A R T I C L E

ETIOLOGY OF PRESCHOOL BEHAVIOR PROBLEMS: CONTRIBUTIONS OF TEMPERAMENT ATTRIBUTES IN EARLY CHILDHOOD

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ABSTRACT: The present study was conducted to examine the contributions of early appearing temperament attributes to toddler and preschool-age behavior problems. High levels of negative emotionality and low levels of effortful control were linked to both externalizing and internalizing difficulties. All fine-grained dimensions of negative affect were concurrently associated with internalizing problems whereas relations between components of negative affect and externalizing were observed only for frustration, sadness, and low falling reactivity. Higher surgency was associated with increased risk for externalizing behaviors whereas low surgency increased the likelihood of internalizing problems. Trait-by-trait moderation occurred, such that negative emotionality was most closely related to behavior problems when orienting/regulatory capacity or effortful control was low or when infant surgency was high. Results of this study have implications for theory linking temperament and psychopathology, and clinical applications utilizing temperament assessment to prevent behavior problems.

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In this article, we investigate the origins of children's behavior problems in temperamental characteristics of infancy and early childhood. Childhood behavior problems are seen to form two broadband domains, externalizing and internalizing, with externalizing problems including undercontrolled, acting-out behaviors such as conduct difficulties, hyperactivity, and impulsivity, and internalizing problems involving experiences of distress (e.g., sadness/depression, worry/anxiety) that represent reactions directed inward (Achenbach, 1966; Achenbach & Rescorla, 2004).

Externalizing problems often emerge during the preschool period, typically include aggressive and noncompliant behaviors, are thought to be maintained through coercive parent–child interactions, and are associated with peer rejection and suboptimal academic progress (Campbell, Spieker, Burchinal, & Poe, 2006; Masten et al., 2005; McLeod & Fettes, 2007; Patterson, 1982; Patterson, Reid, & Dishion, 1998). Internalizing problems peak later in childhood, and frequently in adolescence; nonetheless, early manifestations of internalizing difficulties can be observed in the preschool period (Achenbach & Rescorla, 2004). Internalizing problems have been related primarily to later mental health difficulties, especially an increased risk for symptoms of depression (Frost, Reinherz, Pakiz-Camras, Giaconia, & Lefkowitz, 1999; Lewinsohn et al., 1994).

Temperament has been defined as constitutionally based individual differences in reactivity and self-regulation (Rothbart, 2011; Rothbart & Derryberry, 1981), collectively implicated as providing the basis for the development of behavior problems. Higher order temperament constructs have been extracted from parent- and self-report measures, including negative emotionality, positive affectivity/surgency, and effortful control. Effortful control was identified in the toddler years and beyond whereas negative emotionality, positive affectivity/surgency, and orienting/regulatory capacity factors were extracted in infancy (Gartstein & Rothbart, 2003; Putnam, Ellis, & Rothbart, 2001). Previous studies relating temperament and behavior problems have largely relied on

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TABLE 1. *Labels, Definitions, and Factor Affiliation of the IBQ-R,the ECBQ, and the CBQ Scales*

Factor	Label	Definition	IBQ-R	ECBQ	CBQ
Surgency					
	Activity Level	Gross motor activity, including rate and extent of movement.	Sur	Sur	Sur
	High-Intensity Pleasure	Pleasure or enjoyment related to high stimulus intensity, rate, complexity, novelty, and incongruity.	Sur	Sur	Sur
	Positive Anticipation	Excitement in the anticipation of pleasurable activities.Includes rapid approach in IBQ-R	Sur	Sur	Sur
	Impulsivity	Speed of response initiation.		Sur	Sur
	Sociability	Seeking and taking pleasure in interactions with others		Sur	
	Vocal Reactivity	Vocalization during daily activities	Sur		
Negative Affect					
	Falling Reactivity	Rate of recovery from peak distress, excitement, or general arousal; ease of falling asleep. Also includes soothability items in ECBQ and CBQ.	Neg	Neg	Neg
	Fear	Negative affect related to anticipated pain, distress and/or threat. Includes startle and reactions to novelty and social stimuli in IBQ-R.	Neg	Neg	Neg
	Frustration/Distress to Limitations	Negative affect related to confinement, interruption of ongoing tasks or goal blocking.	Neg	Neg	Neg
	Sadness	Negative affect, tearfulness or lowered mood related to physical state, disappointment, loss, and/or response to other's suffering.	Neg	Neg	Neg
	Discomfort	Negative affect related to sensory qualities of stimulation, including intensity, rate or complexity of light, sound, and texture.		Neg	Neg
	Motor Activation	Repetitive small motor movements; fidgeting		Neg	
Orienting/Regulatory Capacity/Effortful Control					
	Attention/Duration of Orienting	Capacity to sustain attention on an object or task. Also includes ability to shift attention on CBQ.	Orc	Eff	Eff
	Low-Intensity Pleasure	Pleasure or enjoyment related to low stimulus intensity, rate, complexity, novelty, and incongruity.	Orc	Eff	Eff
	Affiliation/Cuddliness	Desire for, and pleasure in, warmth and closeness with others, independent of shyness or extraversion.	Orc	Eff	
	Inhibitory Control	Capacity to suppress inappropriate actions or responses. Includes planning capabilities in CBQ.		Eff	Eff
	Attentional Shifting	Ability to transfer attentional focus from one object or task to another.		Eff	
	Soothability	Reduction of fussing, crying, or distress when soothing techniques are used by the caretaker.	Orc		
Inconsistent across ages					
	Perceptual Sensitivity	Detection of slight, low-intensity stimuli from the external environment.	Sur	Neg	Eff
	Shyness	Slow or inhibited approach and/or discomfort in social situations.		Neg	Sur
	Smiling and Laughter	Positive affect in response to changes in stimulus intensity, rate, complexity, and incongruity.	Sur		Eff

IBQ = Infant Behavior Questionnaire-Revised; ECBQ = Early Childhood Behavior Questionnaire; CBQ = Children's Behavior Questionnaire; Sur = Surgency; Neg = Negative Emotionality; Eff = Effortful Control.

such broad, undifferentiated higher order constructs or on a limited number of specific temperament traits, with reactivity often not separated from self-regulation (Muris & Ollendick, 2005). In this article, we aimed to relate more fine-grained measures of temperament, including regulatory/attentional aspects along with reactivity, in infancy, toddlerhood, and early childhood, to the development of externalizing and internalizing behaviors (see Table 1 for definitions and factor affiliations of fine-grained temperament dimensions).

NEGATIVE EMOTIONALITY

Negative emotionality has been linked conceptually and empirically to the personality trait of neuroticism in adulthood (Evans &

Rothbart, 2007). Developmentally, negative emotionality is one of the first temperament attributes to emerge (e.g., Rothbart, 1989). Negative affectivity assessed in infancy predicted distress in the preschool period (Putnam, Rothbart, & Gartstein, 2008), and stability in negative emotionality constructs by the toddler years has been reported (e.g., Lemery, Goldsmith, Klinnert, & Mrazek, 1999).

A large body of literature has related temperamental negative emotion to both externalizing- and internalizing-type behaviors (Rothbart, 2011; Rothbart & Bates, 2006; Thomas, Chess, & Birch, 1968). For example, higher levels of negative emotionality in infancy and early childhood predicted mothers' ratings of internalizing problems (i.e., anxiety/depression) at 7 years of age (Rende, 1993). Infant negative emotionality accounted for 4% of variance in internalizing symptoms, with preschool emotionality explaining an additional 4% in later anxiety/depression.

Anger/frustration has been found to predict both internalizing and externalizing problems, with fear and sadness making more substantial contributions to internalizing difficulties (Lengua, 2006; Nigg, 2006; Oldenhinkel, Hartman, De Winter, Veenstra, & Ormel, 2004; Rothbart & Bates, 2006). Fear was linked with internalizing problems and frustration with externalizing problems in a sample of preadolescents, with generally converging findings emerging for parent and child report of behavior problems (Oldenhinkel et al., 2004). A number of studies have demonstrated connections between early behavioral inhibition, a construct closely linked to fear, and later internalizing symptoms such as social anxiety (e.g., Schwartz, Snidman, & Kagan, 1999).

In this study, we examined negative emotionality generally and more specifically through measures of physical discomfort, fear, anger, and sadness. In addition, we included the attribute of falling reactivity, the infants' ability to lower his or her level of arousal and/or distress, which also has clustered with the negative emotionality fine-grained scales, showing an inverse relationship with the remainder of the negative emotionality components (Gartstein & Rothbart, 2003).

SURGENCY

Surgency in infancy is largely manifested through smiling, laughing, activity, appreciation of high-intensity stimulation, and approaching novel stimuli (Gartstein & Rothbart, 2003; Rothbart, 1989). The surgency factor label is frequently used interchangeably with the terms *positive emotionality* and *extraversion*, including characteristics of enthusiasm, activity, approach tendencies, and sociability (e.g., Rothbart & Ahadi, 1994). Individuals higher in positive affect have the tendency to be engaged, rather than disengaged, with their environment (Lonigan, Phillips, & Hooe, 2003), presumably because of stronger approach tendencies (Rothbart, Ahadi, & Hershey, 1994; Rothbart & Hwang, 2005; Windle, 1995).

Although components of surgency have been most closely associated with externalizing behavior (Rothbart & Bates, 2006), Fowles (1994) proposed that internalizing problems, particularly those of a depressive nature, are due to low activity in behavioral approach systems, suggesting that low surgency may be linked to internalizing problems. Consistent with this hypothesis, Dougherty, Klein, Durbin, Hayden, and Olino (2010) found that a positive affectivity factor comprised of sociability, interest, and positive emotion, observed in the laboratory and at home at 3 years of age, predicted lower depressive symptoms at age 10, even after taking into account earlier negative affectivity and depressive symptoms. Lonigan, Carey, and Finch (1994) found that measures of low surgency (i.e., low interest and/or low motivation) discriminated between referred children diagnosed with depressive disorders and those with anxiety disorders. In this study, we investigated surgency generally, and more specific temperament dimensions of activity level, impulsivity, approach, sociability/shyness, and pleasure to high-intensity stimuli.

EFFORTFUL CONTROL AND REGULATORY CAPACITY/ORIENTING

The period of infancy to preschool age is a time of major changes in the regulative aspects of temperament, including a shift from an orienting-based regulatory system to systems of effortful control (Rothbart, Sheese, Rueda, & Posner, 2011). Beginning in the toddler period, a number of temperament characteristics related to self-regulation have been shown to contribute to a broad dimension referred to as *effortful control* (Posner & Rothbart, 2007; Rothbart & Rueda, 1995). The emergence of effortful control coincides with rapid development of the brain's executive attention system, influenced by lateral prefrontal cortex and anterior cingulate regions of the brain (Rothbart, Derryberry, & Posner, 1994; Posner & Rothbart, 2007). Structurally, effortful control includes consciously focusing and shifting attention, inhibiting or activating a response as a situation necessitates it, and the capacity for enjoyment of low-intensity activities (Putnam, Gartstein, & Rothbart, 2006; Rothbart, Ahadi, Hershey, & Fisher, 2001).

In infancy, prior to the development of effortful control, a regulation-related temperament factor related to orienting has been identified (Gartstein & Rothbart, 2003). Measures of this early marker of regulation-related processes was shown to predict later effortful control (Gartstein, Slobodskaya, Putnam, & Kinsht, 2009; Gartstein, Young, & Bridgett, 2008), and regulatory capacity/orienting is potentially important in understanding the etiology of preschool behavior problems. Rothbart et al. (2011) proposed a developmental model in which regulation of reactivity is first offered by the orienting system and later offered chiefly by the executive attention system.

Effortful control also has been found to play a role in shaping both externalizing and internalizing problems, with a stronger influence often reported for externalizing difficulties. For example, Gartstein and Fagot (2003) found that lower effortful control remained a significant predictor of increased externalizing difficulties for preschoolers, after controlling for child gender, parental depression, and coercive behaviors, as well as marital adjustment, with consistent effect sizes observed for both mother- and father-report ($R^2 = .24$ and $R^2 = .23$, respectively). Oldenhinkel et al.

(2004) found that effortful control was the primary temperament predecessor to externalizing behavior, with the effect size exceeding .50. Eisenberg and Morris (2002) suggested that whereas all aspects of effortful control are implicated in the etiology of externalizing, predictions of internalizing problems will be most pronounced for scales of attentional focusing and shifting. Consistent with this assertion, Eisenberg et al. (2009) found deficits in attentional control to predict high and increasing levels of internalizing problems from 6 to 10 years of age.

In this study, we investigated effortful control and regulatory capacity/orienting generally, and the more specific attributes of attention focusing, attention shifting, inhibitory control, low-intensity pleasure, cuddliness, perceptual sensitivity, soothability, and smiling and laughter, differentially associated with these factors across early childhood (see Table 1 for factor affiliation).

Temperament × Temperament Interactions

In addition to independent contributions of temperament factors, potential moderator effects, as seen in Trait × Trait interactions, also have been proposed, most typically with the regulation factor moderating the impact of negative emotionality (Nigg, 2006; Rothbart & Bates, 2006). Rothbart and Bates (2006) noted that regulatory or control systems would be expected to moderate the impact of more reactive systems, so that for a child with higher levels of negative emotionality, greater effortful control would allow for more flexible, and presumably adaptive, emotional reactions. Consistent with this theoretical formulation, Eisenberg et al. (2001) found an interaction effect wherein lower effortful control in combination with higher anger/frustration resulted in maladjustment. Similarly, Belsky, Friedman, and Hsieh (2001) reported that infants low in attentional persistence and high in negative emotionality experienced greater difficulties in social competence 16 months later, as compared to infants high in attentional persistence. Thus, persistence of orienting/effortful control moderated the impact of child negative affectivity on behavioral outcomes, with low levels of attention/regulation leading to increased risk for problem behaviors.

In this study, we anticipated that infancy orienting/regulatory capacity and toddler/preschool-age effortful control would buffer the impact of negative emotionality on behavior problems. Because Dougherty et al. (2010), Joiner and Lonigan (2000) and Gurshuny and Sher (1998) found that negative affect is most closely related to depressive symptoms in the context of low positivity, we also expected that surgency could buffer the effect of negative affectivity for internalizing problems. We expected high levels of negative emotionality and low levels of effortful control to be linked to both externalizing and internalizing difficulties, although effortful control was expected to demonstrate a stronger relationship to externalizing problems.

At the fine-grained level, we anticipated that anger/frustration would contribute primarily to externalizing whereas fear and sadness would make more substantial contributions to internalizing difficulties. Elevated surgency was expected to be associated with an increased risk for externalizing behaviors, with low surgency being linked to increases in the likelihood of internalizing problems; however, our examination of specific dimensions of this factor was largely exploratory because no prior studies have examined fine-grained aspects of surgency in relation to behavior problems and because theory is scant regarding several of these dimensions. Although all components of effortful control were expected to predict externalizing behaviors, attentional focusing and shifting were hypothesized to make the primary contributions to internalizing difficulties. In both cases, inverse/protective relationships were expected.

METHODS

Participants

A community sample of primary caregivers (90% mothers) of 361 (181 female) infants from a small city in the Northwest United States was initially recruited and administered the Infant Behavior Questionnaire-Revised (IBQ-R). Infants were about equally distributed across three age groups: 3 to 6 months, 6 to 9 months, and 9 to 12 months (M age = 33.14 weeks, SD = 11.07). Participants were recruited by telephone based on birth announcements published in the local paper. Nearly all participants were Caucasian and married. The sample was primarily middle class, with an average family income of $41,798 ($SD$ = $19, 154) and an average revised Duncan Socioeconomic Index (Stevens & Featherman, 1981) of 54.12 (SD = 19.20). Primary caregivers' average age was 31.10 (SD = 5.30) years, and they had completed an average of 14.51 (SD = 2.40) years of education. Additional details regarding recruitment and characteristics can be found in Gartstein and Rothbart (2003).

From this initial group of 361, primary caregivers of 249 (125 female) children completed the Early Childhood Behavior Questionnaire (ECBQ). Comparisons of those who did and did not participate revealed no significant differences in education level, yearly income, respondent age, or any of the temperament variables assessed during infancy. To supplement this sample, families of 68 (39 female) additional children were recruited. Demographic information was not gathered from these 68 families, but the similarity in recruitment strategy allows some degree of confidence that they represent the same population as the original sample. The total sample of 317 children (164 female; M age = 24.96 months, SD = 3.62) was roughly equally distributed across three age groups: 18 to 22 (n = 103) months, 23 to 26 (n = 110) months, and 27 to 32 months (n = 104). Four caregivers failed to complete the Child Behavior Checklist for 2- and 3-year-olds (CBCL 2/3; Achenbach, Edelbrock, & Howell, 1987) at this time (for further details, see Putnam et al., 2006).

Of the 317 participants who completed the ECBQ, 187 (101 female) completed the Children's Behavior Questionnaire (CBQ; Rothbart et al., 2001). The Time 3 subsample was normally distributed with respect to child age (M = 49.51, SD = 4.81) and included 142 children (75 female) whose primary caregiver had

completed both the IBQ-R and the ECBQ, and 45 (26 female) whose parent only completed the ECBQ. When demographics, infant temperament, and toddler temperament of participants who took part in all three assessments were compared with those who dropped out of the study between infancy and childhood, only 2 of 36 *t* tests were significant. Infants who remained in the study were rated by parents as being higher in IBQ-R Sadness, $t(357) = 2.54$, $p < .05$, and lower in IBQ-R Soothability, $t(358) = 2.04$, $p < .05$, than were infants who were lost to attrition. Analyses conducted with a portion of the present sample have been reported elsewhere (Gartstein & Rothbart, 2003; Putnam, Gartstein, & Rothbart, 2006; Putnam et al., 2008); however, these prior reports did not address the associations between temperament and behavior problems examined in this study.

Procedure

Parents of infants between 3 and 12 months of age whose births were reported in the local newspaper were contacted by telephone. Potential participants were told that their participation would involve completing a consent form, the IBQ-R (interim version), and a demographic form, and that completing the forms would take approximately 1 hr. Participating caregivers also were informed that they would receive a self-addressed, stamped envelope to return the completed forms and a check for $5 for their participation. Of 476 parents contacted, 361 (76%) completed the measures (for additional details, see Gartstein & Rothbart, 2003). When children were between the ages of 18 and 32 months, parents were again contacted by telephone and by mail, then mailed a consent form, the ECBQ (interim version), the CBCL, a self-addressed, stamped envelope, and either a check for $5 or a $5 gift certificate to a local toy store (for details, see Putnam et al., 2006). When the children whose caregivers had completed the toddler assessment (including the ECBQ and the CBCL) were between 37 and 59 months old, parents were sent the CBQ and the CBCL, a self-addressed, stamped envelope and a $5 check. Three weeks after this mailing, parents who had not returned completed forms were contacted by telephone, and 3 weeks after these calls, a final reminder letter was sent. Of the 130 families who dropped out between the ECBQ/CBCL and the CBQ/CBCL assessments, 11 had relocated with no forwarding information available, 37 declined to participate when contacted by telephone, 13 failed to return forms despite agreeing to participate when contacted by telephone, and 69 could not be reached by telephone. All participating parents signed informed consent forms for each assessment conducted in the context of this study.

Materials

The IBQ-R (Gartstein & Rothbart, 2003), the ECBQ (Putnam et al., 2006), and the CBQ (Rothbart et al., 2001) are parent-report instruments containing items referring to signs of child reactivity and regulation in commonly occurring situations. For each item, parents are asked to rate the child on a Likert-type scale of 0 to 6. The IBQ-R and the ECBQ items are phrased in the form of questions about the child's behavior in a given context during the past 1 or 2 weeks (e.g., "When being carried in the past week, how often did the baby push against you until put down?"), and the ratings refer to frequency of behavior (*never*, *very rarely*, *less than half the time*, *half the time*, *more than half the time*, *almost always*, *always*). The CBQ items are statements describing child behavior within specified contexts (e.g., "My child gets angry when told he or she needs to go to bed"), and the ratings refer to the degree to which the statement accurately describes the child (*extremely untrue*, *quite untrue*, *slightly untrue*, *neither true nor untrue*, *slightly true*, *quite true*, *extremely true*).

The sample used in the current study contributed to the refinement of the IBQ-R and the ECBQ, such that participants received interim versions of the instruments containing some items that were ultimately discarded due to statistical and conceptual considerations (see Gartstein & Rothbart, 2003; Putnam et al., 2006). The interim IBQ-R contained 251 items, 67 of which were eliminated prior to creating scale scores. The interim ECBQ contained 267 items, 66 of which were removed.

Table 1 contains the labels and definitions for the scales included in these three instruments. Several scales, such as High Intensity Pleasure and Frustration/Distress to Limitations, are used in each of the measures whereas others appear on only one or two of the instruments. Cronbach's αs for the 14 scales of the IBQ-R ranged from .70 to .90. Alphas for the ECBQ ranged from .61 to .89. CBQ scale alphas ranged from .61 to .94. As discussed in the introduction, factor analyses of each instrument had identified three-factor solutions. Scores corresponding to these factors were created by performing principal axis factor analyses on scale scores, rotating extracted factors using the Oblimin algorithm, and saving the variables created by the regression method (Norusis, 1994).

To rate children's internalizing and externalizing problem behaviors, primary caregivers completed the CBCL 2/3 (Achenbach et al., 1987), which contains empirically derived narrow and broadband syndrome scales. Parents responded to items using a scale of 0 to 2 indicating that a behavioral description is *not true*, *somewhat or sometimes true*, or *very or often true* of their child. The standard scoring approach recommended by Achenbach et al. (1987) was followed, summing symptom/problem scores for the items relevant to each scale of interest. Satisfactory psychometric properties have been consistently demonstrated for the CBCL (Achenbach et al., 1987). In the present study, the internalizing scale assessing social withdrawal and depression was internally consistent at T2 and T3, with αs = .77, and .83, and stable from T2 to T3, $r(185) = .61$, $p < .01$. The externalizing scale measuring aggressive and destructive tendencies also was internally consistent, mαs = .92, and .93, and longitudinally stable $r(185) = .64$, $p < .01$. Correlations between internalizing and externalizing were $r(313) = .54$ at T2, and $r(187) = .56$ at T3.

Relations between temperament and behavior problems were investigated at both factor and discrete trait levels. Because temperament is considered a more basic aspect of functioning,

TABLE 2. *Correlations Between Toddler and Childhood Fine-Grained Temperament and Behavior Problems*

		Internalizing		Externalizing	
Scale		T2 ($n = 313$)	T3 ($n = 187$)	T2 ($n = 313$)	T3 ($n = 187$)
High-Intensity Pleasure	ECBQ		.20		
	CBQ	–		–	
Activity Level	ECBQ			.39	.36
	CBQ	–		–	.41
Impulsivity	ECBQ				
	CBQ	–		–	.41
Positive Anticipation	ECBQ				
	CBQ	–		–	.26
Sociability	ECBQ	−.23			
Smiling and Laughter	CBQ	–		–	
Shyness	ECBQ	.42			
	CBQ	–	.40	–	
Frustration	ECBQ	.28	.38	.55	.45
	CBQ	–	.35	–	.53
Sadness	ECBQ	.35	.29	.25	.23
	CBQ	–	.34	–	.25
Discomfort	ECBQ	.32			
	CBQ	–	.38	–	
Fear	ECBQ	.24	.22		
	CBQ	–	.29	–	
Falling Reactivity	ECBQ	−.30	−.25	−.33	−.34
	CBQ	–	−.35	–	−.54
Motor Activation	ECBQ	.25		.33	.33
Perceptual Sensitivity	ECBQ				
	CBQ	–		–	
Attention Focusing	ECBQ	−.20	−.24	−.41	−.32
	CBQ	–	−.26	–	−.56
Inhibitory Control	ECBQ		−.23	−.55	−.37
	CBQ	–		–	−.60
Low-Intensity Pleasure	ECBQ	−.21		−.36	
	CBQ	–		–	−.33
Attention Shifting	ECBQ	−.21		−.36	
Cuddliness	ECBQ			−.31	

Note. For all correlations presented, $p < .05$ in two random subsamples (Blank cells indicate correlations $p > .05$ in one or both subsamples.) Dashes represent correlations between T2 behavior problems and T3 temperament (not calculated for conceptual reasons). ECBQ = Early Childhood Behavior Questionnaire; CBQ = Children's Behavior Questionnaire.

temperament scores at one age were analyzed in relation to later, but not earlier, indices of behavior problems. The theoretical/conceptual benefits of examining fine-grained temperament dimensions are coupled with a concern regarding an elevated potential for Type-I error, due to multiple statistical tests. This problem is typically handled by employing the Bonferroni or similar procedures, but with very large numbers of tests, the Bonferroni correction is considered by many to be excessively conservative (Sankoh, Huque, & Dubey, 1997). We have employed an alternative procedure recommended by Uitenbroek (1997), dividing our sample into two random halves and only reporting correlations that exceeded the traditionally accepted $p < .05$ in both samples, such that significance would be obtained at random only once in 400 tests. Thus, correlations reported in Table 2 were significant in both random subsamples; however, we presented coefficients that were calculated using the entire sample to most accurately represent these relations.

RESULTS

Negative Emotionality

As predicted, broad negative emotionality predicted both externalizing and internalizing problems. Externalizing problems at T3 (preschool) were associated with high negative affectivity at all time points, predicted from the IBQ-R (infant), the ECBQ (toddler), and the CBQ (child), rs(141, 186, 187) = .23, .35, .43, ps < .01, respectively. Externalizing scores at T2 (toddlers) in the toddler period also were related to high infant IBQ-R and toddler ECBQ negative affectivity, rs (244, 312) = .17, .36, ps < .01,

respectively. Internalizing problems at T3 (preschool) were linked to high negative affectivity at all time points, infant, toddler, and childhood IBQ-R, ECBQ, and CBQ, *r*s(141, 186, 187) = .35, .38, .50, *p*s < .01, respectively, and higher Internalizing scores at T2 (toddlers) were associated with high levels of infant negative affectivity as well as concurrent toddler negative affectivity, *r*s(244, 312) = .24, .43, *p*s < .01, respectively.

The expectation that specific negative affects would be differentially related to internalizing and externalizing difficulties was only partially met. Infant anger and sadness were positively correlated with preschool internalizing, *r*s(142) = .33, .21, $p < .01$, respectively. Infant falling reactivity was negatively correlated and sadness positively correlated with internalizing at T2, $r(245) = -.23, .21$, $p < .01$, respectively. Infant sadness also was correlated with toddler externalizing, $r(245) = .21$, $p < .01$. All dimensions of negative affect were concurrently associated with internalizing; and frustration, sadness, fear, and (low) falling reactivity in toddlerhood were predictive of preschool internalizing behavior (Table 2). Relations between components of negative affect and externalizing were somewhat more specific. Frustration, motor activation, sadness, and (low) falling reactivity were concurrently and longitudinally associated with externalizing, but fear and discomfort were not. In addition, Fisher's Z tests indicated that frustration was more strongly linked to externalizing than to internalizing, and was more strongly related to externalizing than sadness, *p*s < .05.

Surgency

Neither broad nor narrow aspects of infant surgency predicted behavior problems at either the toddler or the preschool periods. High toddler and preschool surgency were linked to preschool externalizing behavior, *r*s(186, 187) = .30, .34, *p*s < .01, respectively. Higher toddler surgency also was related to concurrent externalizing problems, $r(312) = .30$, $p < .01$. In the preschool period, surgency was concurrently negatively correlated with internalizing, $r(187) = -.20$, $p < .05$.

As shown in Table 2, activity level was strongly associated, both concurrently and longitudinally, with externalizing. High intensity pleasure also predicted concurrent toddler externalizing problems, and high levels of impulsivity and positive anticipation were concurrently linked to preschool externalizing behaviors. Although the broad surgency factor was unrelated to internalizing at T2, low levels of ECBQ sociability were concurrently related to high internalizing scores. In addition, shyness was concurrently related to internalizing at both T2 and T3.

Effortful Control and Orienting/Regulatory Capacity

Low ECBQ and CBQ effortful control, *r*s(186, 187) = −.38, −.55, *p*s < .01, respectively, were linked to T3 externalizing behavior, and a strong concurrent relation between toddler effortful control and externalizing problems was found for the toddler period, $r(244) = -.58$, $p < .01$. Preschool internalizing difficulties were associated with low levels of infant orienting/regulatory capacity, $r(141) = -.18$, $p < .05$, and toddler effortful control, $r(186) = -.26$, $p < .01$, but showed a nonsignificant relation with effortful control in childhood, $r(186) = -.13$, $p < .10$.

No fine-grained aspects of infant orienting/regulatory capacity were significantly related to later behavior problems. As indicated in Table 2, the modest concurrent relationship between internalizing and toddler effortful control was nonspecific, with all toddler effortful control dimensions (except cuddliness) demonstrating low, but significant, negative correlations. In preschool, however, only CBQ attention focusing was associated (negatively) with internalizing. Although low levels of all aspects of ECBQ effortful control were linked to high externalizing scores, the association was particularly strong for inhibitory control. Fisher's Z tests confirmed that the correlations between toddler inhibitory control and toddler externalizing were significantly larger than those between toddler externalizing and low-intensity pleasure, attention shifting, or cuddliness, *p*s < .05, and marginally larger than that for attention focusing, $p < .10$.

At T3, attention focusing and inhibitory control exhibited more substantial correlations with externalizing than did low-intensity pleasure, *p*s < .05, also significantly (negatively) correlated with externalizing. In addition, only toddler inhibitory control and attention focusing were longitudinally associated with T3 externalizing. Finally, consistent with the prediction that effortful control would be more closely related to externalizing than to internalizing problems, *z* tests indicated that all concurrent correlations between T3 externalizing and effortful control temperament scales were significantly larger in magnitude than were their corresponding internalizing-temperament correlations, *p*s < .05.

Regression Analysis

Hierarchical multiple regression was used to assess unique and interactive relations between temperament dimensions and behavior problem factors. We were interested in statistical interactions (i.e., moderation), and thus chose multiple regression for these analyses, rather than *SEM*, due to our limited sample size and substantial disagreement regarding the most appropriate technique to test interactions in *SEM* (Frazier, Tix, & Barron, 2004). Child age and gender as well as family socioeconomic status (SES) were controlled in regression analyses because of previous studies which have indicated that these are likely relevant to the relationships addressed in the context of this study (e.g., Gartstein & Rothbart, 2003; Putnam et al., 2006; Verhulst, 1995).

In each regression, the IBQ-R factor scores and their interactive products, along with child sex and family SES, were entered in a first step, and the ECBQ factors and interactions were entered in a second step. In predicting preschool behavior problems, the CBQ scores and interactions were entered in a third step. The results of these analyses are presented in Table 3.

As expected, negative affectivity in infancy was associated with elevated internalizing scores during toddlerhood and the preschool period. This effect continued to be significant for preschool internalizing problems, even after the ECBQ and CBQ

TABLE 3. *Multiple Regression: Temperament Predicting Toddler and Preschool Behavior Problems*

	Internalizing					Externalizing				
	T2		T3			T2		T3		
Variable	Step 1 β	Step 2 β	Step 1 β	Step 2 β	Step 3 β	Step 1 β	Step 2 β	Step 1 β	Step 2 β	Step 3 β
IBQ-R Sur	−.10	.02	.03	.04	.02	−.07	.01	−.08	−.14	−.13
IBQ-R Neg	.27**	.11	.29**	.18	.17*	.17*	.06	.24**	.12	.09
IBQ-R Orc	.08	.07	−.08	−.04	.01	−.01	.07	.14	.12	.10
IBQ-R Sur*Neg	−.05	−.00	.09	.07	.14	−.02	−.03	.11	.12	.15
IBQ-R Sur*Orc	−.02	−.04	−.02	−.06	−.09	.0	−.01	−.03	−.08	−.07
IBQ-R Neg*Orc	−.05	−.04	−.20*	−.16	−.17	−.06	.01	−.21*	−.16	−.14
ECBQ Sur		−.18**		−.03	.13		.23**		.34**	.16
ECBQ Neg		.36**		.18	−.03		.19**		.22*	.12
ECBQ Eff		−.17*		−.17	−.23*		−.54**		−.24*	−.04
ECBQ Sur*Neg		−.05		.11	.07		−.01		−.06	−.03
ECBQ Sur*Eff		.06		.05	.09		−.04		−.11	−.04
ECBQ Neg*Eff		−.22*		−.14	−.07		−.04		.04	.03
CBQ Sur					−.35**					.15
CBQ Neg					.41**					.33**
CBQ Eff					.03					−.33**
CBQ Sur*Neg					−.03					.00
CBQ Sur*Eff					−.06					.01
CBQ Neg*Eff					−.09					−.19**
df	6,236	12,230	6,133	12,127	18,121	6,236	12,230	6,133	12,127	18,121
F	3.05**	8.22**	3.81**	3.22**	5.35**	1.70	14.98**	2.26*	5.00**	8.36**
R^2	.07	.30	.15	.23	.44	.04	.44	.09	.32	.55

Sur = Surgency; Orc = Orienting/Regulatory Capacity; Eff = Effortful Control.
*$p < .05$. **$p < .01$.

factors had been entered into the equation. At both the toddler and preschool periods, low levels of concurrent surgency were associated with high internalizing scores. Low ECBQ effortful control was related to toddler and preschool internalizing problems, but the association between CBQ effortful control and T2 internalizing scores was reduced to nonsignificance in the regression analyses.

IBQ-R negative affectivity also predicted externalizing at both time points when only IBQ-R factors were included in the regression equation. These effects were nonsignificant, however, when later temperament indicators were added to the model. High levels of ECBQ surgency and low levels of ECBQ effortful control accounted for unique variance in predicting elevated externalizing problems during both toddlerhood and preschool age. The effects of ECBQ negative affectivity, surgency, and effortful control on T3 externalizing problems were no longer statistically significant after the CBQ scores were entered into the equation. As in the results based on simple correlations, high CBQ negative affectivity and low CBQ effortful control were associated with high preschool externalizing difficulties, but CBQ surgency failed to contribute significantly in the final model. Infancy temperament variables explained 5.0% of variance in T2 (toddler) externalizing problems and 7.5% of variance in T2 internalizing problems; 10.4% of T3 (preschool) externalizing variance and 17.2% of T3 internalizing variance (for R^2 associated with toddler and preschool temperament, see Table 3).

To interpret significant interactions between negative affectivity and orienting/regulatory capacity or effortful control in relation to internalizing and externalizing problems, the regression coefficients of negative affectivity upon internalizing scores were inspected at 1 *SD* above and below the mean of the moderating factors, as recommended by Aiken and West (1991). In all cases, negative affectivity was more strongly related to problem behaviors at low levels of orienting/regulatory capacity and effortful control. Toddler negative affectivity was significantly associated with T2 internalizing difficulties at low levels of toddler effortful control, $\beta = .56$, $p < .01$, but not at high levels of effortful control, $\beta = .16$, $p < .10$. Similarly, infant negative affectivity was associated with high T3 internalizing problems at low levels of infant orienting/regulatory capacity, $\beta = .43$, $p < .01$, but not at high levels of orienting/regulatory capacity, $\beta = -.01$, $p > .10$. Preschool negative emotionality was more strongly linked with concurrent internalizing difficulties at low levels of effortful control, $\beta = .64$, $p < .01$, than at high levels of effortful control, $\beta = .26$, $p < .05$. Finally, CBQ negative emotionality was associated with T3 externalizing problems when effortful control was low, $\beta = .62$, $p < .01$, but not when effortful control was high, $\beta = .04$, $p > .10$. Figure 1 graphically represents these relations.

Examination of the significant infant Negative Emotionality × Surgency interaction in predicting T3 internalizing scores suggested that high surgency accentuated the link between negative

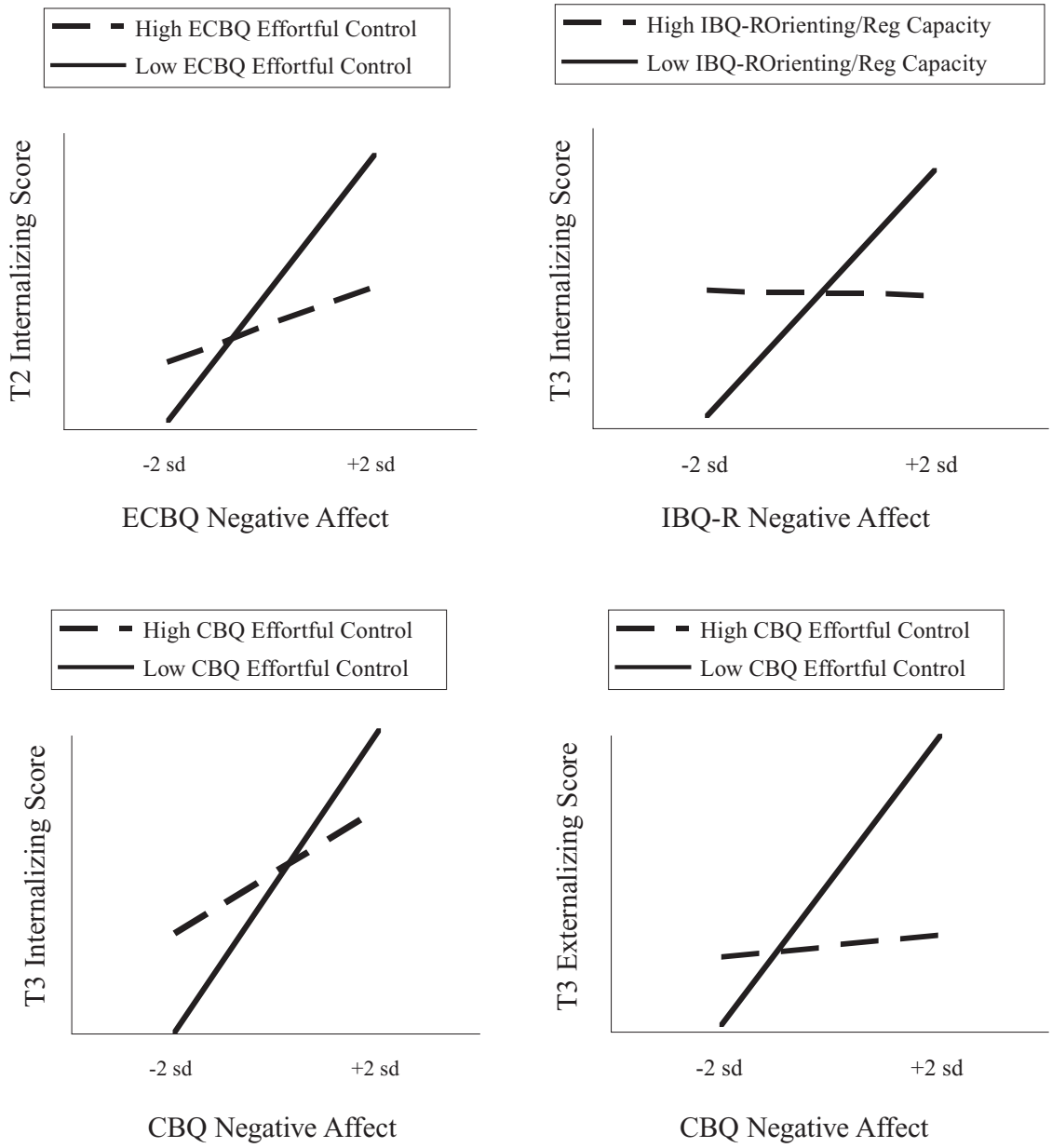

FIGURE 1. Interactions of Negative Affect (NEG) and Orienting/Regulatory Capacity (ORC) or Effortful Control (EFF) in predicting behavior problems.

emotionality and internalizing problems. Preschool negative emotionality was more strongly linked with internalizing difficulties at high levels of infant surgency, $\beta = .46$, $p < .01$, than at low levels of surgency, $\beta = .27$, $p < .01$.

DISCUSSION

Overall, results of this study indicate the value of including both broad and narrow components of temperament in models designed to explain early origins of behavior problems. At the broad factor level, we had predicted that high levels of negative emotionality and low levels of effortful control would be linked to both externalizing and internalizing difficulties, although effortful control was expected to demonstrate a stronger relationship to externalizing problems. We also predicted that elevated surgency would be associated with an increased risk for externalizing behaviors whereas low surgency would increase the likelihood of internalizing problems.

Our hypothesis concerning negative emotionality was confirmed, with temperamental predispositions toward negative affect predicting both internalizing and externalizing behavior problems beginning in infancy, before these behavioral difficulties are typically identified. Note that infant negativity continued to account

for variance in preschool internalizing problems, even after toddler and preschool negative affect and other aspects of temperament were taken into account. The unique contribution of infancy temperament indicators has been documented in predicting preschool-age effortful control and symptoms of depression (Gartstein & Bateman, 2008; Gartstein et al., 2009), after controlling for concurrent temperament ratings. These unique contributions may work to shape later behavior problems through parent–child interaction mechanisms. That is, parents who have difficulties negotiating the challenges of infant negative emotionality may create maladaptive parent–child dynamics for the regulation of distress, which in turn translate into an increased risk for behavior problems (Rothbart, 2011). Future research should more closely examine this and other potential explanatory mechanisms.

At the fine-grained level, we expected that anger would contribute primarily to externalizing whereas fear and sadness would make more substantial contributions to internalizing difficulties. Our results, however, suggest important contributions to internalizing from several additional components of negative emotionality (viz., frustration, sadness, falling reactivity, and discomfort), rather than solely fearfulness (or behavioral inhibition), which has received the most empirical focus in relation to internalizing difficulties (e.g., Biederman et al., 1990; Kagan, Snidman, Zenter, & Peterson, 1999; Schwartz et al., 1999). Eisenberg et al. (2005) reported higher levels of anger and sadness as well as fear among elementary school children with internalizing difficulties, but we are aware of no other studies that have investigated behavior problems in relation to discomfort or falling reactivity.

As expected, given that aggressive and destructive acts are often driven by anger (Eisenberg et al., 2005; Rothbart et al., 1994), anger/frustration played a key role in externalizing problems. Also confirming the findings of Eisenberg et al. (2005), sadness was consistently related to higher externalizing and internalizing problems. Asher, Parkhurst, Hymel, and Williams (1990) suggested that children with externalizing difficulties may frequently experience sadness due to loneliness experienced as a result of rejection by peers. The limited social nexus of toddlers may call this interpretation into question, but an alternative explanation involving comorbidity between internalizing and externalizing behaviors may account for the observed pattern of findings (Rothbart, 2011). The latter explanation appears more plausible, given the correlations observed between internalizing and externalizing problems in this study.

Falling reactivity, a fine-grained temperament component of negative emotionality, also has been linked longitudinally and concurrently to components of effortful control (Putnam et al., 2001; Putnam et al., 2006). Falling reactivity represents children's ability to lower their level of arousal, providing an index of their capacity to change state after a notable level of arousal has been generated. Falling reactivity was implicated in both internalizing and externalizing problems in our results, further supporting the importance of emotion regulation in promoting adaptive development (Calkins & Degnan, 2006; Eisenberg et al., 1996; Stifter, Spinrad, & Braungard-Rieker, 1999). This fine-grained domain of temperament was closely linked to undercontrolled externalizing behavior as well as to symptoms related to depression/anxiety, offering protection at high levels and posing risk when the reported level was relatively low. Thus, falling reactivity appears equally important in shaping each set of behavior problems/symptoms examined in this study.

Analyses addressing components of effortful control indicated that attentional control was largely responsible for the link between effortful control and internalizing problems, presumably because willful modification of attention may allow children to redirect their focus away from distressing stimuli to dampen negative emotions (Eisenberg & Morris, 2002; Lonigan & Phillips, 2001). In contrast, externalizing behaviors were related to all aspects of effortful control during toddlerhood, with inhibitory and attentional control playing particularly strong roles concurrently and longitudinally. The relation of attention focusing to both internalizing and externalizing difficulties was, however, contrary to the Eisenberg and Morris (2002) model linking this component of effortful control primarily to internalizing problems.

Low levels of pleasure to low-intensity stimulation characterized toddlers with internalizing difficulties and children with externalizing behaviors, with the latter group also scoring low on affiliativeness/cuddliness. The importance of considering positivity in sedate activities with parents as separate from more exuberant forms of positive activities was noted by Kochanska, Aksan, Penney, and Doobay (2007), who suggested that they may be early markers of affiliation-related tendencies that could provide protection from dysregulated conduct and associated problems.

As predicted, higher levels of surgency were associated with lower internalizing and higher externalizing difficulties. These findings are consistent with results of studies that have linked positivity-exuberance to externalizing behaviors in toddlers and grade-school children (Putnam & Stifter, 2005; Rydell, Berlin, & Bohlin, 2003) as well as results that have implicated low levels of approach/positive emotionality in the development/maintenance of depression (Lonigan et al., 1994). Thus, higher levels of approach, activity, and extraversion appear to protect against feeling down and worrying while also predisposing youngsters to more difficulties related to "acting-out" behaviors.

Fine-grained components of the surgency factor, including high-intensity pleasure, activity, impulsivity, and positive anticipation, were all associated with preschool-age externalizing problems. Eisenberg and Morris (2002) and Eisenberg et al. (2005) characterized strong surgency components (e.g., impulsivity) as indicative of control deficits, and our results are consistent with the suggestion that children exhibiting more frequent/intense externalizing behaviors are "undercontrolled." Although analyses did not indicate a significant relationship between the overarching surgency factor and internalizing behavior, low sociability was related to high internalizing scores, supporting Fowles' (1994) hypothesis linking internalizing problems to limited activity in the behavioral approach systems. Our findings indicate that children who tend to shy away from social interactions are particularly at risk for internalizing problems, so that a lack of comfort in interactions

with others may lead to anxious and depressive tendencies, as perceived by parents. Conversely, activity level and impulsivity, but not sociability or smiling and laughter, were strong predictors of externalizing difficulties in preschool.

Only a few studies to date have addressed moderating relationships involving different domains of temperament, with the most commonly reported pattern showing that problems associated with high negative emotion appear to be most pronounced among children who also are low in effortful control (for a review, see Rothbart & Bates, 2006). We anticipated replicating these findings in the current investigation, and as expected, benefits of effortful control for adjustment were apparent not only in terms of a direct influence but also through moderation of negative affectivity. A concurrent interaction term (derived via the CBQ negative emotionality and effortful control factors) made a significant contribution to explaining externalizing scores. These results complement a growing body of research which has indicated that externalizing tendencies are most pronounced among children whose temperament profiles includes a combination of high negativity and low effortful control. For internalizing problems, interactions between negative emotionality and regulatory factors accounted for significant amounts of variance with respect to both concurrent and future symptoms.

Although Lonigan and Phillips (2001) theorized that attentional control capabilities might decrease the contribution of temperamental negativity to internalizing difficulties, to our knowledge, the current report is the first to empirically demonstrate the importance of effortful attentional processes in moderating links between negative affect and anxious and depressed reactions in early childhood, and extends the existing literature by demonstrating the importance of infancy orienting/regulatory capacity in moderation of negative emotionality for prediction of internalizing difficulties. Infants who demonstrate a greater capacity for orienting their attention, enjoy cuddling with their caregiver(s), can be readily soothed, and enjoy activities that can be described as reflecting low levels of stimulation (e.g., reading, singing, etc.), appear to be protected against the adverse impact of negative emotion, in terms of later appearing internalizing behavior problems.

Examination of the infant Negative Emotionality × Surgency interaction indicated that higher levels of surgency served to increase the level of risk associated with negative emotionality, leading to higher levels of preschool internalizing problems. Thus, children exhibiting high levels of infant surgency and negative emotionality appeared to be at a particular risk for internalizing-type difficulties (e.g., symptoms of anxiety and/or depression, somatic complaints). These findings are contradictory to those obtained by Dougherty et al. (2010), in which negative emotionality at age 3 years only predicted depression symptoms at age 10 years when positivity was low at follow-up. In contrast to the current study, however, the parent-report measure employed by Dougherty et al. consisted of only the Smiling and Laughter subscale of the CBQ, which tends to load primarily on effortful control in childhood. In contrast, the broader surgency factor appears to represent reactive tendencies to seek out stimulation. It may be that infants who are marked by both a strong drive to approach stimuli and a propensity for negativity are most likely to experience controlling parenting, which has been linked to internalizing problems in the literature (Barber, 1996; Gray & Steinberg, 1999; Soenens et al., 2008). Future research examining the potentially different roles of more intense and sedate aspects of positive emotionality is needed.

The fine-grained dimensions investigated in this study were designed to reflect conceptually distinct aspects of reactivity and regulation, linked with underlying neurobehavioral systems, which provide the foundation for temperament in the psychobiological model (Rothbart, 2011; Rothbart & Derryberry, 1981). Overall, the results obtained provide support for utilizing more differentiated as well as broad temperament measures. Identification of relations between more narrow/specific early appearing temperament attributes and childhood behavior problems is likely to make a significant contribution not only to our understanding of risk and protective factors but also may aid early intervention/prevention efforts by focusing these on a more precisely outlined set of temperament constructs. Future research is needed to determine the feasibility and utility of applying psychobiologically defined temperament dimensions in early intervention/prevention efforts.

A number of limitations relevant to the present study should be noted. First, it is possible that our findings connecting temperament to behavior problems have been impacted to some extent by "contamination" (i.e., conceptual overlap) of measures for the two constructs. It has been argued that relations between temperament and maladjustment may be caused by overlap in item content (Sanson, Prior, & Kyrios, 1990). Recent studies, however, have suggested that links between temperament and behavior problems remain even after "decontamination" of measures (Lemery, Essex, & Smider, 2002; Lengua, West, & Sandler, 1998; Oldehinkel et al., 2004). In addition, in analyses employing the CBQ scales, less than 10% of the CBQ items demonstrated conceptual confounding (Eisenberg et al., 2005; Lemery et al., 2002). Also diminishing concern with this issue is the fact that the infancy temperament indicators were obtained, on average, 17 months prior to the toddler indices of behavior problems and 44 months prior to the childhood measurement.

A second limitation of the current investigation concerns the reliance on parent-report data, and this concern applies to most of the literature linking temperament and behavior problems, with notable exceptions (e.g., Eisenberg et al., 2001; Gilliom & Shaw, 2004; Olson, Sameroff, Kerr, Lopez, & Wellman, 2005). Kagan (1994) contended that parental characteristics including personality, differing knowledge of child behavior, and inconsistent interpretation of items present potential sources of bias in caregiver-report questionnaires. These concerns are at least partially addressed in the IBQ-R, the ECBQ, and the CBQ through use of items that ask only about recently occurring events and inquiring about concrete child behaviors rather than asking parents to make abstract or comparative judgments (Rothbart, 2011; Rothbart & Goldsmith, 1985).

Also easing our concern, interparent agreement has been established for the IBQ-R, the ECBQ, and the CBQ (Gartstein &

Rothbart, 2003; Putnam et al., 2006; Rothbart et al., 2001), and convergence with laboratory measures demonstrated for the IBQ-R (Gartstein & Marmion, 2008; Gartstein et al., 2009; Parades & Leerkes, 2008), the CBQ (Gerardi-Caulton, 2002; Kochanska, Murray, Jacques, Koenig, & Vandergeest, 1996; Schaughency & Fagot, 1993) and the Toddler Behavior Assessment Questionnaire (Goldsmith, 1996) on which the ECBQ was based (Goldsmith & Rothbart, 1991), suggesting a substantial objective component to these parent ratings. Finally, this concern is at least somewhat mitigated by evidence that has shown parent report of child temperament to have superior predictive validity relative to other sources of information addressing child attributes, such as structured observations (Hart, Field, & Roitfarb, 1999; Pauli-Pott, Mertesacker, Bade, Haverkock, & Beckmann, 2003). Regardless, it would be useful to develop observational tasks that address constructs contained in our fine-grained measures not incorporated in existing standardized laboratory batteries (e.g., Buss & Goldsmith, 2000; Goldsmith & Rothbart, 1991).

Our study also is limited in terms of sample characteristics. Although the sample was economically diverse, it reflected the primarily Caucasian population of the Pacific Northwest. In addition, the lack of demographic data for a portion of our sample should be acknowledged as contributing to concerns with regard to the representativeness of those taking part in this research. Subsequent studies of more diverse and/or high-risk populations would be informative, in part because the psychometric properties of temperament scales may be inconsistent across samples differing in ethnicity and SES (e.g., Putnam & Rothbart, 2006). On a related note, our efforts to control for SES-related influences in this study were limited by the unavailability of these data for a subgroup of our participants. Note that results of our study also are best generalized to community-based rather than clinically referred groups because of the nature of the present sample, wherein only a small portion of youngsters obtained scores exceeding the clinical cutoffs for the CBCL internalizing and externalizing scores (T2 Internalizing:1 at borderline levels, 1 above the clinical cutoff; T2 Externalizing: 10 at borderline levels, 2 exceeding the clinical cutoff; T3 Internalizing: 5 borderline, 2 above the clinical cutoff; T3 Externalizing: 10 at borderline levels, 3 exceeding the clinical cutoff). This work is nonetheless important insofar as research on "non-symptomatic precursors of psychopathology is essential for understanding etiological pathways" p. 315 (Gilliom & Shaw, 2004).

In summary, our results support theoretical models and prior empirical work linking temperament and early behavior problems (Frick, 2004; Rothbart & Bates, 2006). In particular, the role of both orienting/regulatory capacity and effortful control as moderators of reactive temperament tendencies should be noted. This work also adds specificity to our understanding of relationships between temperament in infancy and early childhood and subsequent behavior problems. Analyses of fine-grained traits augmented previous research on more narrowly defined aspects of negative emotionality and effortful control, and also generated novel insights about the special role played by surgency-based traits of activity level and impulsivity in the etiology of externalizing problems. This level of specificity may be useful in sharpening the focus of early intervention and prevention efforts targeting young children whose profiles have been linked to specific patterns of risk for future behavior problems. Early identification of children who fit the profile of elevated risk in terms of their temperament would enable services to be directed toward their families prior to escalation of symptoms and/or the onset of problematic parent–child interaction patterns linked with onset of externalizing and internalizing symptoms. These services could include psychoeducation concerning temperament development and related factors as well as "hands-on" advice about parent–child interaction strategies most appropriate and/or effective given particular child temperament profiles (Rothbart, 2011).

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