

Approach and temperamental positive emotionality in toddlerhood predict early childhood behavior problems

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Abstract:

The aim of the study was to examine the moderating role of positive affect on the relation between approach behaviors and adjustment outcomes. One hundred eleven toddlers participated in a laboratory assessment of approach and positive affect at 24 months. Behavior problems were reported by a parent in the fall of the child's kindergarten year. Results supported our hypotheses that children who displayed high approach and high positive affect in both non-threat and low-threat contexts were rated as higher in externalizing behavior problems. On the other hand, for children showing low positive affect, increases in approach in a moderate-threat context lowered the risk of developing internalizing behavior problems. Implications for these findings are discussed, including methodological considerations of differences among eliciting contexts and advantages of separating positive affect and approach.

Keywords: temperament | approach | positive affect | behavior problems

Article:

Introduction

A wealth of empirical research based on models of temperament has examined the influence of children's responses to novelty, specifically approach and withdrawal, on children's developmental trajectories toward behavioral and social adjustment (e.g., Nigg, 2000; Rothbart, Posner, & Hershey, 1995). Historically, these constructs have been considered largely as central

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components of the inhibited and exuberant temperamental styles. Inhibited children, those who show low approach and positive affect and high withdrawal and fear in response to novelty, are at risk for developing social withdrawal and internalizing behaviors (Garcia-Coll, Kagan, & Reznick, 1984; Schwartz, Snidman, & Kagan, 1996) whereas exuberant children show high approach and positive affect when faced with unfamiliarity, and are at risk for developing externalizing behaviors and social aggression (Fox, Henderson, Rubin, Calkins, & Schmidt, 2001; Putnam & Stifter, 2005).

Although it is widely accepted that the risk of developing behavior problems exists for inhibited and exuberant children, the specific mechanisms by which these children develop internalizing and externalizing behaviors are still largely unknown. For example, it is undetermined which aspects of these temperamental styles, affect (i.e., positive and negative) and/or behavior (i.e., approach and withdrawal), put them at risk for psychological and social difficulties. Some research has examined the discrete role of approach/withdrawal and fear (e.g., Garcia-Coll et al., 1984), but very little is understood about the role of positive affect in contexts varying on levels of threat. Further, it is unclear in which contexts the relation between approach and positive affect exist and how this differentially affects the development of behavior problems. Researchers have largely examined approach across novel, threatening episodes that pull for high fear/wariness, and thus, little is understood about approach, and positive affect, in non-threat and low-threat contexts. The current study examined the independent and interactive effects of positive affect and approach across situations varying in threat levels in the development of childhood behavior problems.

Approach and Risk for Behavior Problems

The relation between approach and mental health outcomes has been examined extensively. As an extension of early theory and research on animal models (e.g., Schnierla, 1965), several models exist to identify neural systems believed to describe approach and withdrawal tendencies (e.g., Davidson & Fox, 1982; Gray, 1982). Gray (1982, 1987) proposed that the behavioral approach system (BAS) motivates behavior toward potential rewards whereas the behavioral inhibition system (BIS) motivates avoidance of stimuli involving potential punishment. Thus, individuals with heightened reactivity of the BAS are likely to be quick to approach in response to reward whereas BIS dominance is activated in novel, high-intensity situations that signal potential punishment that inhibit a person's approach. Dominance of the BIS is believed to increase an individual's risk for anxiety disorders (Gray, 1982), and empirical evidence for this relation has been found with children (Caspi, Henry, McGee, Moffitt, & Silva, 1995). On the other hand, strong BAS motivation, including a strong inclination to approach novel and intense stimuli, is related to higher levels of childhood conduct disorder and lower internalizing problems (e.g., Frick & Morris, 2004).

Much of the work on children's approach and withdrawal to novelty, constructs that are similar to BAS/BIS motivations, has been conducted in novel, high-threat contexts, and focused on inhibited and exuberant children (Garcia-Coll et al., 1984; Kagan, Reznick, & Snidman, 1987). However, although not made explicit in most developmental research, the eliciting contexts that pull for approach behaviors vary considerably. Buss (2011) found that the consistency of fear and engagement behaviors across six episodes was low to moderate, indicating that for some

children the context was important in influencing their behaviors. Indeed, the contexts used by researchers to measure specific behaviors and emotions vary in the intensity of threat, type of threat, and incentive properties. Unfortunately, most research on approach/withdrawal has measured approach behavior as a mean across a series of novel, high-intensity situations, and thus, there has not been much attention given to the influence of the eliciting context. Based on animal and human models of approach/withdrawal, approach is engaged in response to low-intensity stimuli (Gray, 1982, 1987; Schnierla, 1965) and high-intensity stimuli (Putnam & Stifter, 2005; Rothbart, 1989); therefore, research is needed to compare approach in threatening/high-intensity *and* non-threat/low-intensity situations to determine if there is a situational difference that alters its role in children's adjustment.

Positive Affect and Risk for Behavior Problems

Although childhood positive affect has been considered extensively as part of temperamental exuberance, there is also some research examining it as an independent construct. A predisposition toward positive emotions is commonly thought to be adaptive and is related to peer competence and prosocial behavior (Denham, McKinley, Couchoud, & Holt, 1990; Eisenberg et al., 1996). Further evidence for the adaptive quality of positive affect comes from work examining it as a protective factor for internalizing behavior problems (Durbin, Klein, Hayden, Buckley, & Moerk, 2005; Shankman et al., 2005). Yet the role of positive affect is not clear as there is additional research linking this construct with maladaptive behaviors. Children who show more intense joy and are faster to show joy score lower on effortful control measures (Kochanska, Murray, & Harlan, 2000). Moreover, laboratory observations of smiling and laughter predict impulsivity and lower inhibitory control (Rothbart, Derryberry, & Posner, 1994).

A possible explanation for the discrepancy among these findings could be the behavior that accompanies children's expression of positive affect. Research has shown that positive affect is related to children's approach behaviors (Putnam & Stifter, 2002; Rothbart, 1988). Positive affect when accompanied by intense, impulsive approach might be related to the development of externalizing behavior problems, as shown by the research with exuberant children (Schwartz et al., 1996; Stifter, Putnam, & Jahromi, 2008), whereas positive affect at moderate to high levels or approach behaviors alone may serve as protective factors in the development of children's behavior problems. On the other hand, there is support for the notion that children low in positive affect are at risk for developing internalizing behavior problems (Durbin et al., 2005); however, the ability to approach in social situations that necessitate engagement may reduce low positive children's risk of developing internalizing behaviors.

Current Study

Using a longitudinal design, the current study examined the moderating role of positive affect on the relation between children's approach behaviors at the age of two, and internalizing and externalizing behaviors in kindergarten. We assessed children's approach and positive affect across a variety of contexts because the situations in which behavior and affect are assessed is important in providing a full understanding of their role in predicting children's adjustment (Buss, 2011; Durbin, 2010). The first goal of the study was to examine approach and positive affect across two types of situations: (1) a series of novel, threatening situations, and (2) a series

of non-threatening situations designed to elicit either neutral or positive affect. As an extension of research showing that in threatening situations, children low in approach and positive affect are at risk for developing internalizing behaviors (Schwartz et al., 1996), we hypothesized that the risk of developing internalizing behaviors would be lowered for children low in positive affect as their levels of approach increased in threatening situations. On the other hand, we hypothesized that children who showed high positive affect and approach in non-threatening contexts would be higher in externalizing behaviors than children high in positive affect and low in approach.

Although much research has examined children's approach behavior across novel, threatening contexts, more recent research has shown that the threat level of the context affects the relation between children's behavior and developmental outcomes (Buss, 2011). Thus, the second goal was to examine children's approach and positive affect in three distinct contexts varying in their levels of threat as predictors of children's behavior problems. We examined approach and positive affect in a high-, moderate-, and low-threat context. The high-threat context has been shown to pull for high fear and low engagement whereas the moderate-threat context elicits moderate fear and low engagement from two-year-old children. The low-threat context has been shown to elicit lower fear and higher engagement than the moderate and high-threat episodes (Buss, 2011).

Because high-threat episodes pull for similar approach/engagement behavior across children (Buss, 2011), we hypothesized that assessment of approach and positive affect in low- and moderate-threat contexts would reveal more meaningful results than examination of these constructs in only high-threat contexts. Specifically, we did not expect positive affect or approach in the high-threat episode to significantly predict children's behavior problems. We hypothesized that children high in positive affect and approach in the low-threat episode would be at risk for developing externalizing behaviors whereas high positive affect would be a protective factor when not accompanied by high approach. Also, we hypothesized that in the moderate-threat context, children low in positive affect and high in approach would be less likely to be rated as showing internalizing behavior problems than children low in positive affect and approach.

Method

Participants

One hundred eleven toddlers (63 males) participated in a longitudinal study of children's socioemotional development. Typically developing toddlers and their families were recruited from published birth announcements. Recruitment letters were sent to 700 families, and 150 of those families were contacted to participate. Primary caregivers and their toddlers came into the laboratory when the toddlers were 24 months old [mean (M) = 24.05; N = 111]. In the fall of the children's kindergarten year, caregivers completed follow-up questionnaires (N = 85). The families were compensated with a monetary payment in the amount of \$25 for the two-year visit and \$10 for completion of the kindergarten questionnaires. This sample was predominantly middle class (M Hollingshead index = 48.84, range 17–66) and non-Hispanic White (90% non-Hispanic White, 3% African American, 3% Hispanic, 3% Asian-American, and 1% Indian

American). Other empirical work using this sample includes Buss (2011), Buss et al. (2013), and Buss, Kiel, Morales, & Robinson (in press).

Procedures

Two-year Protocol

A series of episodes was used to assess fear/wariness and approach. Episodes used in this visit were drawn and modified from the toddler and preschool versions of the laboratory temperament assessment battery (Buss & Goldsmith, 2000; Goldsmith, Reilly, Lemery, Longley, & Prescott, 1994). Caregivers were with their toddlers for all laboratory episodes, although they were instructed to only interact with their toddler if he/she became upset and needed assistance. Central to the current study, toddlers participated in 10 episodes during the laboratory visit; six were designed to be mildly to moderately threatening and four episodes were designed to elicit positive or neutral emotions.

Two moderate-threat episodes involved the toddler interacting with an unfamiliar adult. The *stranger approach* (*SA*) episode began with the caregiver sitting in a chair in the corner of the room and the child playing with a ball, a dump truck, and a Winnie the Pooh doll. After 20 seconds, a male research assistant entered the room, introduced himself to the child, and tried to engage in conversation with the child. Throughout the conversation, the stranger slowly made his way closer to the child, until he sat down approximately 2 ft away from the child. After 1 min, the stranger stood and thanked the child for letting him see the fun toys and left the room. The *stranger working* episode began in the same manner as the *SA* episode, and then an unfamiliar female entered the room and sat in the corner completing paperwork for 2 min. The stranger did not initiate interactions with the toddler, and if the toddler approached the stranger she replied that she was going to work while the toddler played.

The 3-min *clown* episode was designed to be novel yet appealing to the children. The toddler began the episode seated in his/her caregiver's lap before an unfamiliar female assistant entered the room wearing a clown outfit (wig, nose, and no makeup). The clown introduced herself, began pulling out toys (beach ball, bubbles, and musical instruments) from her bag, and periodically asked the toddler to play with her. After the first 2 min, the clown removed her wig and nose. When 3 min had elapsed, the clown asked the toddler to help her clean up the toys and left the room. Similarly, the *puppet show* episode began with the toddler seated in the caregiver's lap about 10 ft away from a puppet theater and lasted for 3 min. The puppets (an elephant and lion) frequently invited the toddler to play catch, go fishing, and take a sticker. The *clown* and *puppet show* episodes are considered to be low in threat.

The final two threat episodes were designed to assess object-related fear and are considered to be high in threat. In both the *spider* and *robot* episodes, the child began seated in the caregiver's lap, across the room from the novel object. In the *robot* episode, after 30 seconds a toy robot (10 in high) began moving, making noises, and lighting up for 1 min. The experimenter entered the room and asked the toddler if he/she would like to touch the robot. In the *spider* episode, a remote-controlled spider moved slowly toward the chair twice. The episode lasted approximately

1 min before the experimenter entered the room and asked the toddler if he/she would like to touch the spider.

Toddlers also participated in a series of episodes that were designed to elicit either neutral or positive affect. The *balls in basket* task was considered to be a joy episode. In *balls in basket*, the toddler and familiar experimenter threw six playground balls into a laundry basket repeatedly for 3 min. In the *free play* episode, the toddler was alone in the room with his/her caregiver and a variety of toys to play with for 3 min. *Snack delay* and *tower of patience* were included to measure toddlers' inhibitory control. In *snack delay*, toddlers were asked to wait varying amounts of time before taking a snack from the experimenter. In *tower of patience*, the experimenter and toddler took turns placing 15 large blocks on top of one another to build a tower.

Measures

Age Two Measures

Each of the episodes were coded separately for positive affect and approach using 5-point Likert scales (1 = no affect/behavior to 5 = display of affect/behavior that lasts the entire episode, or long displays of intense affect/behavior). Positive affect was coded as any positive facial affect or vocalizations. Approach was coded as any attempts of the child to interact with the stimulus, including approaching the stimulus, the child taking the initiative to interact on his/her own, controlling the movement or procedures of the stimulus, and appearing comfortable with the stimulus. Coders were trained by a master coder, practiced by double coding episodes and reached reliability. Each episode was coded by two trained coders, with a total of eight coders across all episodes. For each task, 15–20% of the videos were double coded, and any differences 1 or greater were resolved by a master coder. Intra-class correlations (ICCs) for each behavior in each task were used as the measure of inter-coder reliability. The ICCs ranged from .66 to .80 ($M = .76$) for positive affect across the 10 tasks and .66 to .90 ($M = .83$) for approach across the 10 tasks.

Given the current study's first set of hypotheses regarding positive affect and approach in threat and non-threat situations, four composites were created: an average measure of approach across the six threat episodes (*spider*, *robot*, *SA*, *stranger working*, *clown*, and *puppet show*), an average measure of positive affect across the six threat episodes, an average measure of approach across four non-threat episodes (*snack delay*, *tower of patience*, *balls in basket*, and *free play*), and an average measure of positive affect across the four non-threat episodes (see Tables 1 and 2 for correlations). To address the study's second set of hypotheses, measures of approach and positive affect were assessed in three situations varying in their levels of threat: *spider*, *clown*, and *SA*. Although all episodes are novel and social in nature and designed to elicit fear and withdrawal behavior, a method that is widely used in assessing children's approach and withdrawal (e.g., Kagan, Reznick, Clarke, Snidman, & Garcia-Coll, 1984), existing research has shown that these episodes elicit varying levels of engagement and fear from children. Specifically, the *spider* task (high threat) has been shown to pull for high fear and low engagement whereas the *SA* task (moderate threat) has been shown to elicit moderate levels of fear and low levels of engagement from two-year-old children. The *clown* task (low threat) has been shown to elicit lower fear and

higher engagement and positive affect than the moderate- and high-threat episodes (Buss, 2011). Therefore, there were three measures of approach behavior and three measures of positive affect used to address the second aim: *clown* approach, *SA* approach, *spider* approach, *clown* positive affect, *SA* positive affect, and *spider* positive affect.

Table 1. Bivariate Correlations Between Approach and Positive Affect in the Non-threat Episodes

	1	2	3	4	5	6	7	8
1. Free play approach	—							
2. Tower approach	.18*	—						
3. Balls/basket approach	.34***	.33***	—					
4. Snack delay approach	.16 ⁺	.27***	.27**	—				
5. Free play PA					—			
6. Tower PA					.32***	—		
7. Balls/basket PA					.30**	.17****	—	
8. Snack delay PA					.15	.31***	.13	—

Note : PA = Positive affect.

⁺ $p < .10$, *** $p < .001$, ** $p < .01$, * $p < .05$.

Caregivers also completed a series of questionnaires, including the infant toddler social and emotional assessment (ITSEA; Carter, Briggs-Gowan, Jones, & Little, 2003). The ITSEA is a 166-item questionnaire assessing children's normal feelings and behaviors, as well as adjustment problems. Items are rated on a 3-point scale (0 = not true or rarely true; 1 = somewhat or sometimes true; 2 = very true or often true). The current study used the internalizing and externalizing scales as control variables in the analyses with kindergarten internalizing and externalizing behavior problems as the dependent variable, respectively. The internalizing composite includes 30 items from scales measuring children's inhibition to novelty (five items), general anxiety (10 items), separation anxiety (six items), and depression/withdrawal (nine items). The externalizing composite includes 24 items across scales assessing aggression/defiance (12 items), activity/impulsivity (six items), and peer aggression (six items). In the current sample, the internalizing alpha was $\alpha = .79$, and the externalizing alpha was $\alpha = .70$.

Fall Kindergarten Assessment

At the kindergarten assessment, caregivers completed the MacArthur health behavior questionnaire (HBQ; Armstrong & Goldstein, 2003; Essex et al., 2002), which is a 172-item questionnaire measuring mental and physical health, and social and academic competence. Items are rated on a 3-point scale (0 = rarely applies; 1 = somewhat applies; or 2 = certainly applies). The internalizing and externalizing scales were examined for the current study. The internalizing scale consists of 29 items, including subscales of depression (seven items; e.g., 'cries a lot'), overanxious (12 items; e.g., 'worries about things in the future'), and separation anxiety (10 items; e.g., 'worries about being separated from loved ones'). The externalizing scale consists of 46 items, including subscales of oppositional defiant (9 items; e.g., 'has temper tantrums or a hot temper' and 'defiant, talks back to adults'), conduct problems (12 items; e.g., 'physically attacks people' and 'disobedient at school'), overt hostility (four items; e.g., 'taunts and teases other children'), relational aggression (six items; e.g., 'tries to get others to dislike a peer'), inattention

(six items; e.g., 'distractible, has difficulty sticking to any activity'), and impulsivity (nine items; e.g., 'impulsive or acts without thinking'). For the current sample, the internalizing alpha was $\alpha = .81$, and the externalizing alpha was $\alpha = .94$.

Analysis of Attrition and Missing Data

It is increasingly acknowledged that using listwise deletion to exclude participants who do not have complete longitudinal data may unnecessarily limit power and potentially bias parameter estimates (Howell, 2007; Widaman, 2006). We chose to impute missing data for positive affect, approach, and kindergarten problem behaviors. We compared all age two study variables for families who completed all study assessments with those who failed to complete the kindergarten visit and found no significant differences. Additionally, the Little's MCAR test was non-significant, $X^2 = 45.219$, degrees of freedom = 34, $p = .10$, suggesting that missing data were likely missing completely at random. Therefore, following current recommendations in the literature for longitudinal data (Howell, 2007), we used multiple imputation for the missing data using the expectation/maximization likelihood treatment of missing data (i.e., the EM algorithm). For the multiple imputations, 10 datasets were generated, and the results were combined using a mean composite for each variable.

Results

Descriptive statistics and bivariate correlations among study variables can be found in Table 3. No gender differences were found in positive affect, approach behaviors, and problem behaviors, $t s < 1.59$, $p s > .10$. Gender was not examined further. Using published cutoffs for borderline to clinical range scores on the HBQ, we calculated the percentage of children meeting this criterion. Internalizing dimension cutoffs were observed in 8.1% of children at kindergarten. Externalizing dimension cutoffs were observed in 11.9% of children at kindergarten.

The goals of the current study were to examine longitudinally the interactive effects of children's positive affect and approach behaviors in multiple situations in predicting children's internalizing and externalizing behavior problems. To address these goals, multiple regression analyses were performed to examine the interactive effects of approach and positive affect on kindergarten internalizing and externalizing behaviors. To avoid multicollinearity, predictor variables were centered and then multiplied to create interaction terms. In the models examining internalizing and externalizing behaviors as the dependent variables, parent reports of children's internalizing/externalizing behavior problems at the age of two and internalizing/externalizing behaviors at kindergarten were entered as the first step into the model as control variables. For example, in the analyses examining externalizing behaviors as the dependent variable, age two externalizing and kindergarten internalizing behaviors were entered into the model as control variables. This was done because of our interest in children's change in behavior problems from toddlerhood to kindergarten, and the significant correlation between internalizing and externalizing behaviors at kindergarten. In the second step, children's approach and positive affect were entered, followed by the two-way interaction between positive affect and approach in the third step. Central to the aims of the current study, four models were run to examine mean approach and positive affect across the threat episodes and non-threat episodes in predicting internalizing and externalizing behaviors. In addition, two models were conducted to examine

approach and positive affect in the *clown* episode (low threat), two models were conducted to examine approach and positive affect in the *SA* episode (moderate threat), and two models were conducted to examine approach and positive affect in the *spider* episode (high threat) in predicting internalizing and externalizing behaviors. Follow-up tests of significant interactions were probed such that relations between approach and internalizing and externalizing were examined at low [-1 standard deviation (*SD*)], mean, and high ($+1$ *SD*) levels of positive affect (Aiken & West, 1991). All regression models with significant results are presented in Table 4.

Positive Affect and Approach in the Threat Episodes

Internalizing Behavior Problems

A main effect was revealed for positive affect in predicting children's internalizing problems, $\beta = -.31, p < .05$. This effect was subsumed by a significant interaction between positive affect and approach, $\beta = .40, p < .05$. Follow-up analyses revealed that at low positive affect the relation between approach and internalizing was significant, $\beta = .25, p < .01$. As approach behaviors increased, children who showed low positive affect were less likely to be rated as having increased internalizing behavior problems from toddlerhood to kindergarten (Figure 1). This relation was non-significant at high levels of positive affect.

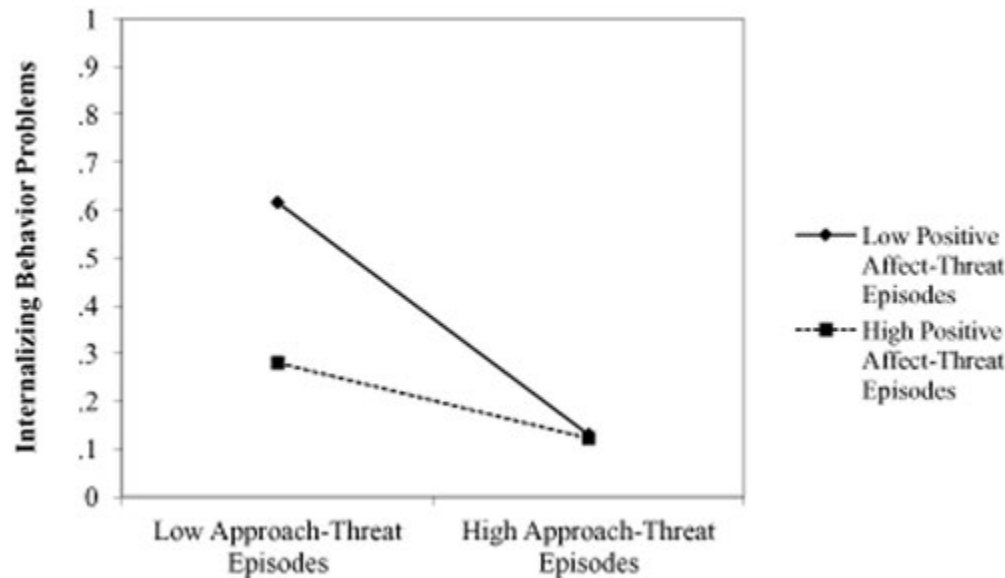


Figure 1. Interaction of Positive Affect and Approach Across the Threat Episodes Predicting Parent-reported Kindergarten Internalizing Behavior Problems.

Externalizing Behavior Problems

There were no significant effects in the regression model examining the moderating role of threat episode positive affect on the relation between threat episode approach and kindergarten externalizing behaviors.

Table 2. Bivariate Correlations Between Approach and Positive Affect in the Threat Episodes

	1	2	3	4	5	6	7	8	9	10	11	12
1. Spider approach	—											
2. Robot approach	.51***	—										
3. SA approach	.10	.02	—									
4. Stranger working approach	.07	.01	.42***	—								
5. Clown approach	.31**	.23*	.38***	.23*	—							
6. Puppet show approach	.32**	.26**	.23*	.26**	.41***	—						
7. Spider PA							—					
8. Robot PA							.38***	—				
9. SA PA							.27**	.19*	—			
10. Stranger working PA							.07	.25*	.33***	—		
11. Clown PA							.24*	.22*	.42***	.30**	—	
12. Puppet show PA							.25**	.09	.20*	.18****	.40***	—

Note : PA = Positive affect; SA = stranger approach.

**** $p < .10$, *** $p < .001$, ** $p < .01$, * $p < .05$.

Table 3. Descriptive Statistics and Bivariate Correlations Among Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Threat approach	—													
2. Threat PA	.52***	—												
3. Non-threat approach	.35*	.31**	—											
4. Non-threat PA	.07	.44***	.49***	—										
5. Clown approach	.70***	.28**	.19*	-.02	—									
6. Clown PA	.43***	.69***	.13	.25**	.53***	—								
7. SA approach	.57***	.30**	.23*	.07	.38**	.29**	—							
8. SA PA	.37***	.63***	.10	.18	.31**	.42**	.46***	—						
9. Spider approach	.62***	.34***	.29**	.05	.31**	.18	.09	.27**	—					
10. Spider PA	.24**	.52***	.18	.20*	.04	.24*	.08	.27**	.41***	—				
11. Two-year externalizing	.28**	.16	.10	.04	.27**	.23*	.06	.10	.03	-.09	—			
12. Two-year internalizing	.00	-.01	.11	.04	-.03	.02	.00	-.07	-.06	-.09	.25**	—		
13. Kindergarten externalizing	-.04	.03	.01	.09	.11	.06	-.08	.08	-.05	.03	.02	.04	—	
14. Kindergarten internalizing	-.06	-.24**	-.16****	-.30**	.12	-.13	-.12	-.14	-.13	-.17****	-.02	.15	.53***	—
Mean	2.52	2.30	3.03	2.56	2.79	2.56	2.68	1.78	2.26	2.01	.44	.41	.46	.30
SD	.67	.56	.54	.65	1.08	.98	1.04	.98	.99	.95	.23	.19	.26	.17

Note : PA = Positive affect; SA = stranger approach; SD = standard deviation.

**** $p < .10$, *** $p < .001$, ** $p < .01$, * $p < .05$.

Table 4. Multiple Regression Analyses

	<i>B</i>	<i>SE (B)</i>	β	ΔR^2
Threat episodes				
Outcome: internalizing				
Step 1				.28***
Two-year internalizing	.10	.04	.11	
Kindergarten externalizing	.34	.06	.52***	
Step 2				.08**
Two-year internalizing	.10	.08	.11	
Kindergarten externalizing	.35	.06	.53***	
Threat approach	.03	.03	.12	
Threat PA	-.10	.03	-.31**	
Step 3				.04*
Two-year internalizing	.09	.08	.09	
Kindergarten externalizing	.34	.05	.51***	
Threat approach	-.04	.08	-.16	
Threat PA	-.10	.03	-.31*	
Threat approach \times threat PA	.06	.04	.40*	
Non-threat episodes				
Outcome: externalizing				
Step 1				.28***
Two-year externalizing	.02	.10	.02	
Kindergarten internalizing	.78	.13	.52***	
Step 2				.03
Two-year externalizing	.02	.09	.02	
Kindergarten internalizing	.85	.13	.57***	
Non-threat approach	.00	.04	-.06	
Non-threat PA	.09	.05	.18****	
Step 3				.03
Two-year externalizing	.01	.10	.01	
Kindergarten internalizing	.84	.14	.55***	
Non-threat approach	-.01	.04	-.01	
Non-threat PA	.08	.05	.18****	
Non-threat approach \times PA	.09	.04	.24*	
Stranger approach (moderate threat)				
Outcome: internalizing				
Step 1				.28***
Two-year internalizing	.09	.08	.10	
Kindergarten externalizing	.33	.06	.51***	
Step 2				.05*
Two-year internalizing	.08	.08	.09	
Kindergarten externalizing	.34	.06	.51***	
SA approach	.00	.02	.00	
SA PA	-.04	.02	-.21*	
Step 3				.04*
Two-year internalizing	.10	.08	.12	
Kindergarten externalizing	.33	.06	.51***	
SA approach	.01	.02	.30	
SA PA	-.07	.02	-.38*	

	<i>B</i>	<i>SE (B)</i>	β	ΔR^2
SA approach \times SA PA	.04	.01	.26*	
Clown (low threat)				
Outcome: internalizing				
Step 1				.27***
Two-year internalizing	.09	.08	.10	
Kindergarten externalizing	.33	.06	.51***	
Step 2				.05*
Two-year internalizing	.10	.08	.11	
Kindergarten externalizing	.33	.06	.51***	
Clown approach	.04	.02	.23*	
Clown PA	-.05	.02	-.27**	
Step 3				.01
Two-year internalizing	.10	.08	.11	
Kindergarten externalizing	.31	.06	.48***	
Clown approach	.04	.02	.24*	
Clown PA	-.05	.02	-.27**	
Clown approach \times clown PA	.02	.02	.09	
Outcome: externalizing				
Step 1				.26***
Two-year externalizing	.02	.10	.02	
Kindergarten internalizing	.78	.14	.51***	
Step 2				.02
Two-year externalizing	.00	.10	.00	
Kindergarten internalizing	.81	.14	.53***	
Clown approach	-.01	.03	-.06	
Clown PA	.05	.03	.16	
Step 3				.03*
Two-year externalizing	.00	.10	.00	
Kindergarten internalizing	.75	.14	.49***	
Clown approach	.01	.03	-.04	
Clown PA	.04	.03	.15	
Clown approach \times clown PA	.05	.02	.20*	

Note : PA = Positive affect; SA = stranger approach; SE = standard error.

*** $p < .10$, ** $p < .001$, * $p < .01$, $p < .05$.

Positive Affect and Approach in the Non-threat Episodes

Internalizing Behavior Problems

There were no significant effects in the regression model examining the moderating role of non-threat episode positive affect on the relation between non-threat episode approach and kindergarten internalizing behaviors.

Externalizing Behavior Problems

A significant approach \times positive affect interaction term was revealed, $\beta = .24$, $p < .05$, and follow-up analyses indicated that this relation was significant at high levels of positive affect, $\beta = .30$, $p < .05$. Children high in positive affect in the non-threat episodes who showed high levels

of approach were more likely to show significant increases in externalizing behaviors from toddlerhood to kindergarten than children who showed low levels of approach (Figure 2).

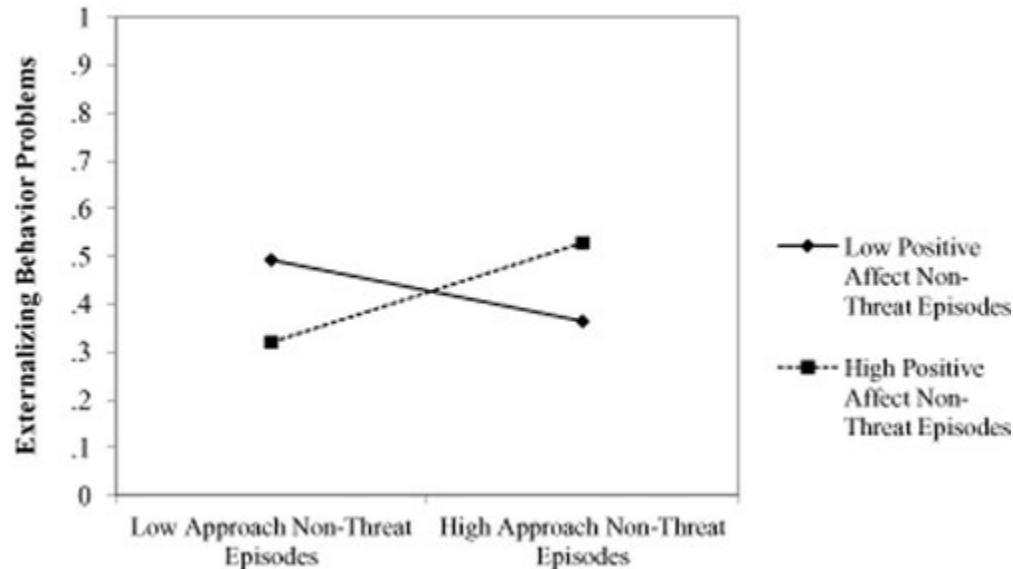


Figure 2. Interaction of Positive Affect and Approach Across the Non-threat Episodes Predicting Parent-reported Kindergarten Externalizing Behavior Problems.

Positive Affect and Approach in the *Spider* Episode (High Threat)

Internalizing Behavior Problems

There were no significant effects in the regression model run to examine the moderating role of *spider* episode positive affect on the relation between approach and kindergarten internalizing behaviors.

Externalizing Behavior Problems

There were no significant effects in the regression model run to examine the moderating role of *spider* episode positive affect on the relation between approach and kindergarten externalizing behaviors.

Positive Affect and Approach in the *SA* Episode (Moderate Threat)

Internalizing Behavior Problems

The regression analysis testing the moderating effects of *SA* positive affect on the relation between *SA* approach and internalizing behaviors revealed a significant main effect for positive affect, $\beta = -.38, p < .05$. This main effect was subsumed under a significant interaction for positive affect and approach in *SA* episode ($\beta = .26, p < .05$). At low levels of positive affect, there was a significant relation between *SA* approach and internalizing behavior problems in kindergarten, $\beta = -.29, p < .05$. As approach increased, children who showed low positive affect

were less likely to show increased levels of internalizing behaviors from toddlerhood to kindergarten (Figure 3). This relation was not significant at high levels of positive affect.

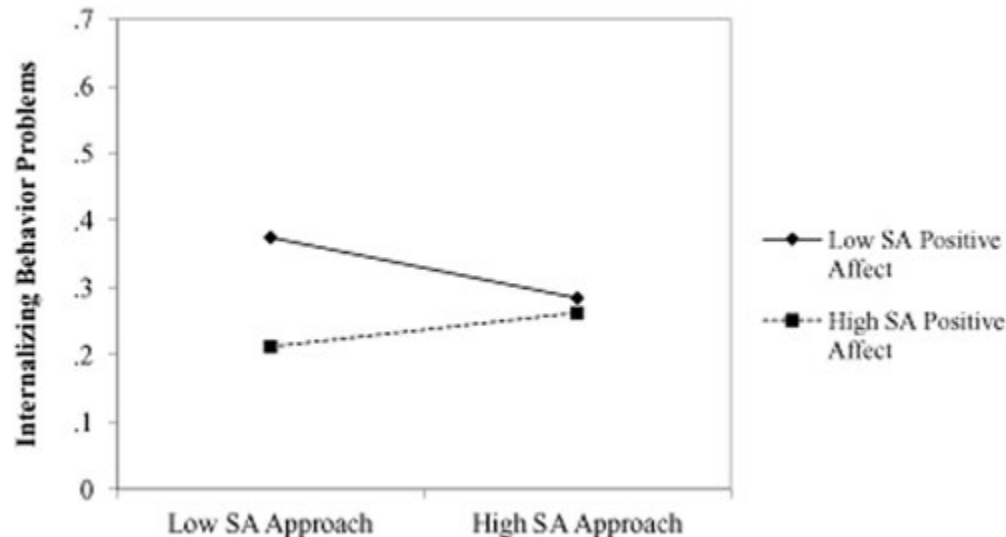


Figure 3. Interaction of Positive Affect and Approach in the *Stranger Approach* (SA) Episode Predicting Parent-reported Kindergarten Internalizing Behavior Problems.

Externalizing Behavior Problems

There were no significant effects in the regression model run to examine the moderating role of SA positive affect on the relation between approach and kindergarten internalizing behaviors.

Positive Affect and Approach in the *Clown* Episode (Low Threat)

Internalizing Behavior Problems

Main effects were revealed for positive affect ($\beta = -.27, p < .01$) and approach ($\beta = .24, p < .05$) in predicting children's internalizing behaviors. Children high in positive affect were less likely to show significant increases in internalizing behaviors from the age of two to kindergarten and children high in approach were more likely to show increases in internalizing behaviors.

Externalizing Behavior Problems

The results revealed a significant interaction effect for *clown* positive affect and approach, $\beta = .20, p < .05$. At low levels of *clown* positive affect, the relation between *clown* approach and externalizing was not significant. At high levels of positive affect, this relation was significant (Figure 4; $\beta = .49, p < .01$). Children high in *clown* positive affect and approach were more likely to show significant increases in externalizing behavior problems from toddlerhood to kindergarten than children low in approach.

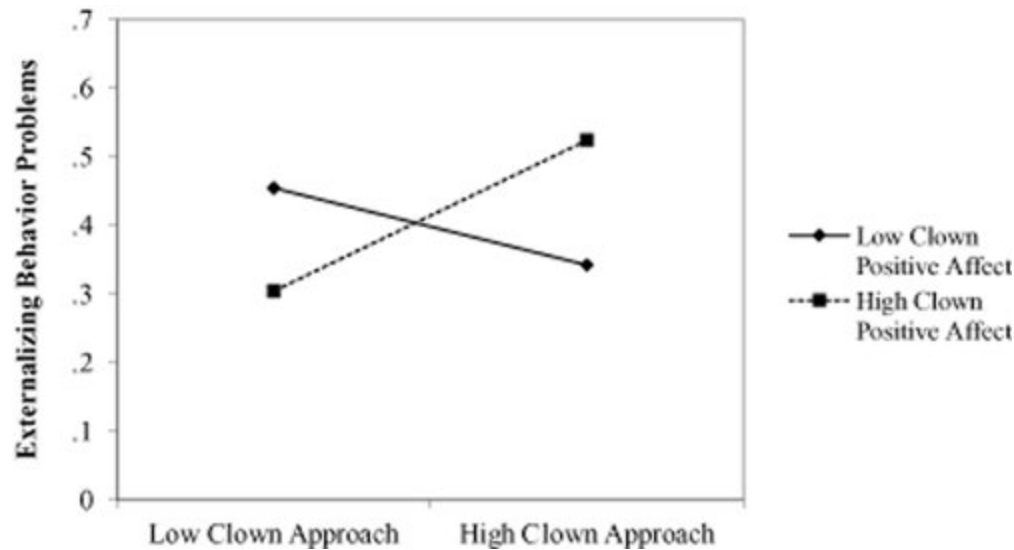


Figure 4. Interaction of Positive Affect and Approach in the *Clown* Episode Predicting Parent-reported Kindergarten Externalizing Behavior Problems.

Discussion

Although extensive research has shown the relation between approach and social and psychological adjustment (e.g., Nigg, 2000; Rothbart et al., 1995), the specific mechanisms by which individual differences in approach develop into internalizing and externalizing behaviors are still largely unknown. Research has focused largely on the temperamental styles of inhibited and exuberant children; however, it is still undetermined which aspects of these temperamental styles, affect (i.e., positive and negative) and/or behavior (i.e., approach and withdrawal), put them at risk for maladjustment. The goal of the current study was to examine positive affect and approach as separate constructs across situations varying in their threat level in the development of childhood behavior problems. We hypothesized that the relation between approach and the development of internalizing and externalizing behaviors would depend on the child's level of positive affect. Further, we hypothesized that the role of approach and positive affect in the development of internalizing behaviors, externalizing behaviors, or neither would depend on the context in which the behavior/emotion occurred. Although researchers have started to identify the role of context in affecting variability in children's approach behaviors (Buss, 2011), research has largely measured approach across a series of novel, high-intensity situations. Thus, we sought to determine if there is a situational difference (across and within situations that pose no threat, low, moderate, and high threat) that alters the role of approach in children's adjustment.

The first goal of the current study was to examine the role of approach and positive affect across threatening, novel contexts and across non-threat contexts designed to elicit positive and neutral affect. As hypothesized, children who showed low approach and low positive affect across the threatening contexts were more likely to show increases in internalizing behaviors from toddlerhood to kindergarten than children high in approach and low in positive affect. This finding replicates existing research showing that children low in both approach and positive affect across a variety of threatening, novel situations are at risk for developing internalizing behavior problems (e.g., Garcia-Coll et al., 1984). It is commonly hypothesized that these

children avoid situations that heighten their fear, such as many of the threatening contexts used in the current study.

On the other hand, very little research has examined the independent and interactive roles of approach and positive affect in non-threatening contexts, even though approach is engaged in response to both low-intensity stimuli (Gray, 1982, 1987; Schnierla, 1965) and high-intensity stimuli (Putnam & Stifter, 2005; Rothbart, 1989). As hypothesized, in non-threat situations where little stimulation is provided and it is a relatively calm environment, children who were high in impulsive, intense approach and also showed excitement/high positive affect developed significantly more externalizing behavior problems from toddlerhood to kindergarten than children who were lower in approach, but still showed high positive affect. There is some limited research showing the role of positive affect in low-intensity situations as predicting later externalizing behaviors (Putnam & Stifter, 2005), but this is the first known study to show the interactive effect between approach and positive affect in non-threatening contexts.

The second goal of the current study was to investigate children's approach and positive affect in distinct threat contexts (high, moderate, and low threat) as predictors of children's later behavior problems. Approach and positive affect in contexts other than highly novel, threat contexts is of great interest in identifying which children are at risk for developing internalizing and externalizing behavior problems. Supporting our hypotheses, we found significant results in the low- and moderate-threat contexts, but not the high threat context. This substantiates the notion to examine context-specific behaviors because it is normative for children to show low approach and positive affect in extremely high-threat contexts. Thus, because high-threat episodes pull for similar approach/engagement behavior across children (Buss, 2011), examination of positive affect and approach in moderate- and low-threat contexts provides more meaningful results than examination of these constructs in the high-threat context.

The role of positive affect and approach in a moderately threatening context significantly predicted kindergarten internalizing behaviors. Children low in positive affect and approach behaviors in this widely used threatening situation (*SA*) were more likely to show increases in internalizing behavior problems from toddlerhood to kindergarten than children low in positive affect and high in approach. The findings from this investigation suggest that the combination of *both* low approach and a lack of positive affect in a moderate-threat situation put children at the greatest risk for being rated as high in internalizing behaviors. But for children who showed lower positive affect, increases in their ability to engage with the unfamiliar, potentially threatening stimulus lowered the risk of showing increases in internalizing behavior from the age of two to kindergarten. Unfortunately, what is unclear from these findings is if children low in positive affect who are also low in approach motivation are simply less interested in engaging in the situation, or if they have conflicted motivation where they desire to engage with the stranger but do not do so because of their high levels of fear. In order to answer this question, future research should replicate the current study while also examining negative affect and especially fear.

The present investigation also found interactive effects in the low threat context. Specifically, we found that for children high in positive affect, as their level of approach increased in the low-threat episode (*clown*), there was an escalated likelihood that they showed increases in

externalizing behavior problems from the age of two to kindergarten. By examining these constructs as separate entities, this study suggests that children high in approach behaviors *or* positive affect alone are not at risk for externalizing behavior problems; instead, high positive affect appears to exacerbate the effects of approach behaviors in the development of externalizing behavior problems. This finding adds to the mounting research that children high in approach behaviors *and* positive affect are at risk for developing externalizing difficulties later in childhood (e.g., Stifter et al., 2008). However, this is one of the first known studies to also address that this relation exists in both non-threat and low-threat contexts because existing research has largely focused across high-threat contexts.

Recent research has strived to understand the mechanisms by which children high in both approach behaviors and positive affect are at risk for developing psychological and social difficulties (Dollar & Stifter, 2012; Gunnar, Sebanc, Tout, Donzella, & van Dulmen, 2003; Stifter et al., 2008). Much of this research has focused on the role of children's negative emotions, particularly anger, because anger motivates goal-oriented behavior and functions to assist an individual to overcome obstacles in order to obtain their goal and gain rewards (Cole, Michel, & Teti, 1994). This research explains why children high in approach motivation and positive affect, those who are especially reward oriented, are at an escalated risk of developing externalizing behaviors. Notably, the current study's results add to the argument that although a predisposition toward positive emotions is typically believed to be a favorable quality in children, a child's inability to regulate their high approach, vigorous behavior when excited might represent a liability to the child (Polak-Toste & Gunnar, 2006). On the other hand, the use of positive affect, when not accompanied by high-approach behaviors may be protective against developing externalizing behavior as their positive disposition may offset their inclination toward anger (Fredrickson, 2001).

Although the current study did not directly measure emotion regulation, there are important implications from these findings regarding the significance of children's emotion regulation. A central hypothesis in the developmental literature proposes that when children high in approach are able to regulate their emotions and behaviors, they are more likely to have adaptive outcomes; but when poorly regulated, these children are more likely to exhibit behavior problems and peer rejection (Gunnar et al., 2003; Stifter et al., 2008). In particular, research has recently focused on the importance of anger regulation for children high in approach and positive affect (Dollar & Stifter, 2012). Results from this study suggest that in addition to their ability to regulate anger, it could be important for these children to achieve the ability to regulate their impulsive, high-approach behaviors, while maintaining their expression and experience of positive emotions. It is also possible that both high and low levels of positive affect are maladaptive for children whereas moderate levels of positive affect might be ideal; thus, future research is warranted to establish if in certain situations, children need to be able to down-regulate intense positive emotions or up-regulate positive emotions. Related to this idea of emotion and behavior regulation, it might be important for children to learn in which situations it is appropriate to allow excited, impulsive approach, as opposed to situations in which this type of emotion and behavior should be regulated. On the other hand, according to this study if low positive children are able to 'up-regulate' their approach behaviors in uncomfortable social situations, such as when a stranger approaches them, they are less likely to develop behavior problems of the internalizing type. This suggests that it is just as important for these children to

learn to become engaged in their environment, even if it is overwhelming for them at first, as it is for them to learn to regulate positive or negative emotions. As this is the first known study to find this relation, additional research is needed to provide further support.

Although the current study greatly adds to existing literature, there are several noteworthy limitations. First, caution should be exercised in interpreting the parent-reported outcome measure used within the current investigation. Parents might show bias in rating their children's characteristics (Kagan, 1998), and these measures are screening instruments, not clinical assessments, used to identify behaviors that may put children at risk for problem behaviors. Secondly, the generalizability of the current study's findings are limited to low-risk samples as the participants were predominantly white, middle-class families. In addition, a couple of our measures had relatively low reliability statistics, and thus, the results should be interpreted with caution. Finally, future research should examine the role of toddler negative emotions (e.g., fear) and withdrawal behaviors, in addition to positive emotions and approach, as predictors of children's developmental trajectories.

The findings from the current study suggest that it is important to consider the constructs of positive affect and approach as separate entities in the development of internalizing and externalizing behavior problems. Further, this study adds to the growing literature underscoring the need to consider the context in which behavior and affect is expressed when assessing their developmental role toward children's social and psychological adjustment. These findings suggest that children high in approach, especially in non-threatening and low-threat contexts, coupled with high positive affect are prone to developing behavior problems and need to learn to regulate their emotions and/or approach behaviors to lower their risk for maladaptive trajectories. On the other hand, children low in positive affect might benefit from learning to up-regulate their approach behaviors in social situations that pull for them to withdraw in order to protect them from developing internalizing behavior problems. Thus, this study adds to the growing literature to assist in the early identification of which children are at risk for developing behavior problems, both in the internalizing and externalizing realms.

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