations among emotion regulation, behavior regulation and externalizing behaviors with longitudinal data, which could reveal the direction of the relations and pathways.

The present study was the first attempt to examine the distinction between emotion regulation and behavior regulation, as well as the influence of these abilities on Turkish children's behavior problems. We believe that our results should be taken as preliminary findings. They need to be replicated by future studies using behavioral assessments of emotion regulation and behavior regulation together with scale measures. This would allow examining whether the constructs assessed by the scales reliably tap the very same behaviors as assessed by individual tasks and observational measures of these variables.

Our findings also appear to have important implications for interventions targeting reducing or preventing the development of externalizing behaviors. Our results show that children displayed more externalizing behaviors if their emotion regulation and behavior regulation were both low. Behavior regulation had a stronger influence on externalizing behaviors only when it was very high. On the other hand, children with low and moderate behavior regulation displayed less problem behaviors if they were better at regulating their affect. This outcome indicates that emotion regulation is often as important as behavior regulation in the prediction of externalizing behaviors. Interventions with young children may be more effective in reducing or preventing exter-

nalizing behaviors if they target teaching children to regulate their emotions and behaviors simultaneously, rather than focusing solely on a single regulatory ability.

In conclusion, the present study points out the necessity of treating the two regulatory abilities as separate phenomena in the prevention of externalizing behaviors. Externalizing behaviors in early years leads to problems (for example, problems in social relationships and low self-esteem) in adolescence and adulthood (Bradley, 2000). They require early identification and intervention, but ideally prevention. This calls for an examination of the mechanisms underlying externalizing behaviors through carefully-designed studies. The present study is one such attempt and our findings revealed that emotion regulation and behavior regulation are distinct dimensions operating together in relation to children's externalizing behaviors. Therefore, we believe they should be examined simultaneously in models of children's behavior problems.

NOTES

Authors of the ERC (Shields & Cicchetti, 1997) have also used a total score of emotion regulation in some of their studies (Shields & Cicchetti, 1997) by combining the Liability/Negativity and Emotion Regulation subscales.

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