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Low Positive Affectivity and Behavioral Inhibition in Preschool-Age Children: A Replication and Extension of Previous Findings

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Abstract

The present report replicates and extends our previous study using a laboratory assessment of child temperament and behavior to distinguish the affective component, low positive affect (PA), of the broader positive emotionality construct from behavioral inhibition (BI) in a larger, independent sample. Additionally, we examined whether laboratory-assessed traits could be distinguished on parent/teacher reports of related constructs. Low positive emotionality and BI share the core feature of low approach/engagement and are often not distinguished in the literature, despite presumed differences in underlying motivation. We examined these traits in novel and non-novel laboratory contexts. Similar to previous findings, we found that in novel situations, children with low PA and children with high BI exhibited similar levels of approach, and both groups exhibited lower approach than controls. In contrast, in non-novel situations, children with low PA exhibited significantly lower levels of approach than children with high BI and controls. Finally, we also found external evidence for the distinction between laboratory-defined low PA and high BI on parent and teacher reports of child temperament.

Keywords

positive affect; behavioral inhibition; temperament; children

Temperament has been defined as biologically-based individual differences in reactivity and regulation that are relatively stable over time and shape the way individuals adapt (Clark & Watson, 1999; Rothbart & Bates, 2006). Research has focused on the broad constructs of positive emotionality (PE) and negative emotionality (NE) (Clark & Watson, 1999; Rothbart & Bates, 2006) as well as behavioral inhibition (BI) (Fox et al., 2005; Kagan, 1997). Although these constructs have distinct features, they share behavioral traits that create difficulties in distinguishing between them. Specifically, low PE and high BI share the feature of low behavioral approach (Durbin, Klein, Hayden, Buckley, & Moerk, 2005; Pfeifer, Goldsmith, Davidson, & Rickman, 2002).

PE encompasses positive mood states, sociability, and engagement with the environment (Clark & Watson, 1999). For this paper, we use PE to refer to the temperament construct of positive emotionality, and we use “positive affect (PA)” to refer specifically to the affective

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component of the broader PE construct. Thus, children with low PE exhibit low levels of PA, social interactions, and appetitive behavior. BI includes high negative affect (especially fear), low approach, and high constraint (Kagan, 1997). Children with high BI are wary, hesitant, and fearful in unfamiliar contexts and with unfamiliar people. Both constructs share low approach as a core feature but are presumed to differ in the underlying motivation and eliciting contexts. In low PE, low approach reflects chronically low levels of motivation to engage. In BI, low approach is presumed to reflect conflicted motivation, such that children desire to engage but are blocked by anxiety/fear. Hence, low approach in behaviorally inhibited children should be limited to unfamiliar situations that generate a sense of novelty and threat.

Differentiation of Temperament Traits

Two recent studies have examined this distinction. Putnam and Stifter (2005) examined approach versus inhibition, positive affect, and negative affect in 126 toddlers in both high intensity (i.e. high novelty/threat) and low intensity situations. They reported that both positive and negative affect were significantly but differentially associated with approach in high intensity situations whereas positive affect was more strongly associated with approach in low intensity situations. In a sample of 100 preschoolers, Laptook et al. (2008) used laboratory measures to differentiate the low positive affective component of the broader PE construct and high BI. Results indicated that both traits were associated with low approach in novel contexts but only low PA was distinguished by low approach in non-novel situations.

Unfortunately, low PE and BI are not always distinguished methodologically or conceptually. Laboratory observation measures of BI frequently include markers of PA, such as smiling and laughter (e.g., Gest, 1997; Kagan, Snidman, & Arcus, 1998). Many studies have also conceptualized BI and PE as opposite ends of a single dimension, defined by high BI at one end and high PE/exuberance at the other (Polak-Toste & Gunnar, 2006). However, BI and PE have been empirically differentiated in studies using laboratory observations of young children, with correlations between the two ranging from -.09 (Pfeifer et al., 2002) to -.28 (Durbin et al., 2005).

Failure to distinguish these traits complicates the interpretation of findings and exploration of their possible differential trajectories. For example, BI and PE may have different influences on the development of psychopathology, such that low PE may be a specific precursor/predisposing factor for depression (Clark & Watson, 1999), whereas BI may be an early temperamental precursor of later anxiety (Hirshfeld-Becker et al., 2008; Fox et al., 2005; Kagan, 1997).

The present study is a replication and extension of Laptook et al. (2008) and seeks to test the hypothesis that low PE and high BI reflect distinct patterns of motivation as indicated by differences in their eliciting contexts. Based on our preliminary study with 100 children, we hypothesized that higher levels of BI and lower levels of PA would both be associated with low approach in novel situations, but only lower levels of PA would be associated with low approach in non-novel contexts. We tested these hypotheses in a new and much larger community sample of 559 preschool-age children using a comprehensive battery of laboratory temperament/behavior measures. Furthermore, we extended our previous study by examining whether laboratory-assessed low PA and BI are associated with differences in parent/teacher-reports of related traits. We hypothesized that laboratory-assessed PA would be associated with external PA-related variables but not with BI-related variables, and that laboratory-assessed BI would be associated with external BI-related variables but not with PA-related variables.

Method

Participants

Participants included 559 children (54% male; 46% female) from a suburban community. Mean age was 42.2 months (*SD* = 3.1). Mean age for mothers was 36.0 years (*SD* = 4.4) and fathers was 38.3 years (*SD* = 5.3). Participants were recruited via a commercial mailing list. Eligible families had a child between three and four years of age, with no significant medical conditions or developmental disabilities, and at least one English-speaking biological parent. Participants were 87.1% Caucasian and came from mainly middle-class families, as measured by the Hollingshead's Four Factor Index of Social Status (Hollingshead, 1975; *M*=54.2; *SD=11*). The vast majority (94.2%) of children came from two-parent homes, and 51.4% of mothers worked outside the home part- or full-time. Children's mean scores on the Peabody Picture Vocabulary Test (*M* = 102.8, *SD* = 14) (PPVT; Dunn & Dunn, 1997) were in the average range.

Procedure

The study consisted of a two and a half hour visit that included participation in a structured laboratory observation of child temperament and behavior. The primary caregiver who accompanied the child completed a set of questionnaires. Most respondents were mothers (530 mothers; 25 fathers). The parent worked on the questionnaire packet during the visit but was allowed to finish uncompleted forms at home and mail them back. Parents gave consent (*N* = 397) to contact preschool/daycare teachers and send them questionnaires; 229 teachers (57.7%) returned questionnaires. Participants were compensated monetarily for participation.

Assessment Procedures

Laboratory Temperament Assessment—The child participated in a standardized set of twelve episodes from the Laboratory Temperament Assessment Battery (Lab-TAB; Goldsmith, Reilly, Lemery, Longley, & Prescott, 1995). Episodes were designed to elicit different behaviors and emotions. The child returned to a neutral state after each episode by taking a short play break. Each episode was videotaped through a one-way mirror and later coded. A parent remained in the room except during Stranger Approach and Box Empty. Below is a description of each episode:

Risk Room—Child explored a set of novel and ambiguous stimuli (e.g. cloth tunnel, balance beam, Halloween mask, etc.).

Tower of Patience—Child and experimenter alternated turns building a tower with large blocks. During each turn, the experimenter increased delays in adding her block.

Arc of Toys—Child was allowed to play with toys for a few minutes, after which the experimenter asked the child to clean up.

Stranger Approach—While the experimenter went to get toys, a male research assistant entered the room and spoke in a neutral tone while gradually walking closer to the child.

Car Go—Child and experimenter raced remote controlled cars.

Transparent Box—Child selected a toy, which was then locked in a transparent box. Child was left alone in the room with a set of incorrect keys. After a few minutes, the experimenter returned with the correct key, and encouraged the child to open the box and play.

Exploring New Objects—Child explored a set of novel/ambiguous stimuli, including a mechanical spider, mechanical bird, and sticky water-filled gel balls.

Pop-up Snakes—Child and experimenter surprised the mother with a can of potato chips that contained coiled toy snakes.

Impossibly Perfect Green Circles—Child was instructed to repeatedly draw a circle on a large paper. After each drawing, the circle was mildly criticized.

Popping Bubbles—Child and experimenter played with a bubble-shooting toy.

Snack Delay—Child was instructed to wait for the experimenter to ring a bell before eating a snack. Experimenter systematically delayed ringing the bell.

Box Empty—Child was given a present to unwrap, with nothing inside. After discovering the box was empty, the experimenter returned with several small toys for the child to keep.

Although all episodes were somewhat novel in that they took place in an unfamiliar laboratory setting, only three (i.e., Risk Room, Stranger Approach, Exploring New Objects) were explicitly designed to elicit wariness, hesitancy, and fear. These episodes, similar to episodes used in most laboratory studies of BI (Kagan, 1997; Pfeifer et al., 2002), were included as novel situations for this study. The remaining 9 episodes, similar to situations that young children frequently participate in, were characterized as non-novel.

Tape Coding Procedures—Coding procedures were based on previous studies (Durbin et al., 2005; Pfeifer et al., 2002). Different methods were employed for BI, PA, and behavior variables. These codes have been related to independent home observations and show moderate stability over time (Durbin, Hayden, Klein, & Olino, 2007).

Following Pfeifer et al. (2002) and Durbin et al (2005), we assessed BI by coding highly specific behaviors and emotions at 20-30 second intervals for each episode. Summary variables were computed for each variable by computing average ratings over the entire episode. Aggregate variables were then computed as averages across all episodes that coded that variable.

Because, by definition, BI should only be evident in novel contexts, variables used to measure BI were only assessed and coded during the three novel episodes. From Risk Room and Exploring New Objects, these variables included latency to touch objects, total number of objects touched, tentative play, references and proximity to parent, references to experimenter, time spent playing, and latency to verbalize. From Exploring New Objects, a startle variable was included. From Stranger Approach, variables included gaze aversion, latency to vocalize, approach to/avoidance of stranger, and verbal/nonverbal interaction with stranger. Variables included from all novel episodes consisted of fearful facial, vocal, bodily affect, and latency to first fear response. The micro BI scale was comprised of an average of z-scored codes ($\alpha = .80$; ICC = .88, $N = 28$) from the three novel episodes.

Following Durbin et al. (2005), ratings of PA considered qualitative and quantitative aspects of displays of joy and enthusiasm. Each instance of facial, vocal, and bodily PA was rated on a four-point scale and then summed across the episode. PA was coded during all 12 episodes, regardless of whether it was specifically designed to elicit it. This decision was based on the rationale that children may display PA in many contexts and not just those intended to elicit it. Ratings of bodily, facial, and vocal PA were each averaged across the 12 episodes. Next, averaged ratings of bodily, facial, and vocal PA were combined to yield a composite score of PA ($\alpha = .87$). Interrater ICC for PA was .92 ($N = 35$).

For behavior ratings, only a single rating was made per episode. This single rating was based on all behaviors thought to be relevant to each dimension during that episode. Variables on

which the constructs of PE and BI were hypothesized to overlap include activity, interest/engagement, and sociability. Global activity ratings (α = .73) were based on quantity and quality of movement during each episode as well as the amount of vigor exhibited in the manipulation of stimuli. Global interest ratings (α = .68) were based on how engaged the child appeared in play. Global sociability ratings (α = .83) were based on quality and quantity of the child's attempts to engage and interact with the experimenter and parent. Interrater ICCs (*N* = 35) for activity, interest, and sociability were .84, .75, and .83, respectively. Z-scored ratings of each variable were summed to form a composite behavioral approach scale for novel episodes (α = .71) and non-novel episodes (α = .80).

Children's Behavior Questionnaire (CBQ)—The CBQ (Rothbart, Ahadi, Hersey, & Fisher, 2001) is a 194-item caregiver report measure of temperament for three to seven-year-old children. The primary caregiver rates the child's behavior within the past six months on a seven-point scale. Scales used in the present analyses included fear (12 items; α = .74), shyness (13 items; α = .92), and smiling/laughter (13 items; α = .73).

Children's Reaction Scale (CRS)—The CRS (Eisenberg et al., 1996) is a 19-item measure of children's emotional responses. Each item is rated on a seven-point scale. The CRS was completed by both the primary caregiver and teacher. Coefficient alphas from the positive emotions (6 items) and negative emotions (5 items) scales of the parent form were .80 and .70, respectively. From the teacher form, coefficient alphas were .84 for the positive scale and .75 for the negative scale.

Data Analysis

The first set of analyses used only variables assessed in the Lab-TAB. To eliminate overlap between variables, PE was defined solely by positive affect (PA), and BI was defined using specific behaviors derived from previous research (see list of variables above) (Kagan, 1997; Pfeifer et al., 2002). Behavioral approach was defined using variables on which the constructs of PE and BI are hypothesized to overlap: activity, interest, and sociability. While PA has generally been conceptualized dimensionally (Clark & Watson, 1999), BI is often conceptualized categorically (Kagan, 1997). Hence, PA and BI were examined using both approaches. Zero-order correlations and two-tailed significance tests were used for the dimensional analysis to examine associations with behavioral approach. The magnitude of correlations was compared using Meng's procedure (Meng, Rosenthal, & Rubin, 1992), and, given our strong directional hypotheses, one-tailed tests of significance were used. For the categorical analysis, we compared the three groups (low PA, high BI, comparison) on levels of behavioral approach using one-way analysis of variance (ANOVA). Significant omnibus effects were followed with Newman-Keuls pairwise comparisons between the three pairs of groups. All tests were two-tailed. Children who scored in the lowest 25% of the sample on PA (*N* = 98; range = -.1710 - .5357) were included in the low PA group. Children in the highest 25% on BI (*N* = 98; range = .1829 - 2.0000) were included in the high BI group. The comparison group (*N* = 93) consisted of those children who fell within both the middle 40% of PA (range = -0.4469 - 0.3606) and the middle 40% of BI (range = -.2271 - .1310). Extreme groups at opposite poles of the constructs (i.e., high PA and low BI) were excluded. In creating distinct groups of children, those who met criteria for both low PA and high BI (*N* = 42) were also excluded.

The second set of analyses extended findings from the preliminary study by determining whether laboratory-defined low PA and high BI could also be distinguished by parent and teacher reports of temperament. Dimensional and categorical analyses were conducted as described above.

Results

Laboratory Differentiation of PA and BI

Dimensional Analyses—The zero-order correlation between PA and BI was not significant (*r[557]* = -.08, $p > .05$). As expected, in novel situations, both PA (*r[554]* = .46, $p < .001$) and BI (*r[554]* = -.47, $p < .001$) were significantly associated with approach, with more BI and lower PA associated with lower approach. For the r − Z transformations, the sign for PA was reversed so that both positive affect and BI were scored in the same direction, although the original non-reversed correlations are reported here. There was no significant difference between the correlation coefficients, Z = -.21, $p > .05$.

In non-novel situations, both PA and BI were significantly correlated with behavioral approach. However, the correlation between PA and approach (*r[554]* = .67, $p \leq .001$) was significantly larger than that between BI and approach (*r[554]* = -.19, $p \leq .001$), Z = 10.10, $p \leq .001$.

Categorical Analyses—One-way ANOVAs revealed significant differences between groups for both novel and non-novel contexts (see Table 1). For novel situations, children in both the high BI and low PA groups exhibited significantly lower behavioral approach than children in the comparison group. However, there was no significant difference between low PA and high BI groups.

In non-novel situations, children in the low PA group exhibited significantly lower levels of approach than children in both the comparison and high BI groups. However, the comparison and high BI groups did not differ.

External Measures of Temperament

Dimensional Analyses—To examine the relationship between laboratory ratings of low PA and high BI with external measures of temperament, zero-order correlations and the magnitude of their differences were examined (see Table 2).

Children's Behavior Questionnaire (CBQ)—Only BI was significantly associated with fear. Both lower PA and higher BI were significantly associated with shyness; however, the correlation between BI and shyness was significantly larger than the correlation between PA and shyness. Both higher PA and lower BI were associated with more smiling/laughter, with no significant difference between the correlation coefficients.

Children's Reaction Scale (CRS)—Contrary to expectations, only BI was significantly associated with parent ratings of positive emotions, with more BI related to less positive reactions. Greater BI was also associated with higher parent ratings of negative reactions. Both PA and BI were differentially associated with teacher ratings of positive emotions. Neither PA nor BI was significantly associated with teacher ratings of negative emotions.

Categorical Analyses—One-way ANOVAs revealed significant group differences on the CBQ-fear, and teacher-rated CRS-positive reactions and CRS-negative reactions scales (Table 3). Pairwise comparisons indicated that children in the high BI group exhibited a significantly higher level of fearfulness on the CBQ fear scale than the children in the comparison and low PA groups. Children in the low PA and comparison groups did not differ on the CBQ fear scale. Teacher ratings on the CRS positive scale revealed that children in the low PA group exhibited a significantly lower level of positive emotions than children in the high BI group, but neither of these groups differed from the children in the comparison group. On the teacher CRS negative scale, children in the high BI group exhibited significantly more negative reactions than children in both the comparison and low PA groups. The low PA and comparison

groups did not differ on the teacher ratings of negative emotions. There were no significant omnibus effects for the CBQ shyness scale, $F[2, 271] = 2.05$, $p > .05$, the CBQ smiling/laughter scale, $F[2, 266] = .15$, $p > .05$, the CRS parent positive scale, $F[2,247] = .68$, $p > .05$, or the CRS parent negative scale, $F[2, 247] = 1.80$, $p > .05$.

Discussion

The present study had two aims. First, using a much larger, independent sample, we sought to replicate our previous study (Laptook et al., 2008) demonstrating that although low approach is common to both low PE and high BI, specific contextual factors determine whether children with these traits engage in approach behaviors. Second, we extended our study by determining whether laboratory-assessed low PA and high BI could be distinguished by parent and teacher-reports of temperament.

Similar to Laptook et al. (2008), we found that low PA and high BI can be differentiated in a laboratory setting. Findings were similar using dimensional and categorical approaches to conceptualizing these temperament traits. In novel situations, both PA and BI were similarly associated with behavioral approach. However, in non-novel situations, the association between low PA and low approach was significantly greater than the association between high BI and low approach. These findings highlight the difficulty of distinguishing high BI from low PA in unfamiliar environments. However, in non-novel contexts, children with low PA continue to exhibit low approach, whereas children with high BI appear similar in approach behavior to controls.

We also examined associations of PA and BI with theoretically relevant parent- and teacher-reported temperament variables. Categorical and dimensional analyses yielded roughly similar patterns of results, although findings tended to be stronger with the latter, probably due to their greater power. Considering the dimensional analyses, higher BI was related to greater parent-reported fear, shyness, and negative emotions. Moreover, the magnitude of each of these associations was significantly greater than the correlations between PA and these variables. We also found that BI was associated with lower levels of parent-reported smiling/laughter and parent- and teacher-reported positive emotions. While this was unanticipated, it was not entirely surprising as fear and positive affect are relatively incompatible responses. However, one would expect these associations to be influenced by context, with BI more negatively correlated with positive affect in novel or threatening situations. Unfortunately, standard parent/teacher-report measures do not provide context-specific assessments of emotions and behavior, hence we cannot pursue this hypothesis with the present data.

Consistent with our hypotheses, lower PA was related to less parent-reported smiling/laughter and less teacher-reported positive emotions, although the correlation with parent-reported positive emotions was not significant. PA was also negatively related to parent-reported shyness. Although shyness is a core component of BI, it is also negatively associated with sociability, which is a facet of PE.

This study adds to the growing evidence indicating that BI and PA are independent dimensions, rather than opposite poles of a single construct (Polak-Toste & Gunnar, 2006; Putnam & Stifter, 2005). Moreover, these data underscore the fact that phenotypically similar behaviors may have different meanings and serve different functions in different contexts (e.g., Durbin et al., 2005).

This study had several strengths, including examining the internal construct validity of BI and low PA in a large sample using standardized laboratory tasks, and comparing these traits to theoretically relevant external variables. There were also several limitations, including the largely demographically homogenous sample, the lack of teacher data for many children, and

our inability to examine the stability or predictive validity of the distinction between low PA and high BI. Including other measures, such as home/school observations and physiological/biological variables, may also be useful in clarifying the distinction between these overlapping temperament constructs.

Summary

This study supports the validity of the distinction between low PA and BI using both laboratory and parent- and teacher-report measures. The somewhat weaker findings using parent- and teacher-reports may reflect the fact that these questionnaires rarely specify the context of the behaviors being rated. In addition, parents and teachers may have difficulty discriminating between these temperament traits, especially in preschoolers. Discrimination may improve as children develop and opportunities to observe them in varying contexts increase.

Overall, results suggest that low PA and high BI reflect different motivational systems and should be treated as independent dimensions that likely have different developmental influences, trajectories, and associations. Awareness of these distinctions may facilitate parents' and teachers' abilities to tailor their interaction styles to the individual needs of each child.

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References

Clark, LA.; Watson, D. Temperament: A new paradigm for trait psychology. In: Pervin, LA.; John, OP., editors. Handbook of personality: Theory and research. 2nd. New York: Guilford Press; 1999.

Dunn, LM.; Dunn, LM. Peabody Picture Vocabulary Test. 3rd. Circle Pines, Minnesota: American Guidance Service; 1997.

Durbin CE, Hayden EP, Klein DN, Olino TM. Stability of laboratory-assessed temperamental emotionality traits from ages 3 to 7. Emotion 2007;7:388–399. [PubMed: 17516816]

Durbin CE, Klein DN, Hayden EP, Buckley ME, Moerk KC. Temperamental emotionality in preschoolers and parental mood disorders. Journal of Abnormal Psychology 2005;114:28–37. [PubMed: 15709809]

Eisenberg N, Fabes RA, Guthrie IK, Murphy BC, Maszk P, Holmgren R, Suh K. The relations of regulation and emotionality to problem behavior in elementary school children. Development and Psychopathology 1996;8:141–162.

Fox NA, Henderson HA, Marshall PJ, Nichols KE, Ghera MM. Behavioral inhibition: Linking biology and behavior within a developmental framework. Annual Review of Psychiatry 2005;56:235–262.

Gest SD. Behavioral inhibition: Stability and associations with adaptation from childhood to early adulthood. Journal of Personality and Social Psychology 1997;72:467–475. [PubMed: 9107012]

Goldsmith, HH.; Reilly, J.; Lemery, KS.; Longley, S.; Prescott, A. Laboratory Temperament Assessment Battery: Preschool version. 1995. Unpublished manuscript

Hirshfeld-Becker DR, Micco J, Henin A, Bloomfield A, Biederman J, Rosenbaum J. Behavioral inhibition. Depression and Anxiety 2008;25:357–367. [PubMed: 18412062]

Hollingshead, AB. Four factor index of social status. 1975. Unpublished manuscript

Kagan J. Temperament and the reactions to unfamiliarity. Child Development 1997;68:139–143. [PubMed: 9084130]

Kagan J, Snidman N, Arcus D. Childhood derivatives of high and low reactivity in infancy. Child Development 1998;69:1483–1493. [PubMed: 9914634]

Laptook RS, Klein DN, Durbin CE, Hayden EP, Olino TM, Carlson G. Differentiation between low positive affectivity and behavioral inhibition in preschool-age children: A comparison of behavioral

approach in novel and non-novel contexts. Journal of Personality and Individual Differences 2008;44:758–767.

Meng XL, Rosenthal R, Rubin DB. Comparing correlated correlation coefficients. Psychological Bulletin 1992;111:172–175.

Pfeifer M, Goldsmith HH, Davidson RJ, Rickman M. Continuity and change in inhibited and uninhibited children. Child Development 2002;73:1474–1485. [PubMed: 12361313]

Polak-Toste, CP.; Gunnar, MR. Temperamental exuberance: Correlates and consequences. In: Marshall, Peter J.; Fox, Nathan A., editors. The Development of Social Engagement: Neurobiological Perspectives. New York: Oxford University Press; 2006.

Putnam SP, Stifter CA. Behavioral approach-inhibition in toddlers: Prediction from infancy, positive and negative components, and relations with behavior problems. Child Development 2005;76:212–226. [PubMed: 15693768]

Rothbart MK, Ahadi SA, Hersey KL, Fisher P. Investigations of temperament at three to seven years: The Children's Behavior Questionnaire. Child Development 2001;72:1394–1408. [PubMed: 11699677]

Rothbart, MK.; Bates, JE. Temperament in children's development. In: Eisenberg, N.; Damon, W.; Lerner, RM., editors. Handbook of Child Psychology, sixth edition: Social, Emotional, and Personality Development. Vol. 3. New York: John Wiley & Sons; 2006. p. 99-166.

Table 1

Pairwise comparisons of the high BI, low PA, and comparison groups on behavioral approach in novel and non-novel situations

Behavioral approach	BI	Low PA	Control	F
Novel situations *M*(*SD*)	-.74(2.37)[a]	-.71(2.06)[a]	.06(1.93)[b]	36.77***
Non-novel situations *M*(*SD*)	.54(2.08)[a]	-1.84(2.16)[b]	.03(1.85)[a]	4.31*

Note. Superscripts indicate differences at p≤ .05. BI = behavioral inhibition; PA = positive affectivity. Values are Z-scores.

*** $p < .001$.

* $p < .05$.

Novel situations df = (2, 284); Non-novel situations df = (2, 285).

Table 2

Correlations and magnitude of differences between laboratory PA and BI and external measures of temperament

	Positive affect	BI	Z
CBQ Fear (*N* = 524)	.05	.26***	5.33***
CBQ Shyness (*N* = 527)	-.13**	.23***	1.72*
CBQ Smiling/Laughter (*N* = 516)	.12**	-.14***	-.33
CRS Parent Positive (*N* = 478)	.06	-.11*	-.80
CRS Parent Negative (*N* = 478)	-.07	.17***	1.63*
CRS Teacher Positive (*N* = 228)	.28**	-.16**	1.38
CRS Teacher Negative (*N* = 227)	.06	.00	.66

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$.

BI = behavioral inhibition; PA = positive affectivity.

Table 3

Pairwise comparisons of the high BI, low PA, and comparison groups on variables from external measures of temperament

	BI	Low PA	Control	F
CBQ Fear *M*(*SD*)	4.29(.87)[a]	3.85(1.07)[b]	3.93(.90)[b]	5.57**
CRS Positive – teacher *M*(*SD*)	27.62(6.36)[a]	23.13(6.80)[b]	24.77(7.81)[ab]	3.95*
CRS Negative – teacher *M*(*SD*)	20.30(5.77)[a]	15.95(5.00)[b]	16.64(6.27)[b]	6.28**

Note. Superscripts indicate differences at $p \leq .05$.

** $p \leq .01$.

* $p \leq .05$.

BI = behavioral inhibition; PA = positive affectivity. CBQ = Children's Behavior Questionnaire (Rothbart, Ahadi, Hersey, & Fisher, 2001); CRS = Children's Reactions Scale (Eisenberg et al., 1996). CBQ Fear df = (2, 270); CRS Positive – teacher df = (2, 112); CRS Negative - teacher df = (2, 111).